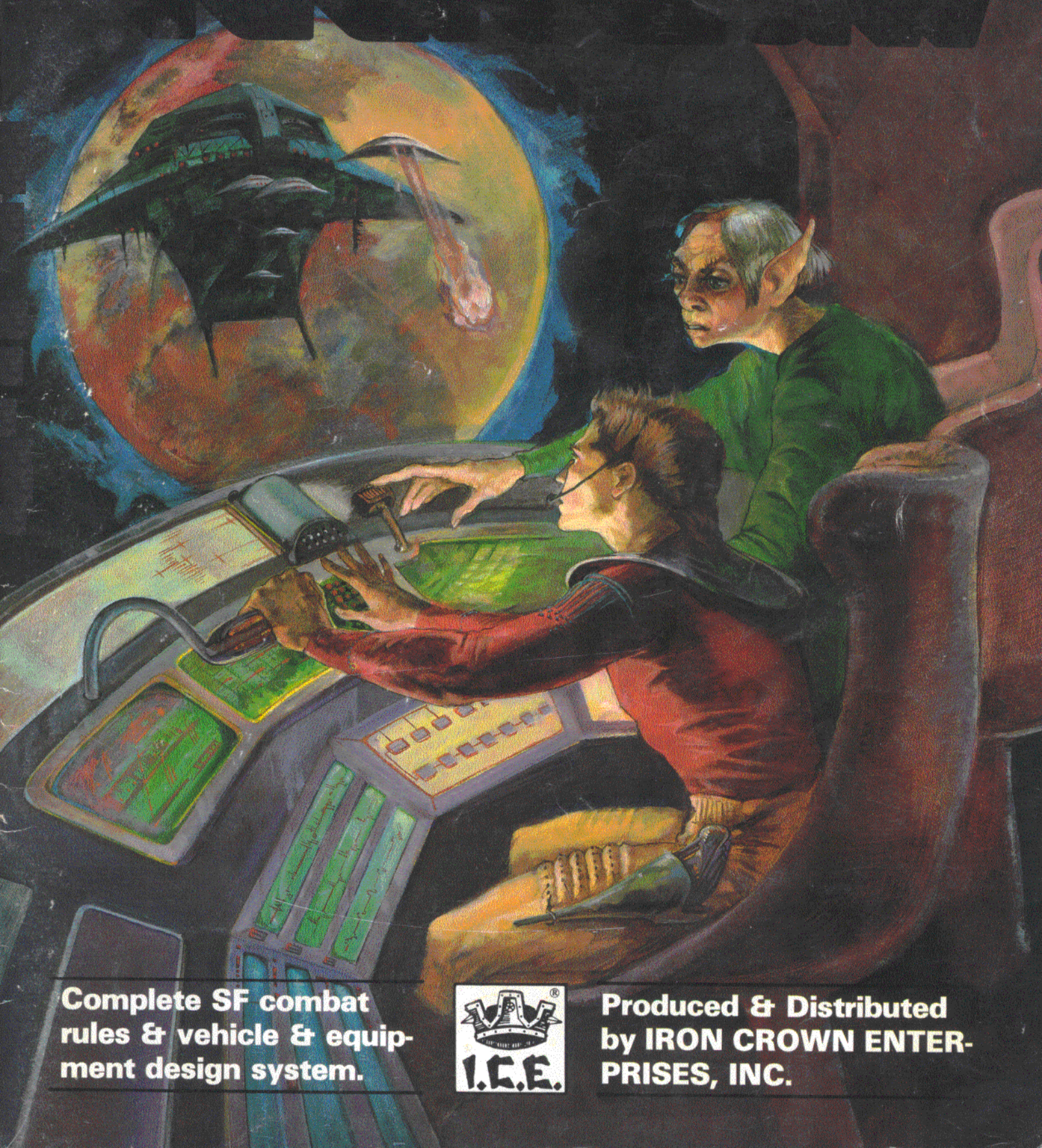


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TECH LAWTM

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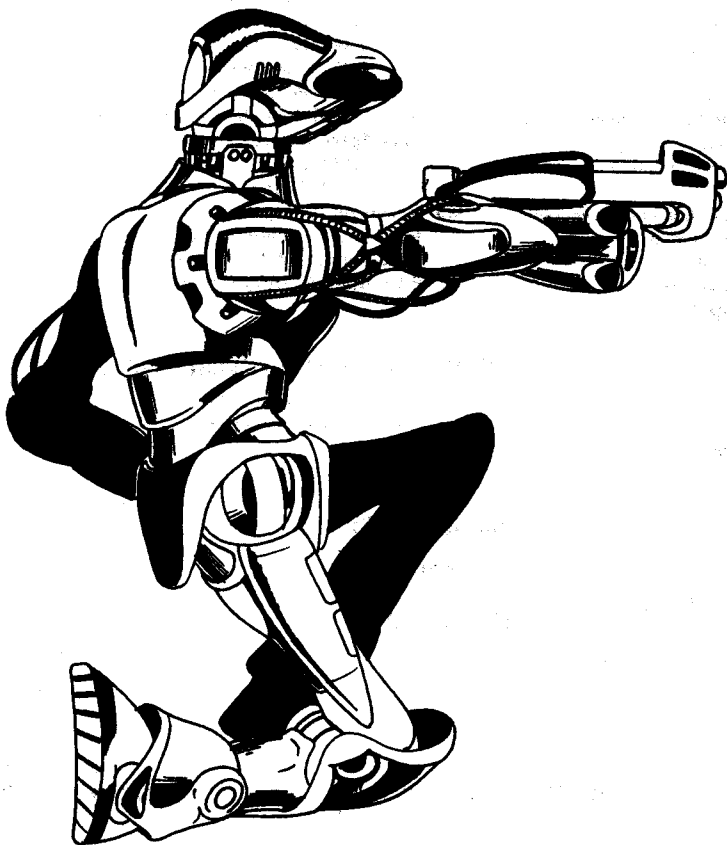
1.0 INTRODUCTION

This booklet is **Tech Law**, a Science-fiction Role Playing supplement produced by Iron Crown Enterprises. It encompasses all types of Combat in a Science-fiction environment, from personal energy and projectile weapons to Starship laser and disruptor banks. **Tech Law** also contains rules for the custom design of spacecraft, all types of smaller vehicles, robots, androids, and living organisms. Selected 'standard' designs of all of these are also included, along with complete price tables for everything from Starships to pocket communicators.

Attack and critical tables to cover dozens of modern and future weapons can be found here, as well as personal equipment, armor and energy shields, and complete rules covering personal maneuvering and combat, all types of vehicular combat, and two types of spacecraft warfare.

A general glossary is located in the back of the book, defining terms used throughout **Tech Law**. Short 'sub-glossaries' begin most sections where there is additional, specialized terminology. The index includes section topics and key charts, to hopefully minimize tedious flipping for reference. Charts appropriate for each section are grouped at the end of the section whenever possible. Critical Chart pages are tinted grey for quick location. All of the worksheets, as well as the ship and combat status charts, may be photocopied for personal use.

Tech Law, when used with its companion book, **Future Law**, is a complete SF Role Playing system. It can also be utilized as a SF supplement to **Rolemaster**, **Middle-earth Role-Playing** (for the bold) or many Science-fiction Role-Playing systems.



2.0 THE TECHNOLOGIES OF SPACE MASTER

The universe of **Space Master** is the far future, where technologies have achieved in reality what can only be guessed as possible today. A brief framework of the "current" state of such technology may be helpful in understanding many assumptions and assertions in other parts of this book. **Future Law**, the companion volume, deals with levels of technology in more detail, and offers possibilities of societies where certain aspects of science have leapt ahead, where others have either fallen into latency or were held back for various reasons. Power sources in **Space Master** — as well as several other elements which bear explanation — are discussed in detail later in this section.

2.1 TIMELINE OF TECHNOLOGY

Below are listed a series of key achievements in Science and Technology, followed by a more complete commentary on the rationale of state-of-the-art technology in **Space Master**. (Included in parentheses between technological breakthrough entries are pertinent general comments on sociological activities).

Vacuum Tubes: The infancy of electronics.

Fission Nuclear Power: Heavy atoms split to create heat energy, converted to electricity with steam-driven turbines.

Transistor Electronics: Vacuum tubes are replaced by (relatively) compact circuits. First crude computers are constructed.

Microchip Electronics: Silicon chips — vastly more compact and inexpensive than transistors — spread technology.

Sentient Cloning: Successful cloning of a human being is achieved. No memories are carried over, however. Laws banning cloning for "spare organs" limit the practice.

Controlled Fusion Power: Advancing laser and electromagnetic technologies make fusion power generation practical. A renaissance of inexpensive electrical power ensues.

(Much of the solar system is colonized.)

Cryogenic Hybernation: Control of human physiological functions to put sentients into cryogenic sleep perfected.

(Large, orbiting space colonies constructed. Many interstellar ships manned by crews in cryogenic sleep are launched into space.)

Superconductors: Superconductive materials are synthesized, opening doors to other avenues of advancement.

Thermoelectric Power Conversion: One development as a result of superconductor technology, electric power can be generated directly from heat energy, bypassing bulky and inefficient steam turbine systems in reactors. Microfusion reactors are soon developed.

Molecular Data Storage: The precursor to Molecutronics, this system stores information by a method (similar to the human brain) hundreds of times more efficient and compact than magnetic databanks.

Sentient Alterant Replication: Relaxing of genetic control laws allows for experimentation. Several societies practice controlled breeding. Alteration of fetuses on a chromosomal level is done successfully, allowing creation of beings "pre-designed" to certain professions or tasks. Such activities remain restricted, however.

Gravitic Field Control: The force of gravity is mastered. Fields which can annul or mimic it are produced cheaply.

Molecular Electronics: After many failures, living circuitry is created, and can be reproduced ("grown") very inexpensively. Molecutronics is born.

Artificial Sentience (Android Construction): The natural followup to Molecutronics is the self-programming, "thinking" brain, placed in a mobile framework. Some true Androids are indistinguishable from living sentients without a scanning device.

Relative Inertial Field Suspension: The control of inertia and — by methods not completely understood — relativity opens the door to faster-than-light travel. Unfortunately, fusion power is not up to the task of a controlled hyperspace shunt. The door is ajar but no one can pass through.

Controlled Matter/Antimatter Power: The creation of andrium leads to the harnessing of the most powerful source of energy yet: the mutual annihilation of matter and antimatter. This energy is so great, however, that it is not feasible for use as a sublight ship propulsion system. However, the massive energies are ideal to shunt a craft into hyperspace.

Hyperspace Shunt: The technique is perfected, and the human race explodes across the galaxy.

2.2 ENERGY SOURCES IN THE TIME OF SPACE MASTER

Three basic types of energy-generation are considered in **Space Master**. They are: Fission, or the splitting of heavy atoms and tapping the released heat energy; Fusion, or the joining of two atoms to form another (the power source of suns); and Matter/Antimatter, where Antimatter is allowed to come into contact with matter in limited quantities, at which point they annihilate each other.

Fission: Heat energy created from the splitting of heavy atoms such as Uranium and Plutonium. Dangerous radiation is associated with this form of energy, though modern alloys can shield most such radiation. Fuel is in the form of pellets of heavy material, such as Uranium and Plutonium. These pellets are held in fuel 'rods'.

Fusion: A much cleaner source of power, many sublight ships use fusion reactors, which generate heat from the joining of two hydrogen atoms to form a helium atom. This process releases a tremendous amount of relatively 'clean' (radiation-free) thermal energy. The heat to cause the fusion reaction is in most cases created by banks of high-intensity lasers — the most compact and efficient method under **Space Master** technology. Small, portable reactors are most often fusion in nature, both because of the ease of acquiring fuel and their relatively simple design and safe operation.

Matter/Antimatter: This type of reactor is the most powerful and efficient by far — though initially the most expensive. By the time of **Space Master**, however, it is the predominant method aboard advanced spacecraft, which require — more than any other application — large quantities of power from a limited volume. The fuel utilized in the vast majority of M/A reactors and engines is a specific type of dense antimatter. When matter and antimatter are combined to fuel a reactor or engine, electromagnetic fields of incredible force are needed to contain or direct the energies thus unleashed, fields many times more powerful than those needed to contain fusion reactions.

Antimatter is collected by bombarding certain atoms with specific types of radiation which strips away — via a fission process — the protective nucleus isolating the antimatter subatomic elements. The initial fissioning generates intense radiation: the only dangerous radiation in the process. Thus exposed, the antimatter elements are ready to be combined with normal matter to create the annihilation. Ships are fueled with the material while it is still 'neutral' — the antimatter is safe within the subatomic field. The ship reactor or engine "strips" the atoms then triggers the controlled annihilation.

Antimatter is, of course, a highly volatile material, since its coming into contact with any normal matter will cause it to utterly and violently destroy as much of that matter as is equal to its own mass. For this reason, 'hot' antimatter is stored at all times in electromagnetic 'bottles', held separate from any matter. While so stored, the energy to hold the antimatter suspended is relatively low. For items like M/A Torpedoes, the antimatter is pre-stripped and tapped into a storage bottle in the torpedo.

The technology level assumed in **Space Master** is capable of full control of matter-antimatter annihilation, a power source with potential far beyond fission or even fusion. However, as has always been true in the past, M/A reactors are the most costly as an initial investment, due to their necessary sophistication. Fuel is also a cost consideration. Antimatter might not even be available in many areas, where Technic development has lagged behind. In addition, it is quite possible for a ship to have M/A translight engines while having a fusion reactor, as engine design is much less complex. Indeed, truly effective translight travel is not possible without M/A, since only the raw power released by destruction of matter can shunt a craft into hyperspace at a velocity which makes frequent interstellar travel feasible.

All state-of-technology reactors in **Space Master** utilize thermoelectric conversion to adapt the tremendous heat energy into more usable electrical power; a far more compact and efficient method than the immensely crude steam turbines used on pre-starflight Terra.

2.3 OTHER SYSTEMS

This section touches briefly on several elements of Technic development in **Space Master** which pervade many aspects of the life of an adventurer.

2.3.1 SENSORS

The term **Sensor** in **Space Master** is actually a bastardization of the acronym: SENSR (Selected Electromagnetic/ Neutrino-Stream Reflection). This all-encompassing title refers to a system used by nearly all sophisticated sensing systems from Multiscanners to starship sensor banks. The power and flexibility of Sensors far exceeds such early analysis tools as spectroscopy and gravitic scans, being able to bombard a target area with selectively treated, hyperlight-accelerated neutrino beams (which have no mass and can thus travel at hyperlight speeds). Depending on their 'treatment' (a temporary electromagnetic or gravitic charge) and whether they return to the sensing device, the neutrino beams provide data on the nature of the target in great detail. Neutrino beams are completely harmless and almost undetectable, and they can pass through almost unlimited amounts of intervening matter if desired, to reach the scan target. The results are almost instantaneous.

Sensor range is dependent almost exclusively on the power of the sensing device itself, although there is inevitable distortion beyond about 50 light-years. Beyond about one light-year detailed analysis is limited; however, it is accurate enough at this range for a ship to plot a reasonably safe Hyperspace shunt. Analysis under one-LY range is extremely useful to ships as they drop out of hyperspace near a star system and require a swift, complete analysis. Such a study using speed-of-light analysis beams would take hours, if not days.

2.3.2 ELECTRONIC WARFARE/STEALTH

Developed in its earliest forms almost immediately after the invention of the Sensor, the Stealth Field (as it is often called), absorbs, attracts or distorts the treated neutrinos sent out by sensor beams, thus making it appear as if there were nothing there to detect. The field does the same with other radiations — including visible light — so that the craft or object surrounded by a Stealth Field reflects no radiation. Of course, the field is not perfect, and there is an in-

inevitable warping around the craft. Because of this there are EW/Stealth operators who monitor and manipulate the field to enhance its effectiveness.

The Stealth field has a myriad of uses in warfare. For instance, the field can be extended out from the ship in such a manner that it can 'fool' incoming missile tracking system into believing that the ship is much closer than it really is, thus triggering the missile proximity fuse. For more details on EW/Stealth, see section 6.2.

2.33 COMMUNICATION

With the advent of relatively easy interstellar travel, 'swift' communication among the suddenly far-flung colonies of Terra became a problem. People could physically travel from one point to another more quickly than a message could be sent via any known electronic method. Curiously, the resulting effect was similar to (though on a much larger scale) medieval Europe existing on Terra. The concept of an effective centralized government was unfeasible because of the delay in communication. It might take days, sometimes weeks, to get a message across.

The Tachion Beam Dictor has helped to alleviate the problem, but is far from the perfect solution. The Dictor utilizes tachion beams (more stable over a long range than neutrinos) to transmit information. The dictor has an effective range of about 30 light-years, and this creates the necessity for a message to be relayed several times if it has a long way to travel. This creates serious security problems for sensitive information. An additional drawback is that the beam must be very carefully aimed, and so useful Dictors must be located on installations with very predictable movements, such as orbiting space stations (the beam does not travel well through planetary atmospheres either; standard laser transmission is used for ground to orbit communication). Dictors can also be used between ships if each has a sensor-lock on the other, so that the beam may be properly aimed. This allows for instantaneous communication between ships which may be across a solar system from each other, where a laser transmission would take hours to be received.

3.0 MACHINES

Included in this section are all types of machines, from personal communicators to blaster rifles to starships. The machines described here are more-or-less "stock" devices, ready made and relatively available (dependent of course upon local technic level and economy).

The monetary unit employed throughout is the Elmonit. This actually means "Electronic Monit", a unit of value which never changes throughout civilized space. The Monit is theoretically equivalent, but is allowed to increase or decrease in value on a local level in relation to the Elmonit, to reflect local economic conditions. "Local" in this context is usually defined as "planetary" or, at least "continental".

3.1 EQUIPMENT AND WEAPONS

Below is a list of equipment and weapons which might be useful to an adventurer in *Space Master*. Following the descriptions is a cost and weight chart (3.12).

3.11 DESCRIPTIONS

Note: Items marked with an asterisk (*) use a standard energy cell, about the diameter of a dime and slightly thicker. The cells are rechargeable and provide approx. 100 hrs of continuous operation. Some items may require more than one cell. Other items require special, larger power packs; these packs are detailed separately.

3.111 Hand Weapons

Following are brief descriptions of personal hand weapons and (relatively) lightweight portable weapons commonly available. Unless otherwise noted, they are constructed of a high tensile strength, lightweight alloy, non-corroding and more durable than steel. See the end of the weapons list for ammunition notes. Also, keep in mind that it is very likely that many of these devices would be restricted or unavailable to the general public — especially atomic and Matter/Antimatter (M/A) explosives. Descriptions of ammunition and power packs are at the end of the section, along with all power packs and other **Accessories**.

Projectile Weapons

7mm Automatic: Snub-nosed pistol (also referred to as .32 calibre).

11mm Automatic: Larger, more accurate and powerful projectile pistol. Also called a .45 calibre.

5mm Body Pistol: Similar to the 7mm automatic except that it is even more compact. The pistol and its ammunition are fashioned of a non-metallic, glassitic material which does not register on standard metal detection (weapons) checks, or on even a multiscan.

10mm MLA Pistol: (Magnetic Linear Accelerator). An advancement over the explosive-projectile handgun, a *Linex* — Pistol — requires two standard-rating power cells, which operate a linear accelerator within the barrel, hurtling the projectile at a much faster rate than normal explosives are capable of. Linexes have rather long barrels (around 10cm) and are difficult to conceal.

3mm Needle Pistol: Fires a deadly spray of razor-sharp glassteel needles. Especially effective against unarmored foes.

5mm Rifle: Standard model.

10mm Heavy Rifle: Even less subtle than the preceeding weapon.

Light Assault Rifle: The gun can be set to fire bursts of five rounds, or individual shots.

7mm Rocket Rifle: Similar in appearance to the Assault Rifle, this weapon is designed to fire 7mm self-powered 'rocket' shells. These greatly improve the gun's effective range.

9mm SMG: (Small machine Gun) Another weapon very popular in the 20th century, an earlier, similar weapon (a submachine gun) was sold by the Uzi company, and the name has been gererically transferred to the gun itself. It is a semiautomatic weapon, firing bursts of five rounds. Users with an averaged Strength and Agility bonus of 20+ can use this gun one-handed at -30.

15mm MLA Rifle: The rifle version of the *Linex* Pistol (MLA) above. Note the relatively long ranges.

3mm Tangle Rifle: Mainly a police subdual weapon, it carries a bulky, one-shot cartridge of synthetic fibrous material which is liquid until it contacts with atmosphere. Like a strong spiderweb, it envelops the target, the webbing contracting and drying into an elastic, effective restraint. A sharp knife can cut free the prisoner after the material has dried. Use the **Envelop** Attack table from **Claw Law**, and the **Grapple** Critical table.

3mm Shotgun: Standard double barrel design.

3mm Flechette: Similar to a Shotgun, this weapon fires extremely sharp projectiles. It uses the *Slash* critical hit table.

6mm Autoshotgun: Fires as many as two bursts of five shots per round. At short range, the most deadly of the handheld automatic projectile weapons.

9mm LMG: (Light machine Gun) Portable, though requiring a tripod for full effectiveness. The ammunition for this weapon is available in drum or belt form.

12mm HMG: (Heavy machine Gun) Stretching the concept of portable, this gun is the most powerful projectile automatic weapon available. It must be tripod-mounted to be used; all equipment requiring at least two people to carry.

Energy Weapons

Hand Laser: A very small, concealable laser, about the size of a flat cigarette pack. Rather than the more bulky weapons energy cartridge, it uses two standard flat cells, thus sacrificing power and range for its small size.

Laser Pistol: The standard throughout Civilized Space, utilizing powerful pulse-laser shots.

Laser Rifle: The same concept as the two smaller models, with extended power and range.

Medium (Semi-Portable) Laser: Generally tripod or vehicle-mounted, this weapon requires a portable power supply (normally a microfusion reactor) — battery cells are expended too quickly to be practical, usually within two or three shots.

Heavy Laser: Almost always vehicle mounted because of its bulk, this weapon is the most powerful of the portable lasers.

Blast Pistol: A less subtle and accurate weapon than the laser, it is outlawed on more civilized planets as 'barbaric' (like most projectile weapons) and is normally only used by the military or criminals. The Blaster fires energy bolts generated through a capacitance system in the gun.

Assault Blaster: Larger than a pistol yet more compact than a Blast Rifle, this weapon is very popular in the some circles. It can also be used one-handed (at -20) or some models can be set to rapid-fire (2-handed only) as many as two bursts per round. Use the Automatic Weapon Table, Mk. 3, substituting *Puncture* with *Impact* criticals. When used this way, there is an additional +5 chance of failure.

Blaster Rifle: Larger, more powerful and accurate version of the assault blaster.

Medium Blaster: Semi-Portable; can be used two-handed, though it is unwieldy.

Heavy Blaster: Tripod or vehicle mounted only. Can be set on rapid-fire (use Auto Mk. 5, as Assault Blaster above). Demands 5x the energy of its power plant. For instance, a Heavy Blaster on single shot can fire 2x a round, 10x a turn. At Mk. 5 it requires 50 ER (Energy Rating) units per turn for maximum fire opportunity. On rapid-fire, it needs 250 ER units. One might be shocked at the high energy demand, especially in comparison to more powerful ship-mounted weaponry, but keep in mind that this gun fires many more blasts and is not as efficient.

Contact Stunner: Palm-sized, this little device can deliver a tremendous shock to the target. The main disadvantage is that one must touch the target.

Hand Stunner: About the same size as a hand laser, this compact weapon also uses two standard power cells, and is designed to be easily concealed. Like all the Stunners, it fires a pulsed electrical charge, designed to deliver concussion hits and to incapacitate the target through neural overload.

Stun Pistol: Standard police issue, it is more powerful and accurate than the hand model.

Stun Rifle: A step up from the pistol. The most powerful weapon of its type, it is also useful against large animals.

Plasma Repeater Rifle: A truly devastating weapon, it is often vehicle or tripod mounted, but it is possible to use it two-handed (By those with an average Strength and Agility bonus of 20+ — and use it at -20). It packs its own high-output microfusion reactor (see *Accessories*). The Rifle actually more resembles a small bazooka, and can be fired from the shoulder or a hip sling. The Plasma rifle fires bolts of superheated matter at high velocity (accelerated by the cylindrical electromagnetic field). It uses the Blaster table (Mk. 5) on single shot; in addition to impact criticals, roll an additional *Radiation* crit of same severity (see 4.87). It can be set on rapid fire, but chance of failure is increased from 8 to 10. When rapid firing, use the Auto Mk. 5 chart, and employ *Radiation* criticals instead of impact. Truly terrifying at short range and against unarmored foes.

Flame Pistol: A curious weapon, being both unsubtle and ineffective at any great range. The pistol uses a cartridge good for four shots and fires on the **Spell Law** Firebolt table, 2x hit damage multipliers.

Flame Rifle: Slightly more powerful than the pistol, the rifle power pack holds eight shots and multiplies damage x4 on the Fire Bolt table.

Melee Hand Weapons

Force-knife: Basically a hilt (using a standard pistol power pack) with a dial control in the pommel. When activated a blade of pure force springs from the top end of the hilt, the length of which is controlled by the dial. Short Sword or dagger tables from **Arms Law** are recommended, with a bonus, and additional Heat or Electricity criticals.

Power Sword: Larger, more powerful version of the Force-knife, it is usually used two-handed, and delivers both *Slash* and *Burn* Critical hits. The sword is very destructive to inanimate objects as well, being able to cut through material as strong as steel with little trouble. Use **Arms Law** 2-h sword table, with slash and Heat criticals.

3.112 Support Weapons

Grenades

Conv. Explosive: Usually a chemical agent, it has a relatively small radius (up to 50m) but is useful for precision strikes.

Fusion: Blast radius is up to 5 km. Note that in addition to regular criticals, all targets receive a *Radiation* crit of one less severity. These are usually restricted.

Gas: Any of a variety of chemical or biological attacks; range varies with conditions but generally not over 100m radius.

Smoke: Harmless smoke reduces visibility to 3m; also reduces Laser dire one Mk. level per 10m range. 100m radius, dependent on conditions.

Glitter: ("Laser-Away") Designed to sabotage Laser and other light-related attacks, this fills a radius up to 200m with suspended glittering particles which reduce normal visibility only by 20 but reduce all Laser-like fire by one Mk. level per 10m travel through the glitter.

Mark I Grenade Launcher: Fires standard grenades (above) with an effective range of 1000 meters (1 km). Simple targeting equipment.

Mark III Rocket Launcher: Fires rockets with internal power system but not computer-guided. Range: 100 km w/ error margin 1 meter per km travelled. Electronic targeting but w/o strategic display.

Mark V Rocket Launcher: Basically a tube mounted on an adjustable stand with simple targeting controls and a luminous strategic display map. Map can be adjusted to be appropriate with rocket range. Launcher has built-in scanners to detect heat sources and power emanations up to 1000 km. distant. Targeting information is transferred to cruise rocket internal guidance systems. Error range 1 meter per 100 km travelled.

Guided Cruise Rockets: (1000 km range w/Mk. V launcher) These have destructive capability as the conventional explosives above, but are equipped with a microcomputer and cruise guidance system.

- Chemical Explosive rocket
- Fission Rocket
- Fusion Rocket
- M/A Rocket

Portable Laser Cannon: This 'portable' cannon is essentially the same as a 10 Mk ship-mounted cannon, set on a tripod equipped with computer targeting. Requires a portable Fusion reactor for power (a UM roll of 01-02 when using a Fusion pack to power any portable cannon indicates that the power supply is depleted). Weight: (not including Fusion Pack) 100 kg (220 lbs). It can be partially disassembled for carrying. Against humans use the Automatic Projectile Attack table, substituting Heat and Puncture criticals, and doubling hit damage from the attack table.

Portable Blaster Gun: An Mk. 10 Blaster similar to the Portable Laser Cannon. Weight: 120 kg (264 lbs).

Portable Disruptor Cannon: An Mk. 10 Disruptor cannon, less powerful but also not as fragile or bulky as a laser of comparable destructive output. Weight: 90 kg (198 lbs).

3.113 Personal Equipment

Chronometer: Fitted with a lifetime power cell, these wristwatch-like devices invariably perform several other tasks, including personal metabolic monitoring, limited audio recording, etc.

Infra-red Lenses: Contact lenses, wearable for up to a month without discomfort, which allow the wearer to 'see' into the infrared spectrum, allowing him to discern heat-radiating objects even in the dark. Activated by pupil dilation, they do not impede normal vision. Must be custom-fitted (included in price).

Infra-red Goggles: Less expensive than the lenses above, they perform basically the same function. They do, however, reduce wearer Perception by 20 (and it is obvious that one is wearing them, as opposed to the lenses, which are undetectable to the casual observer).

Light Filter Lenses: Similar to Infra-red Lenses, these are triggered by pupil constriction, darkening to cut glare when the wearer is in bright light. Must be custom-fitted (included in price).

Light Filter Goggles: As the Lenses above, but not as costly. They reduce Perception by 10.

Ultra Lenses: These combine the features of Infra-red and Light Filter lenses. Must be custom-fitted (included in price).

Ultra Goggles: Like the Lenses above, except these are less expensive, and reduce Perception by 20.

Earphone Communicator: (*) A lightweight headset, it mounts in one ear with a filament wire extending to just in front of the mouth, a tiny microphone mounted on the tip. The unit is very lightweight and unencumbering. Hearing, even through the unit, is unimpaired. Range: 100 m; also used on-board vehicles.

Pocket Communicator: (*) A small, cigarette-sized device designed for long-range audio communication (1000 km overland, or land to standard overhead orbit). It can be linked to a multiscanner to transmit coded information for more detailed shipboard analysis — though this is not 100% dependable (base - 01-02 roll indicates flawed transmission; may be worse dependent on conditions) over long distances, and can be time-consuming. The Pocket communicator has a wider range of frequencies than an earphone and has limited (25 hour) built-in recording capacity.

Distance Lenses: (*) About the size of a pair of small binoculars, these combine the powers of Infrared and Filter lenses, as well as superb magnification (up to 100,000x). A small display inside, along the edge of the view gives distance to an object targeted in crosshairs (up to 20 km).

Multiscanner: (*) An extremely useful device for explorer/adventurers, the multiscanner is the ultimate in portable analysis and detection instruments. Approx. 18 x 12 x 5 cm in size, the Multiscanner is often carried on a shoulderstrap. Readout is via a 2-D screen set on one side of the device, just above the control surfaces. The device is capable of three separate types of scan/analysis, as well as recording scan information for future, more detailed analysis by an onboard ship or land-based computer. It is also capable of normal audio-video recording. Information is stored on standard memory disks, 4 cm in diameter and 7 mm. thick, each capable of holding 10 hours of continuous full-spectrum scan (about 100 megabytes) in molecular memory. There is storage space in the bottom of the scanner for four disks in addition to the reader receptacle further up. Below is a summary of the scans which can be performed:

Life Types: Life form detection and distinction between animal and plantlife can be made at a distance of 1000 meters. At 200 meters individual animal life units can be discerned, and at 50 meters the scanner can make distinctions between basic types (humanoid vs lizard or bear, for instance). More detailed information must be gleaned using a Medscanner.

Power Emanations: This scan reveals any form of radiation, running the full spectrum from gamma to infrared, automatically screening out the usual background radiations (unless programmed to do otherwise). This is useful in detecting transmission sources, as well as any sort of energy generator. Range varies tremendously depending on the power/transmission, but an activated scanner could pick up an unshielded pocket communicator beam at a range of about 100 meters, while it could detect a large, operating fusion reactor from as far as 10 km. At 1/10th of detection range (again, somewhat variable, dependent on conditions and skill of scanner operator) specifics can be made out (interception of transmission, exact location and type of power generation).

Physical Analysis: By utilizing this setting, the operator may locate concentrations of a given substance — assuming the scanner already has in memory a previous scan or database readout of the substance with which to compare — of as little as one gram at 10 m. The progression is, conveniently, fairly even, so that a concentration of one kg of an element may be found as far as 10,000 meters (10 km) away.

Memory disks: For use with standard audio/visual playback and record devices. Each disk holds up to 100 hours of digitalized holovideo recording or 100 megabytes of coded data. They are 3cm in diameter and 5mm thick.

Memory Disk Viewer (portable): (*) Slightly larger than a standard multiscanner, the viewer has a larger screen (12 x 12 cm) covering nearly all of one face. This black, glassteel plate can either display text information on its surface or generate a 3-D holographic image above or behind the screen. (An image behind the screen, 'within' the viewer, is preferable in bright light conditions where the holovideo would not be as visible.) This image can be freely rotated, for views of different angles — assuming a full 360 ° scan of the original was performed.

Memory Recorder: (*) About the size of a pack of cigarettes, the Recorder makes standard 3-D video and stereovideo (within the limits of its sensors) recordings. It uses standard memory disks.

Signal Beacon: (*) A flat disk about the size of a Memory Disk, the beacon projects a very bright beam of red light as far as 10 km in length. The touch-switch allows for binary code transmission. Total light duration on one power cell: 5 hours.

Magnetic Compass: This simple device will function on any planet where magnetic poles are present. About 6 cm in diameter and 4 mm thick.

Computer Map: (*) Actually a combined scanner/recorder, this device uses hologlass plates to store visual information. The Map records information continuously in a 100 m radius about the carrier, providing a faultless return guide. Premade maps from aerial and orbital scans can also be fed into the Map, which compares scan data with immediate surroundings to pinpoint current location. One Hologlass can store about 1,000,000 sq. km of map data. The Map is a 2 cm thick, 10 x 10 cm square, one full face devoted to a glassteel display face, which displays a 3-D top-view at a nearly infinite range of magnification. The Map can also project the image (in the right lighting) in a 3 m square display.

Elmonit Card: Not a 'credit' card, but an electronic checking system. The Elmonit card is about the size of a credit card, though 5 mm thick, and contains encoded data on the possessor's available financial resources. When plugged into a Merchant or Bank transactor the data is read, and, if the holder is making a purchase, the amount is deducted, altering the data. Illegal data alteration is extremely difficult, although not impossible. Normally they are only accepted if locally (within a system) issued so that the Bank network can verify the integrity of the card. For Interstellar travel, the traveller is issued a special bank credit, with which he/she/it may set up a temporary account at the local institution. Like the Ident Disk (see below), Elmonit cards are chemically keyed to the owner.

Ident Disk (replacement): One Ident Disk is issued to each citizen of the Imperium free of charge; lost ones are replaced at a penalty charge. The Ident disk is a 5 cm plate about 2 mm thick, carrying on one face a holo-image of the bearer, and on the other face a special sensory material, engraved with the name of the bearer in standard Terran. Within the disk is held an array of personal information — physical, physiological, psychological and historical — as well as a retina scan for further Ident confirmation. Access to this information is limited, depending on the reader. Normally, only authorized Patrol readers with a master clearance have full access, and only Confederation Hospital readers have full medical (physiological and psychological) access. The disks are chemically keyed to specific body chemistry and warmth, so that if the disk leaves the proximity of the wearer long enough to fully dissipate acquired body warmth (about an hour), the disk information is destroyed, and the holo-image blurred beyond recognition. Ident Disks, like Elmonit cards, are very difficult — but not impossible — to forge. They must be worn very close to the body. Personalized disk carriers, like jewelry, are constantly moving in and out of fashion.

Glowglobe: An 8 cm diameter translucent sphere, the glowglobe is a portable, self-contained light source. Light level is altered by twisting the hemispheres, from 'off' to an illumination equal to about a 150 watt lightbulb. Also triggered when the globe is turned on is a tiny gravity neutralizer, rendering the globe weightless. A small loop is mounted on one hemisphere where the globe can be 'moored' to keep it from floating away. A variety of light shades are also available.

Lightrrod: (*) Basically a sophisticated flashlight, the lightrrod can act as a signal beacon, in addition to possessing a variety of other levels of intensity and beam width.

Recording Devices

Holocamera: (*) Able to record still or motion holographic pictures (with sound, if desired) on a hologlass plate (see Hologlass below). The camera is 10 x 5 x 7 cm and has twin lenses.

Holoviewer: (*) Basically the same device as the Memory Disk viewer, though less expensive. Adapter modules are available to convert from one to the other.

Viewer With Enhance: (*) Similar to the Holoviewer, this handy device is capable of 'enhancing' images encoded on the hologlass (this is only possible with the sophisticated digital laser recording done on a hologlass) many times, bringing into focus minute details previously too small to discern. Images may be enhanced up to 1000x.

Hologlass: 5 x 5 x 1 cm transparent glassteel square, a rectangle of metal mounted on one edge and an identifying label on the opposite edge. These small squares receive digitalized laser images, which can be stored at a very high density on their special crystalline interiors. Hologlass storage is permanent; the images cannot be altered or erased without destroying the square, which is very resilient.

Recorder (audio): (*) Useful when only an audio recording is necessary, this 10 cm long, 3 cm diameter cylinder is capable of limited stereo recording via microphones at each end. Audio disks (useable only with this type of recorder) 2 cm in diameter fit into a slot in the shaft. Touch controls modify volume, etc. The recorder is capable of playback, through the speaker/mics. A tiny readout on the side displays 'location' in storage area.

Audio Disks: 2 cm diameter molecular storage discs, they can hold up to 20 hours of audio recording each. Due to the nature of the storage, near-instantaneous reference to any data area is possible.

Makeover Kit: (2*) About the size of a small attache' case, this unit includes a built-in Holoviewer. In addition you will find a number of advanced cosmetics and colored eye lenses, allowing the skilled user to alter his/her/its face and hands to appear to be nearly any humanoid racial type. One very skilled, using a superimposed holo-image, can duplicate the exact features of another individual. An easier method of exact impersonation, also in the kit, is a spray-on mask, which allows one to make a mold and perfect mask of the impersonnee. Of course, a willing (or unconscious) impersonnee is necessary for this operation.

Environmental Aids

Tent: Holds four people comfortably, made of a virtually indestructible (in normal use) plastic material which also has superior insulating qualities. It weighs but 3 kg and collapses to a 12 cm cube when not in use.

Portable Bed: (*) An air mattress and frame, with air pillow and veriwool blanket. A tiny pump inflates the bed and powers a warmth unit in the blanket, if desired. Weighs 2 kg and collapses into a 10 x 10 x 5 cm. package.

Grav-pack: (*) A large backpack capable of neutralizing the weight of anything placed in it, up to 50 kg or .5 cumet. Care must be used, however, as the inertial mass of the pack, of course, is the same. Maneuvers are at -5/10 kg.

Pressure Tent: (*) Similar to the tent above, this unit has a double skin and can be sealed from a hostile atmosphere. It includes a pump and an air supply enough for four people to breathe comfortably for 20 hours (four Air Packs). Folds to a 20 cm cube and weighs 8 kg.

Collapsible Shelter: Capable of housing 10 comfortably, this structure is more rigid than a tent and is capable of withstanding a rougher climate. It can be sealed from atmosphere but requires a separate air supply. Folds to a 20 x 20 x 50 cm package weighing 16kg.

Filter Mask: (*) For use in areas with suitable atmospheric pressure and no gasses harmful to skin and eyes, but where the air is not capable of supporting humanoid life. The mask fits over nose and mouth, and provides breathable air for 20 hours before needing a new air pack.

Air Pack: 6 cm long cylinder 3 cm in diameter, holds 10 hour supply of compressed/solidified air mix. For use with filter mask and standard pumps, it is practically indestructible.

Life Support System: (4*) 10 cm cube unit capable of recirculating warmed or cooled air for up to ten people to breathe and live comfortably for 100 hours before requiring a new filter unit. (requires four power cells).

Gillpack: (*) For extended underwater activities, the gillpack is a 2 cm diameter cylinder 12 cm long, with a mouthpiece mounted halfway along the tube. The pack essentially allows the user to breathe air suspended in water, minimizing the problems of compression. The duration is the life of the power cell (about 100 hours in this case).

Ration Tube: A disposable plastic container (about a 6 cm cylinder 3 cm in diameter) holding a semi-liquid, highly concentrated food. Though lacking in variety and flavor (it normally has a non-offensive, if bland, taste) it is extremely nutritious and filling, and equals a full meal. A man could survive indefinitely on two a day. These rations are not subject to spoilage and are not damaged by extreme heat or cold.

Water Accumulator: (*) A 5 cm cylinder which can be mounted on the mouth of a 2 liter plastic bag. When activated, it condenses water vapor from the surrounding air and fills the self-sealing bag. Time to fill varies with atmosphere, though is usually 1-5 minutes. Power cell is good for about 500 bagfuls. Unit normally sold with 5 reusable, tear-resistant bags.

Foodpack: A more delectable if bulky form of sustenance, a foodpack is a 6 cm cube. When water is added it hydrates into actual foods (although they have been somewhat 'homogenized', each retains some natural flavor). The foodpack is guaranteed against spoilage for ten years.

3.114 Clothing

Naturally the prices given are but a base, and clothing costs can range dramatically, especially when high-fashion items or custom-made items are involved.

Thermal Jacket: (*) A lightweight jacket with a built-in heating unit. It has detachable gloves and hood.

Thermal Suit: (*) This full-body suit uses two power cells, has a hood, foot and hand coverings, and a goggled mask shielding the face. The suit can keep a man warm in temperatures to -100° or cool up to +150° for as long as 100 hours with one power cell set. The suit is not equipped to be sealed against the atmosphere, but does have a filter for warming or cooling breathing air to reasonable temperatures.

3.115 Armor/Suiting

Below are various types armor, environmental suits, and combinations. For details on AT and encumbrance see Chart 3.13.

Environmental Suit: This suit uses a shield power cell to operate its life support system. It provides minimal armor protection and is somewhat encumbering.

Kevlar Vest: A vest of impact-resistant cloth, this vest provides some torso protection against projectile, slashing and puncture attacks, but little or no protection vs impact or energy strikes.

Kevlar Suit: Similar to the vest in concept, this item covers most of the body.

Duralloy Vest: Heavier than the Kelvar vest, the duralloy protects somewhat better against melee and energy attacks.

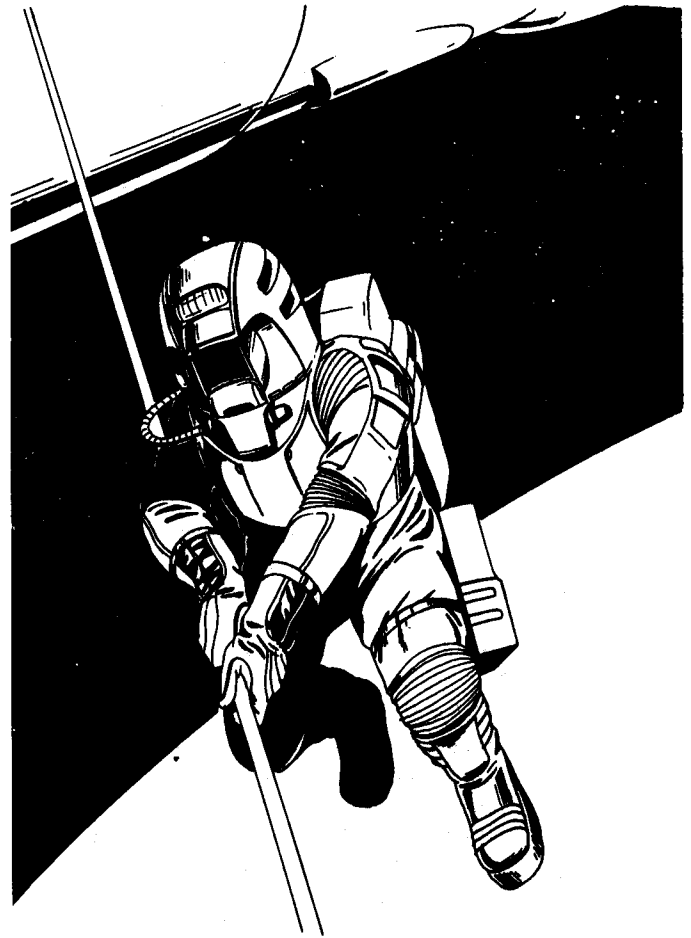
Armored Bodysuit: A lightly armored (usually duralloy) environmental suit, powered by a pistol weapon power pack.

Exoskeleton: More bulky and cumbersome than a bodysuit, the Exoskeleton is better protected at joints and the armor plating is more dense.

Powered Armor: Truly a warrior's accoutrement, the powered armor has a built-in Microfusion reactor, and all movements are servo-enhanced. Various types of powered armor are capable of extended antigrav flight, planetary landings and orbital maneuvering. The life support system can keep a man alive for 10 days, and there is storage inside for Ration tubes. In extreme circumstances some models are even capable of interplanetary journeys, assuming the distance is not too great. It requires an Mk. 10 Portable fusion Reactor, which is attached to the suit. Powered armor is usually only used for military operations, and most models are fitted with weapons and a barrier shield.

Ardinium Suit: (special) Any of the above armor suits could theoretically be made of this revolutionary alloy, greatly enhancing the AT and reducing encumbrance. The cost, however, would be prohibitive.

Ordium II Armor Suit: (special) See Ardinium suit commentary above.



Shields

All four shields described below function in basically the same manner, although the range of protection may vary. In the most advanced version, the shield is worn as a lightweight belt device (several small, cigarette-case sized modules affixed to a belt). One of the modules is the shield power pack. When the device is activated it

covers the body and accoutrements of the wearer (the focus) with a halo of energy, usually faintly visible as a shimmering aura — quite noticeable in darkness. It should also be noted that persons wearing activated shields are much more easy to pick up on multiscanner and sensor probes because of the energy output.

The shield forms about an centimeter away from the wearer's body, reacting to the surfaces like an electro-static charge. At the feet the shield dissipates out for a few centimeters over the floor where they touch. The shield will, however, only spread to envelop about 1/10th of a cubic meter beyond the volume of the wearer's body (himself, normal clothing, a small pack and a few weapons) without suffering dispersal. When dispersal occurs (and the GM should be alert for the potential of this to prevent PC abuse of shields) all normal subtractions of the shield are halved, and the shield energy cell has a 5% every round of going dead due to overload. This situation is applicable to volumes up to the equivalent of the wearer's unclothed body. The living flesh of the wearer is the basis for the field, though the shield's internal computer is capable of limited compensation. Shield computers are preset to the general parameters of the owner when bought, and complex to reprogram. The shield simply will not attempt to spread over a larger area than that, because of its microcomputer programming. If, when the shield is activated the shield computer realizes that too much volume is involved — volume even beyond dispersal — it overrides and will not activate. Any objects added after the shield is fully activated have no effect. The shield compresses to the surface it has formed over, leaving the new, added volume outside. A shield will, under no circumstances, spread to envelop another living being, even if the wearer attempts to embrace that being then activate his shield. The shield will simply ignore the other focus.

With the shields' spreading tendency, the natural question arises: how does one fire a weapon while wearing a shield without suffering the subtraction as the projectile/beam attempts to punch through the attacker's own shield? This is, in fact, relatively easily accomplished (for those using projectile or energy weapons) with a device known as a *dissipator*. The dissipator is affixed to the end of the weapon barrel and acts to prevent the shield from trying to close over the end of the barrel. Interestingly, if one is armed with a weapon equipped with a dissipator and can get close enough to an opponent who is wearing a shield, he can push the barrel through the target's shield (the barrel tip must get within one inch of the opponent, truly point-blank) and annul its effects for that shot. Long-range and projectile mounted dissipation devices have been experimented with, but even **Space Master** technology is currently not up to them.

Cruder, more bulky shield models are most often worn on the back or chest, or as a suitlike garment covering the entire body. Belt weight: 3.5 kg; back/chest weight: 8 kg.

All shields require 3 full rounds after being activated to spread and establish themselves fully. Conversely, after being deactivated they require three full rounds to dissipate.

Only one shield can be operated from one focus at any given time. Though more than one could theoretically be worn, (watch encumbrances, GMS!) attempting to have both operational around the same focus at the same time will short them out (Extremely Severe malfunction). Attempting to activate one before the full three rounds have passed after deactivating a previous one will short out the one being activated.

A. Velocity Shield: Works basically on the principle that the faster something approaches, the more resistance the shield generates. Wearer is essentially -30 vs. all regular melee attacks; -45 vs missile; -60 vs projectiles (due to greater velocity). This shield is extremely effective against projectile weapons, but useless against energy weapons, as the beam has virtually no mass to resist. An option with

the Velocity Shield is a *wrist collector*, a device worn about the lower arm, and attached to the main shield belt via a light cable. The collector affects the shield aura in such a manner that the shield's deflective energy is concentrated more at the front of the wearer (or wherever the arm is held) much like a version of the ancient physical shields. The effect adds 25 to all frontal DB's (-55 vs melee, -70 vs missile, -85 vs projectiles), however, it reduces the DB on all other facings by 20 (-10 vs melee, -25 vs missile, -30 vs projectiles). The collector may be used to parry melee and missile attacks as per **Rolemaster** — but one cannot normally parry projectiles.

B. Deflector Shield: Creating a different sort of field than the Velocity Shield, this shield is very effective against energy weapons, somewhat useful against fast projectiles, but almost useless against missile and melee weapons. It uses the very energy of the incoming attack to deflect, or alter its course. It is useful against energy waves as well as material objects, if their kinetic energy is high enough, Wearer is -60 vs energy attacks, -40 vs projectiles, -15 vs Missile, -5 vs Melee.

C. Absorption Shield: Although useful against all forms of attack, this shield is not as effective as A or B in either. It acts to absorb and dissipate over its surface the energy of an incoming object, thus slowing (or even stopping) it. Wearer is -30 against all forms of attack.

D. Barrier Shield: Able to generate a very powerful field of energy about the wearer, this is the most impressive of the four, and requires a portable reactor rather than a standard power pack (though the reactor should be treated the same as the power pack for energy drain and overload possibilities — see below). It is correspondingly bulkier and more expensive. It does, however, effectively stop all but the most determined energy weapon attacks (wearer at -90). The shield stops material objects by deflecting, or if they are moving fast enough, destroying them. Projectiles are usually completely vaporized before reaching the target. For missile and projectile attacks, treat wearer as -70; missile destroyed if stopped (unless the missile is some special material or item, in which case the GM may wish to give it a RR). For melee, treat wearer as -60; and roll a RR for the attacking weapon after each strike or attempted strike. If a metal weapon is used, wielder takes 1-10 hits during each strike, as power feedback is channeled down the weapon. Ships and vehicles employ a shield similar to this type in concept.

Shield Power Pack: Standard high-energy power cell for shield generators, it is a 6 cm square, 3 cm thick box cylinder. *The charge level of the cell must be carefully monitored to maintain play fairness.* Each cell, when fully charged, has 100 energy points. Activating the shield costs five points, and each round the shield is on drains one point. In addition, each time the shield is activated, the wearer must make an unmodified, non-open ended roll. A result of 01-03 indicates that the cell is completely dead and requires recharging. This occurs despite the power level of the cell, due to the initial immense power drain of setting up the shield. A result of 04-05 indicates a shield malfunction, and one must roll severity (1D10: 1-5: Routine; 6: Light; 7: Moderate; 8: Severe; 9: Very Severe; 10: Extremely Severe — followed by a roll on the **Malfunction/Repair table**). Changing power cells is a *Medium* maneuver during combat — assuming the player is not involved directly in melee, in which case it would be *Absurd*.

3.116 Medical Equipment

Note: Use of the following equipment requires specialized training for full effectiveness. It is not normally issued to anyone who is not at least certified in First Aid, and even then most drugs and sophisticated equipment are restricted.

Field Equipment:

Medical Scanner: (*) A device almost identical to the Multiscanner in appearance, its detection/analysis abilities are more specialized in the Life Signs field. Life form detection and distinction between animal and plantlife can be made at a distance of 1000 meters. At 500 meters, individual animal life units can be discerned (within a given 50 m radius, after a scan) and within 100 meters the instrument will give information on basic animal types. Within 2 meters it can detect subtle racial differences and simple diagnostic analysis, such as detecting foreign matter in the target bloodstream, dangerous bacteria, etc. More accurate readings on an individual are possible if the Scanner has the person's Medhistory fed into it directly. (This can be transmitted via communicator tie-in or read off of a memory disk.) Note that the Medscanner does not provide treatment advice.

Diagnostic Computer: (2*) About twice the size of the Medscanner, this unit has a 200 megabyte internal storage capacity as well as memory disks, read/write ability, and space to store five extra disks. It is a sophisticated diagnostic device, capable of a detailed biomedical and psychologic analysis. It does not perform scanning functions; rather it reads data gleaned by a Medscanner and interprets it much more effectively than the scanner, including detailed treatment advice (something the Medscanner does not do). Once again, accurate readings are much easier if the computer has had a Medhistory of the patient previously input. An average complete Medhistory (including all previous scans and medical history) takes up approximately 5000 bytes. (20,000 such records can be stored on one memory disk).

Dermal Closer: (*) Releasing an energy wave which accelerates cell regeneration radically, the Closer is used for healing concussion hits at the rate of 1/round while activated; it heals bleeding wounds (max 5 hits/round in severity) at the rate of 1/round. The Sealer will also repair up to 2nd degree burns. One power cell in this unit will heal a total of 100 hits or hits/round. The device is roughly cylindrical, 2.5 cm in diameter and 10 cm long, and is operated by holding approx 3 cm above the affected area and activating.

Tissue Knitter: (*) Working on the same principle as the Dermal closer but more powerful, the Knitter is able to rejoin muscle, tendon and cartilage. Severe and complex injuries (such as shatters) are not recommended to be treated by field equipment, as the sophistication of these devices is limited. Tissues to be joined must be aligned somewhat. The Knitter is 3.5 cm in diameter and 12 long, with more complex controls (and so more skill required to operate). Repair time varies with complexity. The power cell will repair 4 specific wounds.

Regenergun: (3*) Will repair and regenerate any severity burns at the rate of approx 10 hits/minute. The 'gun' will also regenerate destroyed muscle, cartilage, tendon and partial bone tissue, requiring about one hour for each regenerated part. The gun cannot regrow complex tissues like organs. The patient is at -25 (for each regenergun treatment) for a period of 25 hours after the treatment. It will repair any three burned areas or three specific tissue damages before exhausting its cells.

Arterial Sealer: (*) Again, similar to the Knitter and Closer, this more specialized device will rejoin severed veins and arteries (maneuver required) and stop bleeding hits at the rate of 3/rnd. It is approximately the same size as the Dermal closer, though 2 cm longer. The power cell will repair 5 severed arteries or 50 bleeding hits, or any combination (3 arteries and 20 hits/rnd, for instance).

Laseknife: (2*) Utilizing a focused laser scalpel, this device, though probably not a potential effective weapon, could be dangerous if used by the unskilled. The Laseknife is 6 cm long, 3 in diameter, with the 'blade' end cone-shaped.

Preservation Unit: (3*) This device keeps alive a patient whose body, for one reason or another, is incapable of self-support, and is beyond the capability of field medication. The unit is about the size of a small backpack, with several retractable wires and tubes, each fitted on the end with a cutaneous adhesion plate. (These plates work in a similar manner to medtabs, adhering to the skin and injecting medicines or taking samples through tiny, high-pressure infusions.) The entire setup, including patient, is placed in a special polymer bag (included). Although the device can run for as long as 25 hours on the 3 power cells, and the cells may be exchanged indefinitely, the body is not as stable as it would be if held in a more sophisticated (and much more bulky) Medcomputer Stasis Unit, and the patient's condition could deteriorate if not attended to within 25 hours (roll a RR/hour for Stat decline after 25 hrs. See **Future Law**).

Medtab Applicator: (*) An oval, palm-sized instrument, the applicator adheres Medtabs to the patient's skin. Medtabs are the latest development in controlled medicine dispensing, and are sold (to qualified personnel) in 10-tab cartridges. A cartridge is fed into the Applicator; the dosage to be applied is set on the Applicator controls — based on Diagnostic Computer recommendation or skilled treatment decision based on Medscanner readout — and the device is pressed against the patient's skin (usually on a limb). A 1 cm disk sticks to the skin, and remains firmly adhered after the Applicator is removed. The 'Tab' infuses the medication over a safe period of time and falls off, fully spent.

Tabs:

The following Tabs have a variety of uses; all of the non-healing Tabs have an **Addiction Factor**. If the drug is taken more frequently than 1x/10 days, the imbibitor must resist addiction by making a successful Resistance Roll (RR). This is done by making a percentage roll (plus Constitution bonus, if applicable) which is above the Addiction Factor. Each successive time the drug is taken, still within 10 days, adds 20 to the Addiction Factor. "Addiction" can range from a dependance on the drug, to its losing its effectiveness, to death.

Jirolene: (stimulant) Aids wakefulness; adds 20 to Perception and related alertness rolls. Prolonged use (75 hours without a full rest period) causes a deterioration of all stat bonuses at the rate of 5 points per hour, until a full rest is taken. Addiction factor: 70.

Triadrenaline: (heavy stimulant) A very powerful, short term stimulant, Triadrenaline acts to 'haste' the user for 4 rounds. Addiction factor: 80.

Hemoflux: (specific stimulant) Acts on the spleen and liver, causing greatly accelerated blood production — enough to completely replace blood supply within 2 hours. Patient must at all times still have the normal minimal amount of blood to remain alive. Patient must be kept hydrated and will be at -25 for 25 hours after taking this drug.

Luryadrenaline: (system stimulant) Used to revive patient from stasis in a portable preservation unit.

Virlene: (heavy sedative) Causes immediate unconsciousness for 2-4 hours. Addiction factor: 30.

Doseline: (sedative variant) Causes immediate unconsciousness as Virlene, but certain sleep patterns are inhibited. User awakens after only 1/4 of normal sleep time, fully rested (including PP's) and can function as normal. Addiction Factor: 80. (Addiction symptom: mental deterioration: -5 to permanent Reasoning, Intuition and Memory for every additional use/10 days when RR failed.)

Kortelline: Relieves 1-10 accumulated stun rounds. Addiction factor: 20.

Andeline: Heals 30 concussion hits over the space of 6 rounds.

Torethene: Heals 100 concussion hits over the space of 12 rounds.

Fir-Queline: Heals 10 hits instantly.

Verex Compound: A universal poison antidote, it allows the patient an additional RR at +100. Addiction factor: 25.

Stirene: (antibiotic) Extremely useful in fighting most bacterial infections. Although full recovery usually takes 24 hours, only one Stirene-aided RR is made, at +100. If the patient fails this roll (and the GM should keep this secret for two hours, which is how long it takes before even a skilled and well-equipped physician could determine whether the drug was taking effect) more extreme measures need to be taken. Addiction factor: 20. Addiction here usually means that the drug becomes ineffective.

Tyrelene: (lifekeeping) Strictly an emergency drug, it is used when even a portable Preservation Unit is unavailable. The instant the Tab is applied, the patient's body is chemically 'frozen' and will not deteriorate. Brain oxygen requirements are minimized, so that 'death' does not occur. This condition can be allowed to continue for a maximum of one hour before the brain begins to deteriorate. If a preservation unit or (preferably) a Medcomputer Stasis Unit is reached before this time, however, a dose of Luryadrenaline must be applied to cancel the Tyrelene, and the patient must roll above (100 - his Co) or die, his body unable to take the shock. Addiction factor: 100.

Regenex III: (regenerate limb) A very expensive drug, it allows the regeneration of lost body parts. It is also time-consuming, for the full regrowth of a finger will take as long as 20 Standard Days; an arm or leg 100 to 150 Days. The limb is a perfect reconstruction, however; identical to the original.

Interferon IV: (antiviral) The latest synthetic version. Immediately after it is administered the patient is allowed a new RR at +100. If it is successful, complete recovery is achieved within one hour. If not, the patient may make another roll at +100 after every hour until successful, or six tries are made, whichever comes first. If all should fail, one can receive the drug and try again after one full day (though the drug is at an additional -10 for every successive use vs the same virus).

Calcix: (antidegenerative) Used by certain beings with specific bone conditions.

Unmonitored/Recreational Tabs:

Gorteline: (recreational stimulant) Lasting about an hour, Gorteline produces a euphoric effect similar — though somewhat more intense — to the drug Cocaine. Addiction Factor: 50.

Urlene: (hallucinogen) Addiction Factor: 80.

Siradrel: (mind stimulant) Addiction Factor: 20.

Myrine: (sense enhancement) Expands vision slightly into infra-red and ultraviolet realms; allows user to view other light waves. Useful for night travel where infra-red vision would be an aid. Unfortunately, anyone under the influence of the drug outdoors in full sunlight is virtually blind without goggles. Duration: 2 hours. Addiction factor: 10.

Mertinel: (suppresses hair growth) Usually taken by men who don't want to bother with a beard and are unwilling to deal with permanent beard irradiation. The drug alters certain hormonal levels, retarding beard growth for 100 days.

Infirmery Equipment

Larger versions of all of the above treatment devices are available (Dermal Closer, Knitter, Sealer, Regenergun) with approximately twice the ability and speed of treatment. These devices are also capable of such repairs as shattered bone and destroyed organ regeneration. They are powered directly by the on-board reactor (if ship-based). These devices are also enhanced by the use of a Scanner Bed, which shows vital signs on a display, continuously updated, as well as a holo-image of the patient, with internal scans as desired by the physician.

3.117 Accessories

Tools

Small Tool Kit: (allows repairs to be made without a 25 subtraction).

Laser cutter/welder: (*) A device consisting of a handle with a 13 cm long, slender (1 cm in diameter at the widest point) cone. A dial on the base of the handle controls width and intensity of the pinpoint laser beam, which can be used to either cut through any material or fuse circuits. Though fairly powerful, it is not very practical as a weapon since the beam focuses about 1 cm from the tip of the cone.

Standard Tools: An assortment of lightweight alloy wrenches and other tools capable of performing normal mechanical repairs.

Molec Boards: The basis of modern circuitry, Molec boards are 10 cm square laminated sheets of transparent plastic with conductive and superconductive materials in the middle layers. The conductive material is electrically moved about on a molecular level to form the complex micro-circuitry used in most electronics. These sheets plug in along one edge to receptacles which tie the device together. The boards in this repair kit are blank, ready to be etched. An Etcher is, of course, necessary (and not included in this kit).

Infra-plate: (*) A 10 cm square, 1 cm thick plate of glassteel framed with a black alloy. The controls to this device are located along the edge. When placed on any surface the plate adheres and glows a dim red. Utilizing the controls the operator can gain a holographic image — which appears behind the glass exactly where it would actually be — of any solid objects behind the surface, up to a depth (viewing depth is variably controlled) of 20 cm. Excellent for viewing mechanical lock mechanisms, etc. Tools are designed to work around the plate, which is held away from the surface on tiny extensions.

Master Tool Kit: (allows repairs to be made at +20)

Contains everything in the above tool kit, plus:

Supplemental Tools

Molec Board Etcher: (*) When a molec board and the appropriate circuit programming memory disk are plugged into this 12 x 5 x 8 cm unit it will 'etch' a new board to replace the defective one.

Fuser Rod: (*) A tool used to repair minor wiring damage; more delicate and specialized than a laser cutter.

Blank Molec Boards (20)

Repair Scanner: (*) Also available separately, the repair scanner is similar in appearance to a Multi or Medscanner, though very specialized. It is dependent on circuit 'plans' (in Memory disks) with which to compare the ideal with actual circuitry status. At a range of 50 meters it will detect a disrupted circuit, and as range decreases it can pinpoint the problem. Repair scanners can act as an infra-plate, probing to a depth of 50 cm (though it does not mount to a surface and must be held), and can detect even minute electrical currents at a range of 100 meters.

Memory switch panels: (20) Standardized control panels which can be utilized to replace damaged or defective control panels and readout displays.

Accessories (Ammunition, Energy Packs, Targeting Aids)

In addition to the normal types of projectile ammunition, a few special types are available in some areas (illegal in many, though perhaps available on the Black Market). See the Price charts for cost details.

Teflon-coated: +20 to all attacks against any armor; ½10 against unarmored foes.

Irilulon-coated: +30 to attacks against armored foes; +15 against unarmored ones.

Burst-shells: Shell head shatters upon impact: all shots are at -10, but increases any critical by one severity level (i.e. an "A" becomes a "B", etc; a result of no critical does not become an "A"). Not available for needle pistol, shot gun, or flechette.

3.12 COSTS CHART

ITEM	COST	MASS	PWR		COST	WT	PWR
3.122 Weaponry				Support Weapons			
Hand Weapons				Grenades:			
7mm Automatic	30	.5		Conventional explosive	.2		
Ammunition (clip of 10 rnds)	.5			Fusion	20		
11mm Automatic	60	.7		Gas	30		
Ammunition (clip of 8 rnds)	1			Smoke	15		
5mm Body Pistol	70	.3		Glitter	80		
Ammunition (clip of 5 rnds)	2			Mark I Grenade Launcher	800	4.5	2*
10mm MLA Pistol	250	2.0	2*	Mark III Rocket Launcher	1500	7.0	3*
Ammunition (clip of 4 rnds)	20			Rockets:			
3mm Needle Pistol	60	1.0		Conv. Explosive		50	
Ammunition (clip, 6 bursts)	8			Fission	400		
5mm Rifle	70	2		Fusion	700		
Ammun. (bolt/clip of 5 rnds)	2			MA	2000		
10mm Heavy Rifle	90	5		Mark V Rocket Launcher	8500	8.5	3*
Ammunition (clip of 10 rnds)	4			Guided Rockets:			
Light Assault Rifle	240	4.8		Chemical Explosive rocket	400		
Ammunition				Fission Rocket (cruise; guided)	2000		
(clip of 3 bursts/15 rnds)	2			Fusion Rocket (cruise; guided)	4000		
7mm Rocket Rifle	280	5		M/A Rocket (cruise; guided)	9000		
Ammunition				Port. Laser Cannon (Mk. 10)	32,000	@	
(clip of 3 bursts/15 rnds)	26			Portable Blaster Gun (Mk. 10)	30,000	@	
9mm SMG (Small machine Gun)	240	2.5		Port. Disruptor Can. (Mk. 10)	25,000	@	
Ammunition (clip of 3 bursts)	2			Plasma Gun (Mk. 10)	60,000	@	
15mm MLA Rifle	550	5.5	3*	Power Packs:			
Ammunition (clip of 8)	40			Energy Cell (*)	5	.01	
3mm Tangle Rifle	140	1.5		Pistol Power Pack (‡)	30	.1	
Ammunition (cartr., 4 shots)	10			Rifle/Assault Power Pack (†)	45	.2	
15mm Shotgun	60	2.1		Microfusion Weapons Pack			
Ammunition (20 shells)	5			(for plasma rifle: @)	250	1.0	
3mm Flechette	70	1.6		Refueling cost	10		
Ammunition (20 shots)	7			Portable Fusion Reactor (@)			
20mm Autoshotgun	180	2.5		Medium Weapon	500	9.0	
Ammunition (clip, 2 bursts)	4	7.0		Heavy Weapon	900	14.0	
9mm LMG (Light machine Gun)	250	2.1		Mk 10 Portables	1200	18.0	
Ammunition (drum, 10 bursts)	10			Refueling cost	15		
(belt, 30 bursts)	30	12		Laser Targeting Unit	30	.1	2*
HMG (Heavy machine Gun)	400	12		Dissipator	20	.02	
Ammunition (belt, 30 bursts)	40			Force-knife	150	.5	‡
Hand Laser	60	.25	2*	Power Sword	450	.9	‡
Laser Pistol	90	.5	‡	Personal Equipment			
Laser Rifle	190	1.1	‡	Chronometer	1-20	.02	*
Med Laser	350	6.0	@	Infra-red Lenses	150	.005	
Heavy Laser	820	20.0	@	Inra-red Goggles	20	.2	*
Blast Pistol	100	.6	‡	Light Filter Lenses	50	.005	
Assault Blaster	160	1.0	‡	Light Filter Goggles	20	.15	
Blaster Rifle	200	1.3	‡	Ultra Lenses	300	.005	
Med Blaster	400	7.0	@	Ultra Goggles	80	.18	*
Heavy Blaster	900	22.5	@	Earphone Communicator	25	.02	*
Contact Stunner	45	.2	‡	Pocket Communicator	30	.25	2*
Hand Stunner	50	.25	2*	Distance Lenses	15-30	.3	
Stun Pistol	80	.5	‡	Multiscanner	600	.9	2*
Stun Rifle	180	1.1	‡	Memory disks (box of 5)	20	.05	
Plasma Repeater Rifle	250	8.0	@	Memory Disk Viewer (portable)	80	.8	*
Flame Pistol	125	.7		Memory Recorder	100	.3	
Ammunition (cartr., 4 shots)	10			Signal Beacon	10	.1	*
Flame Rifle	180	1.5		Magnetic Compass	1	.1	
Ammunition (cartr., 8 shots)	16			Computer Map	60	.6	2*
Special Ammo:				Elmonit Card	5	.02	
(for projectile weapons)				Ident Disk (replacement)	200	.05	
Burst-shells, multiply cost x 5				Glowglobe	1	.25	*
Teflon-coated,				Lightrod	.3	.2	*
multiply cost x 10							
Irululon-coated, cost x 20							

	COST	WT	PWR
Recording Devices:			
Holocamera	45	.4	*
Holoviewer	30	.5	*
Viewer With Enhance	140	.8	*
Hologlasses (box of 5)	15	.1	*
Recorder (audio)	8	.8	*
Audio Disks (box of 5)	2	.08	
Makeover Kit	45	1.0	
Environmental Aids:			
Tent	20	3.0	
Portable Bed	6	2.0	2*
Grav-pack	20	(to 50 kg)	*
Pressure Tent	85	8.0	2*
Collapsible Shelter	120	16.0	
Filter Mask	5	.25	
Life Support System	40	.5	4*
Gillpack	45	.4	*
Ration Tube	.2	.05	
Water Accumulator	5	.5	
		(empty)	*
Foodpack	.5	.08	
Clothing			
Dress Clothing	60	varies	
Dress Footwear	10	"	
Leisure Clothing	40	"	
Leisure Footwear	8	"	
Uniform	50	"	
Uniform Footwear	10	"	
Light Jacket	5	"	
Thermal Jacket	20	"	*
Thermal Suit	40	"	2*
Armor/Suiting			
Environmental Suit	600	4.0	+
Kevlar Vest	40	.5	
Kevlar Suit	150	1.2	
Duralloy Vest	220	.9	
Armored Bodysuit			
Type 1	4000	15.0	+
Type 2	4500	17.0	+
Type 3	5000	20.0	+
Exoskeleton			
Type 1	7200	25.0	+
Type 2	7800	30.0	+
Type 3	8400	35.0	+
Powered Armor			
Type 1	32,000	200	@
Type 2	60,000	300	@
Type 3	90,000	400	@
Type 4	150,000	650	@
All of the above armors are theoretically available in the special alloys. Use the above price with cost multiplier:			
Ardinium Suit x 10			
Ordium II Armor Suit x 20			
Velocity Shield Belt Unit	3,000	1.1	+
Chestpack	1,300	6.5	2+
Deflector Shield Belt Unit	3,500	1.2	+
Chestpack	1,500	6.5	2+
Absorption Shield Belt Unit	3,000	1.3	3+
Chestpack	1,200	6.8	2+
Barrier Shield (chestpack only)	15,000	3.3	@
Shield Power Pack (+)	100	.2 (inc in shield wts.	

	COST	WT	PWR
Medical Equipment			
Medical Scanner	520	.9	2*
Diagnostic Computer	800	1.9	4*
Dermal Closer	120	.2	*
Tissue Knitter	160	.3	*
Regenergun	240	.35	3*
Arterial Sealer	150	.25	*
Lasenife	150	.2	2*
Preservation Unit	300	1.2	4*
Medtab Applicator	60	.2	*
Tabs: (clip of 10)			
Jirolene (Stimulant)	20		
Triadrenaline (Heavy Stimulant)	200		
Hemoflux	120		
Luryadrenaline	100		
Virlene (Heavy Sedative)	50		
Korteline (Relieve 1-10 stun)	250		
Andeline (Heal 30 in 6 rounds)	100		
Torethene (Heal 100 in 30 rnds)	150		
Fir-Queline (Heal 10)	50		
Verex Compound			
(poison antidote)	200		
Stirene (antibiotic)	25		
Tyrelene (lifekeeping)	5,000		
Regenex IV (regenerate limb)	10,000		
Interferon IV	500		
Calcix	2.5		
Tools			
Small Tool Kit (includes items below and case)	720	2.0	
Laser cutter/welder	110	.4	3*
Standard Tools	100	1.0	
Molec Boards (10)	300	.5	
Infra-plate	200	.1	*
Master Tool Kit			
(All above, plus:)	2500	6.1	
Supplemental Tools	100	1.5	
Molec Board Programmer	500	.5	3*
Blank Molec Boards (20)	600	1.0	
Fuser Rod	60	.2	*
Repair Scanner	600	.9	2*
COST: is in standard Elmonits.			
MASS: is in Kilograms. All mass for items which require an energy pack include the mass of the pack.			
POWER:			
* indicates standard utility power cell required (number in front of symbol denotes how many)			
‡ indicates pistol power pack required			
+ indicates shield power pack required.			
† indicates rifle stock power pack required			
@ indicates portable microfusion reactor required. See text; size may vary. A field reactor which can be refueled by simply pouring water into it (rather than having to take it into a qualified refueling shop) can be purchased at twenty times the normal cost. These special reactors also mass half again as much.			

3.13 ARMOR RATING AND ENCUMBRANCE

ARMOR/SUIT TYPE

	AT (DB)	MIN MANEUV PENALTY	MAX MANEUV PENALTY	MISSILE ATTACK PENALTY	QUICKNESS PENALTY	RADIATION BONUS
Environmental Suit	2 (10)	0	0	-25	-20	0
Kevlar Vest	5 (15)	0	-10	0	0	0
Kevlar Suit	10 (15)	0	-20	-10	-5	0
Duralloy Vest	5 (30)	0	-15	-5	-5	0
Armored Bodysuit						
Type 1	15 (10)	-10	-40	-10	-10	-1 lvl
Type 2	15 (20)	-15	-45	-10	-15	-1 lvl
Type 3	15 (30)	-20	-50	-15	-20	-1 lvl
Exoskeleton						
Type 1	12 (30)	-20	-60	-20	-10	-2 lvls
Type 2	20 (20)	-30	-70	-25	-20	-2 lvls
Type 3	20 (30)	-40	-80	-30	-25	-2 lvls
Powered Armor (Special; see below)*						
Type 1	20 (110)@	0	-100	-100	-5	-3 lvls
Type 2	20 (120)@	0	-100	-110	-5	-3 lvls
Type 3	20 (150)@	0	-100	-120	-5	-4 lvls
Type 4	20 (170)@	0	-100	-120	-5	-4 lvls

Radiation Bonus: indicates how many critical severity levels the armor will protect the wearer from. For instance, a character in a Type 2 Powered armor suit is exposed to an "E" severity radiation attack. The armor reduces the severity 3 levels, from an "E" to a "B".

* When attacking against powered armor with any handheld weapon, that weapon's maximum Mark # should be reduced two levels (a Mark V weapon cannot roll above the Mark III threshold). The symbol "@" indicates a barrier shield (all powered armor). See the rules for shields, sect 3.1 for details on the additional DB supplied by the barrier shield.

POWERED ARMOR:

To determine Heavy Energy Projector and Missile attacks against powered armor, use CAT 22, subtract 100 from the DB given above and roll the attack. Use the Slash Critical table for Pierce weapons and the Impact Critical table for Blast weapons.

Powered armor is a special class, having many qualities beyond the other types of armor. The suits are self-sealing, so even though the occupant may take wounds, his environment will remain intact — *until* the suit goes over its maximum hits, in which case its major systems fail; ten minutes of environment left at that point (assuming a hostile environment outside!).

The Maneuver penalty is a reflection of the need to adapt to using the servo-mechanisms which allow the armor to move; someone fully trained is extremely maneuverable and agile.

All powered armor is equipped with a barrier shield, a backpack fusion reactor and gravitic power. The Type 4 has a separate Fusion drive with an N-Space acceleration rating of 2 (see 6.2), and fuel for 1 hour of continuous thrust (more than enough for a few interplanetary trips). The reactors in all four have 500 'energy points'. It requires 1 energy point per hour of normal suit operation, + 1 point per hour of gravitic flight, + 1 point per Mk. # per shot of mounted weapons fire.

Characters using powered armor weapons must train in those weapons specifically to obtain a skill bonus. Powered armor weaponry uses the Handheld tables against personnel; Ship attack tables against Vehicles, as appropriate.

TYPE	MOTIVE FORM	(hits)	MASS Con AT	WEAPONRY
1	Gravitic jump: 100m , 1x/rnd	200	22 (55)	None
2	Slow Gravitics	300	22 (60)	1 wrist mtd. Mk. 3 Laser (+3)
3	Medium Gravitics	400	22 (75)	1 wrist mtd. Mk. 3 Laser (+3) 1 shldr mtd. Mk. 5 Blster (+5)
4	Fast Gravitics	650	22 (85)	2 wrist mtd. Mk. 4 Lasers (+4) 1 shldr mtd. Mk. 5 Blster (+10)

Power Cells

Energy Cell: Flat, disk-shaped battery about the size of a dime, used in most personal equipment.

Weapons Power Pack: Standard power source for handheld weapons, it is a cylinder 2 cm in diameter and 6 cm long, fitting into the pistol butt. Power packs can be recharged either by a portable reactor, vehicle outlet, or standard Utility outlet.

Rifle Power Pack: Ellipsoid cylinder 12 cm long and 3 cm wide, it fits into the rifle butt socket.

Plasma Repeater Rifle Microfusion Reactor: This cylindrical unit is 10 cm in diameter, 15cm long and weighs about 2kg. When its power is exhausted, it is easily detached from the end of the rifle and is replaced like a power cell. Refueling is a simple operation, and can be done on nearly all the Civilized Worlds.

Portable Fusion Reactor (Mk. 10): Capable of powering a number of appliances, and recharging power cells. The size of a large backpack, it weighs about 30 kg (Antigrav units to null the weight are available).

Laser targeting Mount (*): A slender cylinder, it mounts on the barrel of any rifle, weapon and fires a non-dangerous laser beam, which can be used for pinpoint targeting, adding +20 to hit. It can also be used on large pistols, such as the MLA Laser and Stun pistol (Blaster is too inaccurate) adding +10.

NOTE: if using a Character-development system involving Skills — such as **Future Law** — it is strongly advised the PC's train on a weapon specifically with or without the targeting mount. Anyone using a gun with a mount but no training in its use gets half bonus; anyone trained in using a gun with the mount but forced to use one without is at -20

3.2 THE ROLE OF COMPUTERS

It would no doubt be an understatement to say that computers play an important part in the universe of **Space Master**. Indeed, they are everywhere, expediting every facet of life in the far future. They are miniaturized to microscopic size in many cases, and can perform functions of amazing complexity at speeds truly approaching instantaneous.

State of the art computer circuitry memory storage is done on a molecular level; memory units are, in a way, alive. This allows far more dense storage and faster relays. Many larger units are voice-controlled, able to interpret and respond to verbal commands — though of course only in languages for which the computer has been programmed. For accuracy and efficiency, however, computers on board most starships and other complex vehicles are still manually controlled to a great extent. This is not a reflection of the machine's limitations, but rather of the being who must give it instructions. Direct mental links from the human brain to computers have been tried, but proved ineffective and even dangerous; the human mind is simply not disciplined enough to give coherent commands which are not accompanied by a flurry of aberrant irrelevant 'mental chatter'. And vocal commands are not precise because of the inevitable inaccuracies of any sentient-based language. The idea of a computer language to be used by sentients was proposed, but the effort of learning it outweighed the advantages.

Thus, even in **Space Master**, the weak link in any such sentient-computer interface is just that: the delay which occurs between the sentient visualizing and deciding on the action, and the delivery of the action command to the machine.

In **Space Master**, though, the computer has been able to take over very complex tasks (such as continuous evasive maneuvers in a starship battle, even when coordinating gunner fire) the details of which need not concern the sentients in charge.

Obviously, to attempt to cover the entire range of software available in the universe of **Space Master** would be absurd. Instead, below are detailed the typical programs available to enhance a starship's performance. Some are necessary for the ship to even operate, while some are optional.

3.21 PROGRAMS AND DESCRIPTIONS

Below are brief descriptions of the various computer programs available in the most advanced areas of the **Space Master** universe. All programs may not be available everywhere, or, if available, they may only be 'partial' (only the first ten memory unit picks, for instance).

Remember when purchasing programs that each has two important volume factors, in addition to the cost: *Processing Capacity* and *Memory Volume*. This reflects the concept that certain programs, such as Archive Reference and the Research programs, consume a vast amount of *Memory* volume because of the sheer mass of data. However, their data retrieval system is relatively simple, and requires only a small amount of *Processing* capacity. Complex, demanding programs, such as Evade and Predict, consume very little *Memory* volume, but, depending on how demanding or sophisticated, a lot of *Processing* capacity. The volume and capacity for a specific standard computer are determined by its Mark (Mk.) number: the processing volume capacity is exactly equal to the Mk. #, while the memory volume is 2 x the Mk. #. Available programs always use memory volume but only use processing capacity when being used. In addition, standard computers have what is called *Reserve Storage*. It is not as easily accessible as *Memory*, but has a much larger capacity — ten times the Mark number in storage volume. However, this memory storage is not as easily accessible: it requires one round per memory unit to transfer the program from *Reserve Storage* to memory, where it can be easily accessed and used. In this capacity, therefore, *Reserve Storage* is useful for Archive and Research data, but probably not for regular combat program storage, since it would require too much time to 'call up' the necessary programs from *Reserve Storage*.

EXAMPLE: Teruk has an Mk. 50 computer. Its processing capacity is 50, and its memory is 100 units. It has a *Reserve Storage* volume of 500 units.

The reference to *memory units* refers to a discreet unit of data. As many as desired (or one can afford, or one can pack into their computer) may be purchased. However, there is a declining rate of return, based on the idea that the mass of information reduces the efficiency of the processor. It also reflects the idea that after a point the additional data in memory is more peripheral, and increasingly less relevant to the topic.

For those programs who have a cost per memory unit pick, the initial purchase provides a +5 bonus to the appropriate research /technical activity/maneuver (counting as the initial investment as well as the first 'rating pick'). Each additional pick adds another +5 to the appropriate bonus, up to a total of +50. The eleventh through twentieth picks, though they cost the same, only supply a +2 bonus per pick. Any additional picks beyond twenty add +1 per rating pick.

EXAMPLE: Jym-bob (see *Starship Construction*, section 4.211) wants a +60 to his ship **Predict** bonus. To do this he must spend a base price of 10,000 Elmonits (this provides +5) and an additional 14 picks, costing 2,000/rating pick. The next nine picks add +5 each, to have a total of +50. Five more rating picks are required at +2 each (still costing 2,000) to gain the total of +60. Total Elmonit expenditure: 38,000.

It is assumed that each pick fills one computer unit, regardless of the bonus. See individual programs for whether the volume is consumed in *Memory* or both *Processing* and *Memory* (if it takes up a unit of processing space, it must take up at least the same amount of space in memory for storage while not in use).

PROGRAM DESCRIPTIONS

General Reference: An encyclopedic database, referenced by subject with multiple cross-references. Includes very basic information on Terran general history, the sciences, the arts, literature, etc.

Xeno Gen. Ref: The complement to the General reference database above, this file covers all terran colonies as well as any general data on other races encountered by Civilization. By necessity, this file is even more general than the above, having to cover a wider field.

Archive Reference: This file covers the same areas as the General Reference program, but in much greater depth, especially in the non-science fields. The detail and referencing is exhaustive; however, it does not approach some of the planetary Archive databases; consuming as much as 10,000 Storage units, they might truly hold what could be called the "sum of human knowledge".

Research Reference:

Physics: Each memory unit pick adds a bonus to all research done on this topic. Note that this total is cumulative with lab space bonus, but cannot exceed the lab bonus.

Chemistry: As Physics, above.

Biology: As Physics, above.

Planetology: As Physics, above.

Astronomy: As Physics, above.

Cultures: Each memory unit pick adds a bonus to all anthropological and cultural research.

Medicine: As Physics, above.

Mechanical Engineering: As Physics, above.

Genetics: As Physics, above.

Computers: As Physics, above.

Weapons Design: As Physics, above.

Power Systems Theory: As Physics, above.

Cybernetics: As Physics, above.

Technical Reference:

Mechanical: Each memory unit pick adds a bonus to all repairs and construction related to this topic. Use appropriate table.

Weapons: As Mechanical, above.

Electronics: Includes all electrical systems. As Mechanical, above.

Communications: As Mechanical, above.

Computers: As Mechanical, above.

Power Systems: As Mechanical, above.

Stardrive: As Mechanical, above.

Crime Systems: As Mechanical, above.

Medical Systems: As Mechanical, above.

Cybernetics: As Mechanical, above.

Genetics: As Mechanical, above.

Basic Systems Monitoring: Automatic ship's log; all minor systems control (lighting, portal control, etc.).

Recreation: Games, movies, etc.

Life Support: Maintains environment.

Galley: Food synthesis.

Xeno Galley: Food synthesis for exotic tastes / other races).

Astrogation Reference:

Star Chart: A complete map of the known galaxy is available, though the total volume would be prohibitive. Astrogation is made "Easy" if within an area on file. See cost chart for price per memory unit.

Preset Course: Astrogation for such a course is "Routine".

Astrogation Plotting:

Hyperspace Course: Computes Hyperspace Course. Without program, computation is "Absurd". (However, every day spent by a trained individual with proper references lowers the degree of difficulty by 1.)

N-Space Course: Computes N-Space Course. Without program, computation is "Absurd". (However, every day spent by a trained individual with proper references lowers the degree of difficulty by 1.)

Pilot Interface:

Hyper Jump: Controls Antimatter flow to Translight Engines.

Autopilot: Can maintain a course, or carry out Preset N-space course

Evade: Each processor unit pick adds a bonus to ship DB due to computer controlled evasive maneuvering. (1 unit processing and one unit memory per pick)

Tactics: Each processor unit pick adds a bonus to ship initiative. (1 unit processing and one unit memory per pick).

Power Distribution: Controls and monitors distribution of power to all ship systems.

Damage Control: Malfunction alert and flame detection/control. Seals doors to contain decompression unless overridden.

Security: Monitors and can restrict movement of specific beings within installation. Requires .1 memory unit per being.

Cybernetic Monitor: Controls robotic assignments. Requires .5 memory unit per special system.

Communications: Allows Com Tech bonus on Transmission / Reception, including both Tachion Beam and Laser signals. Each processing pick adds a bonus, and 5 Light-years of Tachion Beam range.

EW Distribution: One pick for every 10 points of EW (actual EW equipment purchased separately) is necessary for manual control of EW/Stealth screens. Each Processing pick also adds a bonus for all EW activity (no matter how many operators). (1 unit processing and one unit memory per pick).

Target Lock-on: Allows shipboard Heavy Energy Projectors to be committed on any target in Sensor range (see ship construction for ship sensor ranges). Energy attacks without this program are at -30 (in addition to any other factors).

Central Gun Control: Allows any number of ship's guns to be fired from central control with controller's gunner bonus (-10 to bonus for every gun over one controlled).

Gunner Interface: Allows inclusion of individual gunner's fire bonus for Heavy Energy Projectors.

Predict: Each pick adds a computer bonus for Heavy Energy weapons fire. (1 unit processing and one unit memory per pick).

Missile Targeting: Each pick adds a computer bonus for missile targeting. (1 unit processing and one unit memory per pick).

Defense (screens): Arranges and maintains shields. Processor and memory required is 1 per 10,000 tons (1 unit minimum). Also allows for "Double Shielding" — see ship combat, section 6.21.

Star System Analysis: Reference data; each pick adds a bonus to sensor analysis, and fills one memory cell — in addition to the base volume of 3.

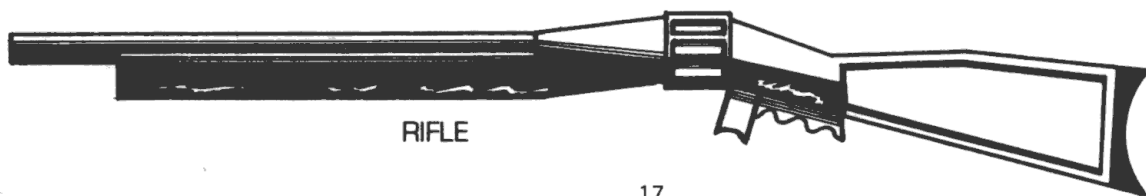
Planetary Analysis: Reference data; each pick adds a bonus to sensor analysis of planetary and stellar bodies, and fills one memory cell — in addition to the base volume of 3.

Bio Analysis: Reference data; each pick adds a bonus to sensor analysis of life forms, and fills one memory cell — in addition to the base volume of 3. Range for such analysis is no more than a high-orbit above scanned planet.

3.22 PROGRAM SIZE AND COST

Computer Program Costs (See sec 3.2 for details)

Program/Database Name	Size Processing Memory		Cost (Elmonits)
General Reference	5	20	5,000
Xeno Gen. Ref.	5	30	8,000
Archive Reference	5	5 + Special	5,000 + 500/Memory data unit pick
Research Reference			
Physics	4	20	1,000 base + 500/memory unit pick
Chemistry	4	20	" " " " "
Biology	4	20	" " " " "
Cultures	4	20	" " " " "
Medicine	4	20	" " " " "
Engineering	4	20	" " " " "
Technical Reference			
Mechanical	1	5	1,000 base + 300/memory unit pick
Armaments	1	5	" " " " "
Electrical	1	5	" " " " "
Communications	1	5	" " " " "
Computers	1	5	" " " " "
Power	1	5	" " " " "
Stardrive	1	5	" " " " "
Field Science Systems	1	5	" " " " "
Medical Systems	1	5	" " " " "
Basic Sys Monitoring		special	500/ 1000 tons
Recreation	1	1	500
Life Support		Special	100/10 beings
Galley	1	1	300
Xeno Galley	1	1	800
Astrogation Reference:			
Star Chart	1	Special	2,000/storage cell (100,000 cu. lt. yr.)
Preset Course	0	1/course	500/course
Astrogation Plotting:			
Hyperspace Course	3	3	3,000
N-Space Course	3	3	4,000
Pilot Interface			
Hyper Jump	3	3	2,000
Autopilot	5	5	8,000
Evade		Special	5,000 base + 2,000/pick
Tactics		Special	5,000 base + 1,000/pick
Power Distribution	2	2	5,000
Damage Control	2	2	3,000
Security	1	Special	1,000 + 100/being
Cybernetic Monitor		Special	5,000 + 2,000/system
Communications	1	1	8,000
EW Distribution		Special	5,000 base + 1,000/ 10 pts of EW
Target Lock-on	2	2	7,000
Central Gun Control	.1/gun	1	12,000
Gunner Interface	1/gnr	1	2,000/gunner
Predict		Special	5,000 base + 1,000/rating pick
Missile Targeting		Special	5,000 base + 1,200/rating pick
Defense (screens)		Special	1000/10,000 tons
Star System Analysis	3	3 + Special	1,000 base + 500/memory unit pick
Planetary Analysis	3	3 + Special	" " " " "
Bio Analysis	3	3 + Special	" " " " "
Construct Analysis	3	3 + Special	" " " " "
Medical Diagnosis	2	2 + Special	1,000 base + 200/memory unit pick
Medical Procedure	2	2 + Special	" " " " "
Xeno Medicine	2	2 + Special	2,000 base + 500/memory unit pick



RIFLE

Construct Analysis: Reference data; each pick adds a bonus to sensor analysis of artificial constructs and energy sources, such as other spacecraft, ground-based installations, etc., and fills one memory cell — in addition to the base volume of 3.

Medical Diagnosis: Reference data; each pick adds a bonus to on-board scanner analysis of patients, and fills one memory cell — in addition to the base volume of 3.

Medical Procedure: Reference data; each pick adds a bonus to surgical or medicinal procedures performed on-board and fills one memory cell — in addition to the base volume of 3.

Xeno Medicine: Reference data; each pick adds a bonus to medical diagnosis of another life-form (than homo-sapiens or derivatives) and fills one memory cell — in addition to the base volume of 3.

3.3 ROBOTS, ANDROIDS, AND ALTERANT REPLICANTS

Below are briefly defined the general types of Robots, Androids and Alterant Replicants which can be purchased "as is". In section 3.32 are the exact abilities of each of these products, and in 3.33 the costs. For custom models, see section 4.2. Special models are correspondingly more expensive.

Before detailing these units, however, a few other clarifications might prove helpful:

Clone: A genetic duplicate of a specific human. Though genetically the same, the Clone may not be identical at maturity, since memories will differ, unless memories are restored — see sec 4.322 — and even then the Clone's behavior will diverge.

Cyborg: (Cybernetic Organism) A sentient being with mechanical/electronic parts (such as limbs or organs). A Cyborg may or may not even resemble a Hominoid in appearance; the key defining factor between Cyborg and Android is whether or not the actual brain is living human flesh.

Hominoid: Term used to describe any being or machine resembling the classic *Hominid* form. Humans and close mutations, Replicants of humans, Clones, and Androids all fall within the bounds of *Hominoid*. So also do any other sentient peoples possessing two arms, two legs and a head in the same basic arrangement as humans.

3.31 DESCRIPTIONS

3.311 Robots

A vast range of machines, but defined here as being an intelligent, self-propelled machine. Robots (with the exception of special Combat Bots) are usually no larger than two meters tall, and possess manipulative limbs suitable for repair, manual labor, or mechanical interface, or weapons operation. Some robot designs are vaguely man-like in form, possessing arms and legs, but are distinguished from Androids in that they are clearly machines (being metal encased, etc.) and not *designed* to imitate humans, except as necessary for their function. In the descriptions of the specific types below, references are made to bonuses to functions. These are explained in detail in section 4.221.

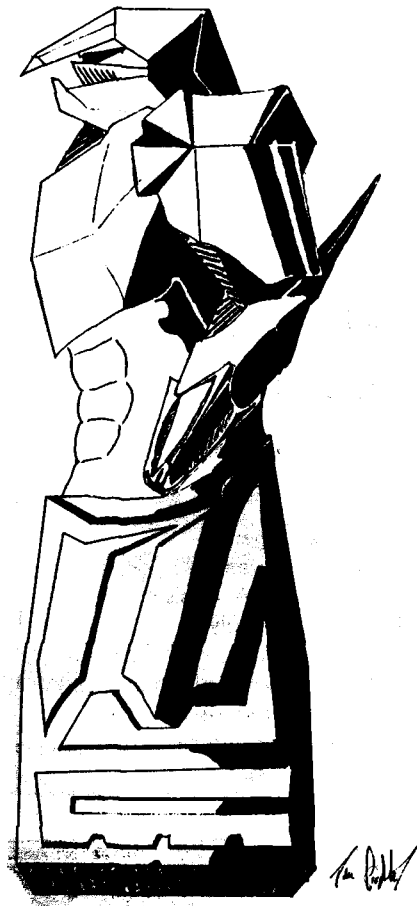
Service Bot: The standard model is short and squat (1 meter high), with several extendable limbs fitted with interchangeable manipulative devices. The Bot's Mk. 10 computer can be programmed with any Technic data (see 3.21) or it can be purchased pre-programmed (add program cost separately). It has a +50 *Manipulate* bonus, in addition to the programmed Technic skill. Remember that it is at -25 to all repairs with no applicable skill in its computer. It has normal audio/visual pickup ability, and a Computer Mech Interface, to receive computer data. It can be programmed to understand any language, but 'speaks' only BIVOC (the Binary Vocabulary of computers).

Mech Interface Bot: Less than a meter high and roughly cylindrical, this robot is basically a mobile computer. With an Mk. rating of 20 it can run several sophisticated programs simultaneously. See "Service Bot" above for references to computer input. Available interfaces: Pilot, Heavy Energy Projectors, Sensors, EW and Computer. Beyond a few small manipulative arms and the interface hookup, this Bot is unadorned. It has short range audio/visual pickup, and it can be programmed to understand any language, but 'speaks' only BIVOC (the Binary Vocabulary of computers).

Cyborg Relations Bot: Probably the most 'humanoid' of the robots, this device is just under 2 meters tall, has legs, arms and a head, but there the resemblance ends. The Relations Bot's prime function is liaison between humans and robots, and as such most of its Mk. 5 computer is taken up with language data. It can freely translate between any language and BIVOC.

Combat Bot Type I: Three and a half meters tall, this fearsome machine mounts an Mk. 3 laser on each arm. It has a 500m Sensor range, as well as normal audio pickup and visual normal and infra-red. Its shields add 50 to its DB; it speaks and understands only BIVOC — instructions must be programmed.

Combat Bot Type II: Slightly more mobile than Type I, this Bot is 2 and a half meters tall and walks like a man. One arm is an Mk. 5 Laser, the other is a mechanical hand with +10 *manipulate skill*. On the shoulder is mounted an Mk. 5 Heavy Machine Gun. It stores 100 bursts of ammunition. This Bot has normal audio pickup, and visual into infra-red. Its shields add 50 to its DB. It can only communicate in BIVOC.



3.32 ROBOT COST AND ABILITIES CHART

TYPE	MOTIVE FORM	HITS	AT	(DB)	ARMAMENT (OB)	PWR X	COST	NOTES
Robot								
Service Bot	S WHEEL	50	15	(0)	—	1	50,000	See text 3.311
Mech Interface Bot	S WHEEL	100	14	(0)	—	1	65,000	" " "
Cyborg Relations Bot	WALK	80	13	(10)	—	1	40,000	" " "
Combat Bot Type I	S TRACK	200	24	(60)	2 Mk. 3 Lsrs (63)	3	150,000	" " "
Combat Bot Type II	WALK	240	23	(60)	1 Mk. 5 Lsr (50) 1 Mk. 5 HMG (70)	2	90,000	" " "
Combat Bot Type III	M GRAV	300	25	(100)	2 Mk. 5 Blstrs (80) 1 Mk. 5 Plasma Repeater Rifle (100)	4	250,000	" " "
Android								
Warrior	—	220	11	(50)	+ 150/+ 100/+ 80 any weaps		250,000	10th lvl. *
Pilot	—	160	4	(30)	+ 80/+ 50 any weaps		200,000	10th lvl. *
Tech	—	160	4	(30)	+ 50 one weap		175,000	10th lvl. *
Protocol	—	100	4	(20)	—		150,000	10th lvl. *
								*See text 3.312
Replicant								
Type I (Warrior)	—	200	1	(40)	+ 100/+ 80/+ 50 any weap		120,000	10th lvl. *
Type II (Tech)	—	130	1	(20)	+ 50 one weap		100,000	10th lvl. *
Type III (Clerical)	—	80	1	(10)	—		60,000	10th lvl. *
Type IV (Recreation)	—	80	1	(30)	+ 50 one weap		80,000	10th lvl. *
								*See text 3.313

KEY:

MOTIVE FORM: refer to the Vehicular Movement Table (4.24) for the explanation of these terms. The humanoid types obviously move as humans.

AT (DB): The Armor type is listed, with the standard Defensive Bonus (DB) in parentheses afterwards.

ARMAMENT: Any and all armament. The total Offensive Bonus (OB) for each weapon type. A "—" indicates that this weapon is found on the Master Weapons Chart (5.6) and as an antipersonnel weapon should use those rules. Android and Replicant bonuses are applicable to any handheld weapon desired.

PWR X: the multiplier to be applied once a Power source/Energizer has been selected (from chart 3.42) for the vehicle. Use common sense when selecting a power source; do not buy a combustion engine for a SMAC fighter, for instance. Such machines require a fusion reactor.

COST: the average cost for the Robot/Android/Replicant in Elmonits (Power source/Energizer cost not included for Robots).

Combat Bot Type III: Perhaps the most terrifying of the three Combat Bots, this one floats on silent gravitics with + 30 stalking skill. It is 3 meters tall and mounts 2 Mk. 5 Blasters on the shoulders, and a Plasma repeater Rifle on one arm. The other arm has a hand with +20 manipulate capability. It has a 10km Sensor range, as well as normal audio pickup and visual normal and infra-red. Its shields add 60 to its DB (the rest comes from maneuverability and superior armor). It also has +40 in Intellect and can speak up to 3 human languages fluently.

3.312 Androids

Android: A robot designed to closely resemble a human being or other sentient race. Androids have an artificial, Molecutronic brain, but are highly intelligent: capable of self-programming and extreme versatility. The highest-quality models are indistinguishable from real sentients except by sensor (or other artificial) scan. Androids are often much stronger and/or quicker than their sentient counterparts. They also *learn*, gathering experience and increasing their skills just like humanoids.

Warrior: What else need be said? Intellect was not a programming priority, except to instill an almost animal cunning. Large and muscular in appearance, these Androids can be programmed with certain absolute loyalties, and other 'morals' as desired (there are legal minimum requirements in most areas). Popular as bodyguards, they are considered a status symbol on the densely populated, highly-civilized worlds.

Pilot: Preprogrammed with + 50 to as many as 5 piloting / driving skills, these are very useful to large companies needing pilot/chauffeurs, etc.

Tech: Similar to the Pilot in nature, the Tech is purchased with 5 Technic skills (purchaser's choice) with a + 50 bonus in all.

Protocol: Programmed with a variety of customs and local etiquettes, this Android is rarely seen outside of the high-society "inner worlds". They are invariably attractive, but always somewhat bland.

3.313 Alterant Replicants

Also called simply "Replicants", these are beings created from sentient genetic material but altered using Recombinant DNA and other techniques to create an "improved model". It is scientifically possible to perform Alterant Replication upon animals, plants, and most sentient species. Below are listed the four most "popular" Human Replicant types and their general functions. They are not as dependable as Androids, but somewhat less expensive and easier to maintain.

Warrior: Strong and agile, they can be purchased with skill in almost any weapons combination (see chart 3.32). Also have + 25 skill in Stalking/Hiding and Climbing.

Tech: Identical to the Android Tech, but start with + 30 in 3 Technic skills.

Clerical: Well-organized memory (perfect short-term memory) makes this Replicant an excellent secretary.

Recreation: This Replicant is primarily versed in the skills of Gaming, Acrobatics, Dance, Gambling, Music, and of course, Seduction.

3.4 SMALL VEHICLES

The vehicles described below are for the most part limited to small machines, designed to carry no more than ten persons. The craft are either vehicles for private use, small research parties, or exploration.

3.41 DESCRIPTIONS

Below are described a number of commonly used vehicles of different types and purposes. These are for quick reference and general use: if the player or GM desire a more specific special-use vehicle, they should use the Construction rules, section 4.2. Some general terms used throughout the section are defined here:

AFV: (Armored Fighting Vehicle) A type of ground conveyance vehicle designed specifically for combat.

GEM: (Ground Effect Maneuvering) Using powerful fans to create an air cushion, this system requires an atmosphere of a density range similar to Terra. Altitude is usually fixed at no more than one meter.

Gravitic: Utilizing a gravitic field to partially nullify gravity's effect upon the vehicle. Unless otherwise specified (such as for air and spacecraft) they have a limited lifting power and an altitude limit of 10 meters. For vehicles like cars, their altitude is fixed at .5 meters.

Hydrofoil: A fin or set of fins so designed as to lift a ship's hull out of the liquid and reduce friction, thus allowing an increase in speed. This general principle is applied with some modifications here. Such craft are usually propelled by hydrojets: jets which pump tremendous amounts of water (or whatever the travel medium is) out with great force, driving the craft forward.

SMAC: (Singly Manned Attack Conveyance): A type of space fighter used for short-range missions.

3.411 Ground Conveyance Vehicles

This definition applies to all vehicles which require a solid surface on or above which to act — and of course gravity to pull the vehicle towards that surface.

Cars:

Vehicles for transporting passengers or supplies. These have minimal interior environmental control (heat/cool/humidity) and are not suitable for any environment other than standard Terran.

Wheeled Car: This refers to any sort of vehicle which depends upon the friction of wheels against a solid surface for propulsion. In more sophisticated versions the wheels are of some soft material or an inflated polymer. This cushions the ride for any passengers and equipment. These 'tires' are often the most vulnerable part of such craft.

GEM Car: Any GCV which uses air cushioned suspension falls into this category. These craft tend to have a 'skirt' of some flexible material around the bottom of the vehicle to better contain the air cushion. If this skirt is severely damaged the air cushion will not function properly, greatly hampering the craft's maneuverability.

Gravitic Car: The highest technology personal land conveyance medium, such vehicles have a built-in stabilized gravitic field which holds them suspended above any solid (or, if so programmed, liquid) surface. Lateral power is usually provided by compact, quiet turbofans for slower (under 100 KPH) vehicles, while jets or even small rocket engines are used on high-speed craft.

AFV's:

Complete interior atmospheric control is assumed in these vehicles (heat/cool, humidity and full atmosphere for 1 day per person standard). These machines can function equally well in almost any extreme of environment as long as there is a sufficient gravity well and relatively solid ground (GEM of course requires a certain atmospheric density).

All are equipped with visual scanners, Sensors with 100 km range, 1000 km range com unit, and a MK. 30 computer (software extra). See specific models on costs chart (3.43) for various weapons and shields.

Wheeled/Tracked AFV: Often the heaviest of the fighting vehicles, these are propelled on protected wheels or wheels within flexible, treaded tracks which provide greater traction on uncertain terrain.

GEM AFV: These are more maneuverable, but usually lighter than the above AFV because of the enormous power expenditure to lift the machine. GEM AFV's are uncommon, mainly because it is difficult to protect the delicate lifting fans and skirt adequately.

Gravitic AFV: Very fast and maneuverable yet easily defended craft, these are truly formidable fighting machines. Because the gravitic field net can be imbedded in the armored shell of the vehicle, the entire craft can be fully protected. Their main weakness is instability: when hit by powerful concussive blasts they do not remain as stable as the wheeled/tracked version, tending to wobble and veer, making weapon targeting difficult.

Armored Walker: Also very maneuverable, these vehicles are usually conveyed by four to six "legs", computer coordinated so that the machine literally walks over uneven terrain. These are more stable than gravitic craft, but slower; and the legs are somewhat vulnerable to damage.

Explorers:

These have full environmental control for 10 days per passenger (minimum) and are equipped with 3000 km/orbital com units, 200 km range Sensors, visual scanners, viewports, and an Mk. 40 computer.

Exploration Walker: Similar to the Armored Walker, this vehicle is unarmed and less well armored, sacrificing that mass for research-oriented equipment.

GEM Explorer: As the Expolaration Walker is to the Armored Walker.

Gravitic Explorer: In addition to having less armor this craft has a variable altitude capability, able to rise up to 100 meters before encountering stability problems.

3.412 Marine Ships

Although called *marine*, these craft are appropriate for navigation through any liquid material which would not prohibit such travel for some other reason. The correctly designed craft, for instance, might employ hydrofoils to travel through the liquid hydrogen of Jupiter's 'atmosphere'.

Open Speedboat: Unprotected standard craft, powered by a hydroprop.

Open Airboat: Built to skim the water's surface, this open-air craft is propelled by one or more large fans which push the vehicle forward. This craft is ideal for shallow or viscous liquid.

Open Hydrofoil: the passenger area of this ship is either completely open or protected by a limited-environment control cabin. It is basically a large speedboat with collapsible foils which engage when the craft attains a certain speed (about 50 kph) lifting it out of the liquid and allowing for greater velocity.

Exploration/Xenoenvironment Hydrofoil: Much larger than the open version, with an interior environment completely controlled. Such a craft might have exploration equipment or be for travel between floating stations on a planet of non-Terran environment (such as a Gas Giant).

Hydroskimmer: An improvement on the hydrofoil design, though only practical for very small, high-speed designs.

Research Submersible: Small, relatively slow underwater craft, fitted with exploration equipment like the Explorer craft above. These are capable of submerging into liquids where pressures far exceed even the deepest oceans of Terra. Basically short-mission craft.

Exploration Submersible: Larger, more long-range than the Research subs, these vehicles are usually also equipped with high-speed submersible functions such as an aerofilm or electrostat fields to reduce liquid friction to a minimum.

3.413 Aircraft and Small Spacecraft

Embracing atmospheric as well as small N-space craft, this section includes all vehicles whose main mode of travel is independant of any solid or liquid environment. Naturally, prop craft require an atmosphere through which to pull the ship; and jet propelled aircraft require the appropriate oxygen/nitrogen atmosphere. Shuttles, SMAC fighters and other N-Space craft are all capable of atmospheric travel and ground landing unless otherwise noted.

AIRCRAFT:

Helicopter: A highly maneuverable though fragile vehicle which is lifted and moved laterally by use of a large overhead rotor (or rotors). These require an atmosphere to operate.

Prop Plane: Utilizing wing surfaces for lift and stability, these craft are propelled by forward-facing rotors. They require an atmosphere to operate. It should be noted that such craft are often preferred over combustion jets in **Space Master** because they can be powered by clean electricity, and are more efficient and, with new alloys and aerodynamics, can move almost as fast as most such jet craft.

Gravprop Plane: Identical to the prop above except that it is capable of vertical liftoff and landing because of gravitic lifting boost. This also reduces energy consumption to maintain the plane's altitude. Wings are smaller, and the craft is capable of greater speeds. These require an atmosphere to operate.

High-speed Jet: Used for long-range planetary travel where suborbital flight is impractical, these craft are extremely fast. They require an oxygen-nitrogen atmosphere to operate.

Gravitic Belt: Not so much a vehicle as a personal device, the gravitic belt is a small gravitic genenerator strapped to the back with a wide belt. From the generator, control appendages extend forward to a position convenient for the wearer. The belt is capable of full lift and maneuverability.

Gravitic Sled: An open sled-like machine, the gravsled has seating for two in tandem, with small storage areas under the seats. The sled, like the belt, is capable of full lift and maneuverability.

Gravitic Flitter: Coming in a variety of forms from recreational to exploration, these work on the same principle as gravitic cars, except that their vertical lift is much more powerful and can be manually controlled, allowing the craft to fly at altitudes of even kilometers. They are not as fast as some planes, but very maneuverable and ideal for light survey/exploration work.

Suborbital Shuttle: With complete interior environmental control, these vehicles are designed for very swift planetary travel. Usually rocket powered with gravitic lift, they rise to suborbit level and make most of the journey at high speed where there is little atmosphere to create friction.

SPACECRAFT:

Maintenance Pod: A very small craft powered only by thrusters and incapable of atmospheric maneuvering. Used for repairing ships in spacedock or other stable, orbit situations. They are equipped with a standard docking collar and have full interior environment control.

Orbit Shuttle: Designed for ground-to-orbit transfer of passengers and supplies, these ships are rocket-powered with gravitic lift for landing and takeoff. They are equipped with a standard docking collar and have full interior environment control.

Courier Shuttle: For interplanetary journeys, these ships are capable of landing on most planetary surfaces and have powerful N-Space engines for swift travel. Like the shuttle above, they have a standard docking collar and full interior environment control. Storage for supplies to sustain each passenger for 5 days.

Hypershuttle: Primarily for short interstellar journeys, Hyper-shuttles are light, fast vehicles designed to transport personnel or materials as quickly as possible. Like the other shuttles, they have no armament and possess only navigational deflectors, not useful in combat. They possess the usual standard docking collar and full interior environment control, and have a capacity to carry supplies for twenty days per passenger.

SMAC Fighter: These vehicles are small but swift and equipped with powerful weapons. Some have shields, but others even forgo this protection to allow for more deadly armament. SMAC's usually use energy weapons because of their lower mass. They usually have full interior environment control but only space for one pilot/gunner (some have Robot interface capability). These machinices of war have gravitic landing capability, but usually operate from a large 'carrier' ship nearby, as SMAC's are very short-range.

3.42 VEHICLE POWER SOURCES

The cost on this chart is multiplied times the Cost Factor on the Vehicle Costs Chart to determine the price for the power source desired. This is added to the cost listed under the Vehicle Cost to achieve the total cost for the vehicle.

Cost (Elmonits)	Notes
100	Batteries: 10 hours full power before recharge.
200	Batteries: 20 hours full power before recharge.
500	Combustion engine: 50 hours full power before refueling. (20 liter tank).
1000	Combustion engine: 100 hours full power before refueling. (40 liter tank).
1000	Capacitors: 100 hours power before recharge.
1500	Capacitors: 150 hours power before recharge.
5000	Fusion Reactor: 10 days power before refueling. (1 liter tank).
30,000	Fusion Reactor: 100 days power before refueling. (10 liter tank).
50,000	Fusion Reactor: 10 days before refueling (1 liter tank; can be refueled with distilled water)
60,000	Matter/Antimatter Reactor: 200 days power before refueling (1 liter magnetic bottle).

Note: The energy expenditure assumes full operational status, and consumption would be much lower if the craft were not moving, or if only a few systems were operational. The GM must evaluate the situation and rate fuel consumption as appropriate.

Fuel Costs are very general and can vary tremendously — or might be unavailable — dependant on local technology level. Note that all fusion reactors have to be refueled with deuterium by a qualified Power tech in a shop, except the one which can be refueled in the field by simply adding 5 liters of distilled water. Fuel tank size should be multiplied times the cost factor as well to determine actual fuel tank size for the vehicle.

3.43 VEHICLE COST CHART

VEHICLE TYPE	MOTIVE FORM	PSNGRS	CARGO	ENVIR	MASS	CAT	(DB)	ARMAMENT	MI	PWR X	COST
Cars											
Wheeled Sedan	M Wheel	5	3	semi	2	22	(20)	—	N	1	5,000
Wheeled Truck	M/S Wheel	2	60	semi	25	22	(10)	—	N	5	20,000
Wheeled Van	M Wheel	8	6	semi	10	22	(15)	—	N	2	10,000
Wheeled Sports Car	F Wheel	2	2	semi	2	22	(30)	—	N	2	8,000
GEM Sedan	M GEM	5	4	semi	2	22	(30)	—	N	2	8,000
GEM Truck	M/S GEM	2	50	semi	20	22	(20)	—	N	8	32,000
GEM Van	M GEM	8	6	semi	10	22	(25)	—	N	4	16,000
GEM Sports Car	F GEM	2	2	semi	2	22	(50)	—	N	5	15,000
Gravitic Sedan	M Grav	4	2	semi	2	22	(35)	—	N	2	15,000
Gravitic Truck	M/S Grav	2	50	semi	20	22	(25)	—	N	10	60,000
Gravitic Van	M Grav	8	7	semi	8	22	(30)	—	N	5	30,000
Gravitic Sports Car	F Grav	2	2	semi	2	22	(60)	—	N	5	25,000
AFV's:											
Trojan 37	S Track	3	2	semi	30	24	(60) *40	1 Mk10 Laser (10)	N	20	100,000
Conqueror III	M Track	4	2	full	50	25	(70) *50	1 Mk10 Blstr (20) 2 Mk5 Laser (5)	W	30	150,000
Puma IV	S GEM	4	2	semi	40	23	(40) *30	2 Mk8 Dsrptr (8) 2 Hvy Mchn Gn (#)	N	30	200,000
Panther	M GEM	2	3	full	20	23	(50) *20	1 Mk5 Laser (10) 2 Hvy Blstr (#)	N	20	180,000
Dominator	S GRAV	4	4	full	60	25	(60) *40	1 Mk10 Laser (20) 3 Hvy Blstr (#)	Y	35	250,000
Spartan VI	M GRAV	5	4	full	70	25	(80) *50	2 Mk10 Ion Cn (10) 4 Mk2 Laser (2)	Y	40	300,000
Explorers:											
Exploration Walker	Walker	6	10	full	50	23	(20)	—	N	15	50,000
GEM Explorer	M GEM	8	8	full	30	23	(10)	—	N	10	40,000
Gravitic Explorer	M GRAV	6	4	full	15	22	(20)	—	N	10	65,000
Marine Craft:											
Open Speedboat	F HYPROP	4	2	none	1	21	(20)	—	N	1	4,000
Open Hydrofoil	F HYFOIL	4	2	none	3	22	(30)	—	N	2	15,000
Seascout (explorer)	S HYFOIL	6	10	full	18	22	(20)	—	N	10	50,000
Discovery II (explorer)	F HYFOIL	8	12	full	25	23	(40)	—	P	20	60,000
Hydroskimmer	HYSKIM	2	2	full	3	22	(40)	—	N	5	60,000
Research Submersible	S SUBM	2	2	full	4	26	(10)	—	N	2	30,000
Exploration Submers.	F SUBM	6	10	full	18	25	(20)	—	N	15	100,000
Aircraft:											
Helicopter											
1-man	S PROP	1	.5	none	1	21	(30)		N	1	6,000
2-man	S PROP	2	1	semi	2	21	(30)		N	3	15,000
Prop Plane											
2-man	M PROP	2	1	semi	1	21	(20)		N	3	12,000
4-MAN	M PROP	4	2	semi	3	22	(20)		N	5	25,000
Gravprop Plane											
2-man	F PROP	2	2	full	2	21	(30)		N	4	50,000
4-man	F PROP	4	4	full	5	22	(40)		N	8	90,000
High-speed Jet											
4-man	F JET	4	4	full	6	22	(30)		P	10	110,000
8-man	F JET	8	10	full	15	23	(40)		P	18	250,000
Gravitic Belt	S GRAV	1	0	none	.005	N/A			N	.5	3,500
Gravitic Sled	M GRAV	2	1	none	.5	21	(20)		N	1	12,000
Gravitic Flitter											
2-man	F GRAV	2	3	full	1	22	(30)		N	6	80,000
6-man	F GRAV	6	4	full	4	22	(30)		P	18	200,000
10-man	F GRAV	10	6	full	12	23	(30)		P	30	500,000
Suborbital Shuttle											
6-man	FUSION RCKT	6	10	full	20	23	(50)	*30	P	30	800,000
20-man	FUSION RCKT	20	25	full	75	23	(50)	*30	P	100	3,000,000
Small Spacecraft:											
Maintenance Pod	N-Space Thrstr	2	2	full	3	21	(10)		N	1	30,000
Orbit Shuttle											
6-man	FUSION RCKT	6	10	full	25	23	(50) *30		P	40	1,000,000
20-man	FUSION RCKT	20	30	full	90	23	(50) *30		P	120	3,600,000
Courier Shuttle	N-Space Rtg 15	4	10	full	100	22	(90) *50	—	P	200	1,000,000
Hypershuttle	N-Space Rtg 10/ TLD Rtg 12	6	12	full	150	22	(90) *50	—	P	300	1,500,000
SMAC Falcon	N-Space Rtg 17	1	1	full	36	22	(120) *50	1 Mk10 Laser (10)	P	30	500,000
SMAC Hawk	N-Space Rtg 15	1	1	full	44	22	(100) *40	2 Mk10 Blstr (10)	P	25	450,000
SMAC Eagle	N-Space Rtg 15	1	1	full	50	22	(130) *50	2 Mk10 Laser (15)	P	35	650,000

KEY:

MOTIVE FORM: refer to the Vehicular Movement Table (4.24) for the explanation of these terms. For the spacecraft, the N- Space rating refers to # of picks in ship construction process, sec. 4.211. Same for Translight Rating.

PSNGRS: indicates the number of persons the vehicle is designed to carry comfortably — including pilot and crew. In an emergency each cumet of cargo space could be used for 'passengers', but only for limited periods, as it overloads the environmental control systems.

CARGO: additional cargo space available, in cubic meters (cumets).

ENVIR: amount of interior environmental control: *none* means that either there is no cabin or that the cabin has no atmospheric control; *semi* means that the cabin is enclosed but not necessarily sealed, and provides heat/cooling and some humidity control; *full* means that the cabin is completely insulated and sealed, and is equipped with complete environmental support.

MASS: mass of the craft (empty) in tons. The number in parentheses is the number of hits it can take (using the mounted weapons attacks) before it is disabled. If no number in parentheses, the tonnage equals hits. Against handheld weaponry multiply the number of tons times 10 to determine the number of hits the vehicle can withstand. See also the Vehicular combat rules, section 6.3 for rules on using handheld weapons against vehicles.

AT (DB): The Construction Armor type is listed, with the standard Defensive Bonus (DB) in parentheses afterwards. "'x'" indicates a barrier energy shield of "'x'" DB value, included in the total DB.

ARMAMENT: Any and all armament. The total Offensive Bonus (OB) for each weapon type is in parentheses. This is in addition to any Gunner or HUD bonus (A HUD may be added if desired; see sec 4.211, Starship Design, for cost details). A "'#'" indicates that this weapon is found on the Master Weapons Chart (5.6) and as an antipersonnel weapon should use those rules.

MI: indicates whether the craft is equipped with a Mech Interface terminal for a robot. The space either has an "'N'" (for "'no interface'", or one or more of the following: "'P'" (Pilot Interface), "'W'" (Weapons Interface), "'S'" (Sensor Interface). "'Y'" indicates that there is a multi-use interface, capable of any of the above.

PWR X: the multiplier to be applied to the power source cost once a Power source/Energizer has been selected (from chart 3.42) for the vehicle). Use common sense when selecting a power source; do not buy a combustion engine for a SMAC fighter, for instance. Such machines require a fusion reactor.

COST: the average cost for the vehicle, in Elmonits (not including the Power source/Energizer).

3.5 SOME SPACECRAFT DESIGNS

On the next few pages are shown views of three fairly typical small spacecraft designs: one SMAC Fighter, a 1000 ton explorer Starship (what the **Flying Merino** might look like — see section 4.21) and a 20,000 ton Imperial Scout/Light Gunship.

The Flying Merino

ORIGIN/OWNER: Jym-bob Myllyr

CLASS: Explorer/Scout

PRICE: (completed) 5-7 million Elmonits

TONNAGE/HITS: 1000

COMP. SIZE: 70

ARMOR TYPE: CAT 23 (+10)

CREW: (Astro: 3 Technical: 6)

MAX SUBLIGHT ACCELERATION: 110 km/second

TRANSLIGHT DISPLACEMENT: 10 LY/day

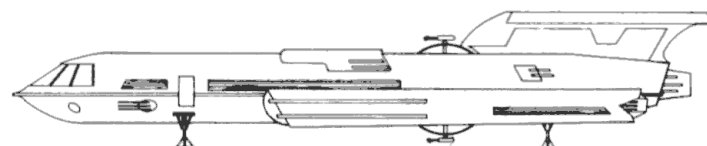
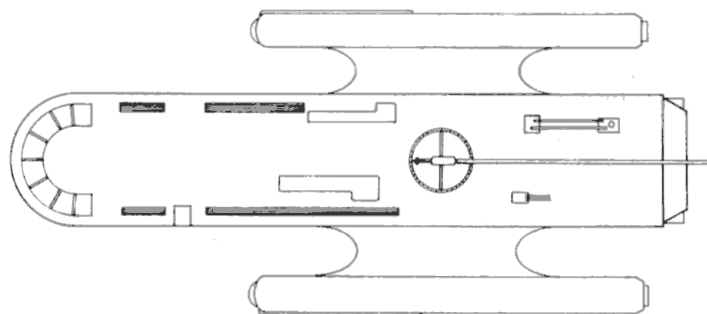
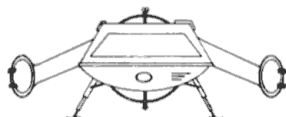
(Screens + Pilot + Evade + EW - Encumbrance)

TOTAL DB: 50 — — — 0

GUNS:	Type	Mk.#	Number/Location
	Laser Cannon	10	2 Top and bottom turrets
	M/A Torp	20	2 Front and rear tubes

TOTAL OB: (Gunner + Predict + HUD) Mk. #

Lasers	—	—	—	10
Torps	—	—	—	20



SMAC Falcon

ORIGIN/OWNER: Imperial Strike Fighter

CLASS: Predator VII

PRICE: (completed) 500,000

TONNAGE/HITS: 16/36

COMP. SIZE: 10

ARMOR TYPE: 23

CREW: 1 Pilot/Gunner

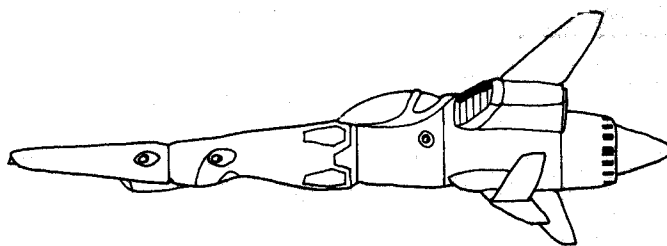
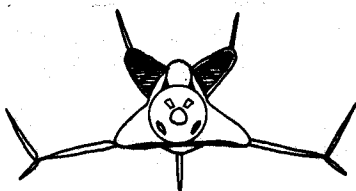
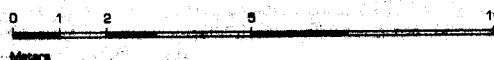
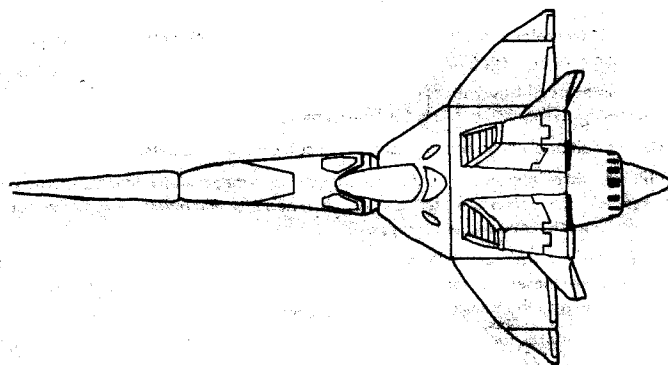
MAX SUBLIGHT ACCELERATION: 135 km/second

(Screens + Pilot + Maneuver)

TOTAL DB: 50 — 30

GUNS:	Type	Mk.#	Number/Location
	Laser Cannon	10	1 Front

TOTAL OB: (Gunner + HUD) Mk. #
— — 10



The Rising Star

ORIGIN/OWNER: House Carlisle

CLASS: Light Gunship

PRICE: (Completed) 50-80 million Elmonits

TONNAGE/HITS: 20,000

COMP. SIZE: 120

ARMOR TYPE: 24 (+10)

CREW: (Astro: 15 Technical: 30 Gunnery: 10 Misc: 20)

MAX SUBLIGHT VELOCITY: 100 km/sec

TRANSLIGHT DISPLACEMENT: 12 LY/day

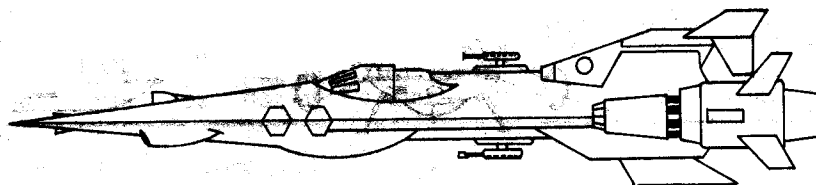
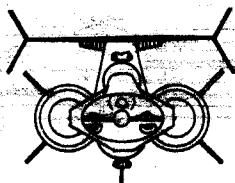
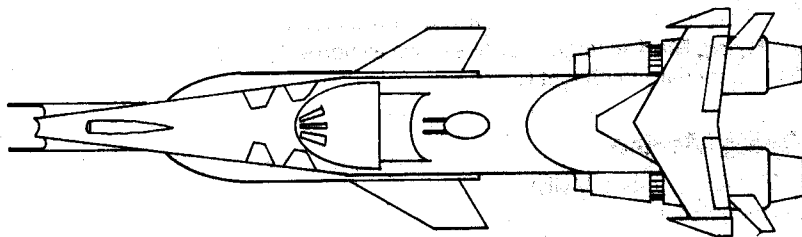
(Screens + Pilot + Evade - Encumbrance)

TOTAL DB: 60 — —

GUNS:	Type	Mk.%	Number/Location
	Laser Cannon	20	4 2 top, 2 bottom
	Ion Cannon	30	1 nose (forward)
	Torp Tubes	20	2 forward

(Gunner + Predict) Mk. %

TOTAL OB: — — 20
— — 20
— — 30



4.0 ITEM CONSTRUCTION AND RESEARCH

Before delving into this section a review of the definitions in section 3.31 is strongly advised. This will hopefully clarify the potentially confusing terms used frequently below. In addition, a few other terms are described here:

AFV: (Armored Fighting Vehicle) A machine whose mode of travel is primarily overland, and is designed for combat or combat-support functions. Always armored; usually armed with mounted weapons.

GCV: (Ground Conveyance Vehicle) A machine which requires a solid surface on or above which to operate, whether it be wheeled, tracked, gravitic, etc.

SMAC Fighter: (Singly Manned Attack Conveyance) Fighters are a classification of small, highly maneuverable ships with a single pilot/gunner designed primarily to assault other space vehicles. Some are capable of in-atmosphere flight (and so attack planetary defenses) and landing. Most are short-range, possessing no hyperspace travel capability, and have only a small cockpit with limited pilot mobility potential. The emphasis is on sublight speed and maneuverability, and high-output weaponry.

USING THE CONSTRUCTION/RESEARCH CHART

Most construction and research ultimately refers to the Construction/Research chart, sec 4.6, and/or other charts at the end of section 4.

The construction and research chart, like the maneuver charts, has a number of different "Difficulty Ratings", from Routine to Absurd. The appropriate difficulty must be assigned by the GM before a roll is made, with additional modifiers if applicable. By glancing over the table one can see that the majority of the boxes have two numbers: the top one indicates — for research — the percentage of total desired research data acquired after the effort represented by that particular roll; for construction it indicates the percentage chance that the item will function properly initially after construction. Obviously, a test after the roll will reveal whether or not the item operates, though that can become involved (or even dangerous) with complex machines/organisms. It is suggested that in the case of organisms such as Replicants and Clones that the PC be instructed to roll until a 100% total accumulated chance of success is achieved (or utter failure, or the creator gives up). If the item fails, successive rolls with a cumulative chance of success are permitted. The second number in each box on the chart indicates how much time is expended to achieve the result.

NOTE: Research is done using Scientific skill bonuses; Construction is done using Technic skill bonuses. If a project seems to fall under more than one skill category, average the appropriate ones to get the skill bonus to be applied.

DIFFICULTY RATINGS:

When assigning difficulty, a few general guidelines should be kept in mind:

Routine: Is for very simple operations only, such as improvising wiring on an available generator to recharge an energy cell, or assembling a simple, modular device. With regard to research, this applies to checking one straightforward reference.

Easy: Applies to most elementary construction tasks, assembling a small apparatus with pre-made parts, for example. Research is slightly more involved than one reference; perhaps two or three sources need to be checked for 100% completeness.

EXAMPLE: Sanvok has a 40 bonus in Weapons Technology, and decides to take his Laser Pistol apart and put it together again (just for kicks). The GM determines that this is "Easy", and Sanvok rolls a 27 (plus 40 = 67). A 67 result in the easy

column says that, after ten minutes the Laser Pistol is to the point where there is a 95% chance that it will operate correctly. Sanvok tests it — probably by shooting at something. He rolls an 03 (Note that this roll is **unmodified** and NOT open-ended). The Laser Pistol fails to work. He rolls again on the Easy column, getting a 67 (total, including bonus: 107). This reports a 99% after one more minute. The percent is cumulative, so there is a 100% chance the item now works. (Of course, there is still always the chance that the pistol will malfunction in normal action, as reflected in the **Failure** range of the weapon chart.)

Moderate: For slightly more sophisticated operations, yet still in the 'simple' range.

EXAMPLE: Norvin, in his fully equipped workshop, decides to build a small power cell recharge device to run off his portable fusion reactor, so its easier to recharge his Blaster Rifle Power Packs. Abruptly he realizes (i.e., the GM tells him) that he has no idea of the specifics of the voltage/wattage of the Power Pack or how to alter the current. He goes to the handy Reference Computer (not necessarily a feature of a workshop, but invaluable for research) and calls up the Engineering Technical Reference Memory. The GM decides that all the data required for reasonable success in this operation will probably have to come from three or four sources (Power Pack specs, Portable Fusion Reactor specs, and current alteration details). He informs Norvin that this is a **Moderate** Research project. Norvin has a 60 skill bonus in Electronics and a 40 skill bonus in Power Systems Theory as Scientific Skills (the GM having determined that this is a Electronics and Power Systems Theory project, since the weapon itself really has little to do with it, Weapons Design is not applicable) so Norvin's net add is 50 (average of 40 and 60). Norvin rolls a 78 ($78 + 50 = 128$). 128 cross-indexed on the chart reveals 100% completion in 30 minutes. Thus, Norvin gleans all the necessary information he needs in half an hour. The next step is actual construction, which requires the appropriate Technics skills. Once again, Electronic and Power Systems Technics are involved. Norvin bonuses in these are both 40, so the average is (not surprisingly) 40. Norvin's shop is, as we have noted, fully equipped, so the GM need not impose additional penalties for insufficient equipment and supplies. The GM determines that this operation is also **Moderate**. Norvin rolls 56 and adds his 40 bonus = 96. The result on the table reveals that after 45 minutes, Norvin has completed the project to the point where there is a 95% chance that the device will work. Norvin tests it, and rolls an 87 (well above the required 06+). It works (and will continue to work, under normal operation/malfunction rules).

Hard: To be used for more complicated construction, perhaps involving the custom tooling or wiring of a complete unit; or simple organism synthesis (such as reproducing a drug). Also for the lower range of involved research or a creative design.

Complex: Appropriate for Cloning, non-experimental Replication, and extended Eugenics planning. Also used for creative micro-organism work (based on comparable research) and the construction of relatively basic new devices from 'raw' materials — a different type of multiscanner, for instance (again, based on comparable successful research). Detailed research with possible numerous cross-references uses this column.

Very Complex: This column should be used for Construction of sophisticated new systems and new types of Alterant Replication (based on research) and extremely detailed research, with at times unclear data.

EXAMPLE: Trevoc, after successfully completing research on creating a special Alterant Replicant with superior night vision, goes to his fully equipped lab and begins the necessary chromosome and gene alteration on the Replicant fetus. He rolls a 76, plus his 60 Genetic Engineering bonus, a total of 136. On the Very Complex table, the result is 50% complete after 57 days. He rolls again: 89 (plus 60 = 149) the result is an additional 50% (bringing his total to 100%) and an additional 53 days of work. Thus, the fetus is altered and developing in the growth tank after 110 days of work. Note that this does not include the 100 days while the fetus is in the tank, growing to maturity. See sec 4.32 for more details on Replication and Cloning.

Absurd: Use this column for things which would normally be Hard to Very Complex, but when there are important facilities/supplies unavailable. Caution is advised, however. Even in the universe of Future Law, some things are "impossible", and if the GM deems something to be impossible, he should say so rather than allowing a roll.

EXAMPLE: Trevoc, with his total Genetic Engineering bonus of 60, and has gathered all the chemical components of the human body (water, salt, various trace metals, etc.) and announces to the GM that he wishes to create a Replicant, using no equipment. This, of course, is **beyond** Absurd; the GM calmly and reasonably informs Trevoc that unless he acquires the proper materials and equipment, he cannot even attempt the task. (Then the GM goes home and screams.)

GENERAL FACTORS

Once a column has been selected reflecting the empirical difficulty of the project, a few general factors are very important to consider, and to represent these, a numerical modification to the roll is suggested.

— If research:

Are there adequate information sources available for the data-gathering in question. Or has some vandal stolen the needed volume?

Suggest:

Full data: +/-0; Near Full -20; Partial: -30; Fragmentary: -50

Is the environment conducive to research (no interruptions)?

Suggest:

Quiet: +/-0; Rare Distractions: -20; Noisy: -30; Disruptive: -50

Is the data appropriately recorded so that, when used, it will be accurate?

Suggest: (storage type)

Datadisc: +/-0; Tapes: -20; Written Text: -30; Disorganized format: -50

— If construction:

Are the tools and facilities available the appropriate ones?

Suggest:

Complete Equipment: +/-0; Near Complete -20; Partial: -30; Sorely underequipped: -50

Are there adequate materials, and are they of suitable quality?

Suggest:

Complete: +/-0; Near Complete -20; Partial: -30; Wanting: -50

Is the environment suitable and conducive to the delicate work involved (i.e., not aboard a small spaceship under attack or a town during an earthquake)?

Suggest:

Quiet: +/-0; Rare Distractions: -20; Noisy: -30; In Motion: -50 — -100 (varies).

Are the plans/instructions/source data complete and accurate?

Suggest:

Full data: +/-0; Near Full -20; Partial: -30; Fragmentary: -50

The research/construction roll(s) are made and modified by these factors as well as the PC's skill rank in the appropriate area. For very complex machines, several rolls should be made: one for each system, each possibly with different modifiers and complexities. See section 4.4 for details on construction and research by groups.

It is important to be aware at all times the cost of materials. In the Example above, Norvin was able to build his recharge device because his workshop was "fully equipped". This of course meant that it was fully stocked with the tools and materials needed. After the device is built, the workshop is no longer "fully equipped", and Norvin will have to pay a certain amount to restock it. This involves a determination of the *Cost in Parts*. This important concept comes up in all types of construction, and repair of devices when they are seriously damaged. Naturally a complete price list of all conceivable mechanical and electronic parts would be tedious and extreme, so it is suggested that the GM review the general price lists and estimate a cost value. Remember that a *Cost in Parts* is about half the cost of an assembled machine or device (due to cost of labor, equipment, etc). Therefore, if PC's have the time and skill, they can save themselves a heap of Elmonits (or even go into business...).

4.1 WEAPONS/SMALL DEVICES

Perhaps the most straightforward of the construction operations, these are normally handled with one roll. Standardized parts and other construction materials are readily available in most areas of reasonable technology, so construction, with proper instructions, should rarely be more than **Hard**.

4.2 SHIPS, VEHICLES, ROBOTS, AND ANDROIDS

4.2.1 STARSHIP CONSTRUCTION

This section provides detailed rules for the creation of faster than light and other relatively large long range ships. Use these instructions in conjunction with the Starship Parts Cost (section 4.212) and Ship Design Worksheet (section 4.213) tables. See section 4.22 to design shuttles and small, short range fighters.

Immediately below are a few definitions used in the design process.

DEFINITIONS:

CAT: Construction Armor Type. This refers to the ten **Space Master** Armor Types created for vehicles and ships which have armor far superior to anything conceptualized in **Rolemaster**. Construction Armor Types are numbered 21-30, not necessarily implying a direct progression, but to indicate a superiority to the RM Armor Types 1-20.

Cumet: Cubic meter.

DB: Defensive Bonus — the same concept as that used in personal combat, reflected as a subtraction from attacker's OB (Offensive Bonus).

ER: Energy Rating — a term to designate the power requirement (or output) of a given facility.

FTL displacement: Faster Than Light displacement — the distance a starship travels through Hyperspace in a given period of time.

Hypershunt: A term describing the actual transfer of a vehicle into Hyperspace. All travel in Hyperspace is measured via FTL displacement rather than 'velocity'. It is referred to as a 'shunt' because of the high-acceleration boost necessary for feasible FTL travel.

M/A: Matter/Antimatter — relating to a power source derived from the mutual annihilation of certain particles of matter and antimatter.

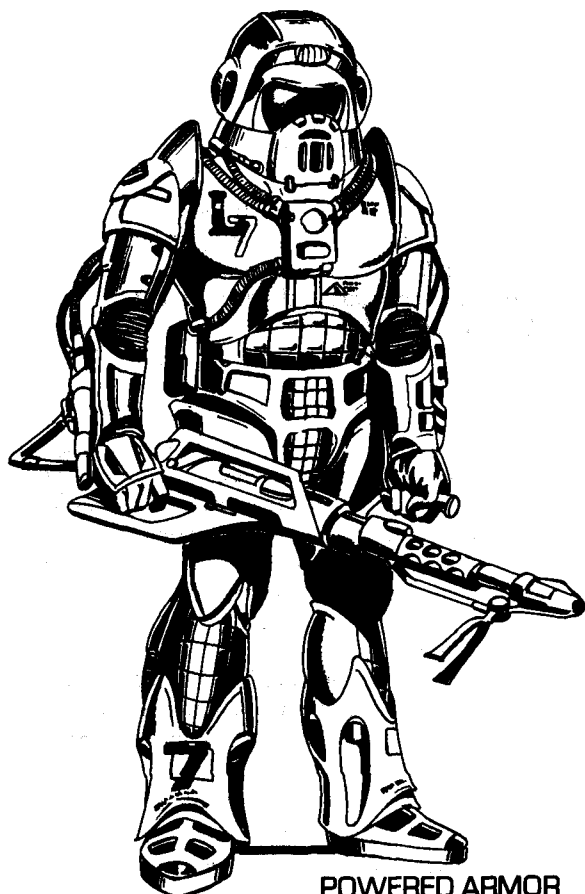
N-Space: Normal Space — as opposed to the interdimensional realm of Hyperspace.

Rating Pick: Gradients of power / speed / protection / sophistication of certain systems. The concept is based on discreet units of differing value, similar to the **Rolemaster** skill development system. Unless otherwise noted, the first ten Rating Picks provide a +5 bonus per pick, while the next ten give a +2 bonus per pick, picks 21-30 are worth 1 point each, and all others afterward are worth 1/2 point per pick. The point value declines even though the cost remains the same. See specific references in the rules for individual exceptions.

RIF: Relative Inertial Field — necessary for hyperspace travel, it suspends certain relativistic and inertial physical properties.

Standard Day: The standard galactic day in **Space Master** is 25 hours long — the time found to be most natural for human circadian rhythms. Hours and minutes remain intact from Old Terra timekeeping.

TER: Total Energy rating — the total of the combined Energy Ratings of certain facilities.



POWERED ARMOR

4.211 Design

A few elements of Starships in **Space Master** are assumed here, assumptions which deserve elaboration.

The Relative Inertial Field (RIF) Generator

The interdimensional state known in the vernacular as Hyperspace can only be achieved by a craft enclosed in a *Relative Inertial Field*, which annuls the normal effects of relativity and inertia for all things within the field relative to outside space. Even ships equipped with a fusion drive can theoretically Hypershunt — which occurs automatically when a craft exceeds the speed of light — if they have an operational RIF generator. However, Hypershunts via such a low-power drive are slow and erratic. Only a Matter/Antimatter drive can shunt a ship through Hyperspace with any significant speed. If a GM wishes, however, he could incorporate ships with only fusion power. If so, it is suggested that the FTL (faster-than-light) displacement rating for a fusion engine be one-tenth that used below.

The Matter/Antimatter Translight Drive

A completely different concept from the reaction drive, Translight engines propel the ship instantaneously into another dimension: Hyperspace, where normal physical laws do not operate. Immediately upon the activation of the Translight drive, the ship leaps into Hyperspace; there is no acceleration. This is why a tremendous initial burst of power is required, and continuous thrust is also required. The RIF generator is also necessary, to prevent the inertia which would normally accompany such a shunt from crushing the ship like a beer can — not to mention flattening the occupants to messy protoplasmic pancakes.

One common design for such an engine, because of the necessary funneling of immense energies, is often a roughly cylindrical nacelle (the number per ship can vary, although two or three are most common) separated from the body of the ship. This is especially important because M/A engines have been known to overload and self-destruct. If thus separated, they can be easily jettisoned — if, for example, an overload is imminent. Also, the release of hard radiation from the fissioning of the outer, normal atomic structure (see sec. 3.0, Machines), is kept apart from the ship, and less shielding is necessary. Because of their already more sophisticated safeguards, reactors are less prone to overload unless damaged severely, and, due to their lower power output, require less shielding. At an additional cost for superior shielding, the engines can be integrated into the ship's main hull. Several designs — frequently warships — incorporate this method.

Reactor/Energizers

In addition to a RIF generator and a Translight drive, a starship requires an Energizer (also called a reactor), which powers all of the ship's facilities (the RIF generator, shields, weapons) as well as 'igniting' and maintaining drive systems. If Matter/Antimatter power is used for the Translight Drive, the most efficient Energizer is also of this type, which can tap into the same fuel supply as the Translight drives.

Sublight Drive

To maneuver inside a planetary system, a sublight drive is also needed. For example, entering and leaving Hyperspace while within a star gravity well is extremely dangerous. This is because of the relative density of debris and the gravity of the star itself. Debris is dangerous because the ship's screens could not deflect all of it, and the ship could quickly resemble metallic swiss cheese. Gravity is a peril because the sudden lurch (shunt) could overload the RIF generator as it attempts to counter the combined gravitational/inertial effects. If this occurs, the ship would be torn apart by the sporadic application of inertia as the field collapsed around it — a very messy prospect.

Fusion is quite suitable for such a sublight drive, mainly since M/A drives are not easily controlled at sublight speeds. Also, a feature known as a *Ramscoop* can be utilized. A Ramscoop is a cone-shaped electromagnetic field extending in front of the craft, scooping up interplanetary hydrogen, used to fuel the fusion drive. (Thus, very little hydrogen fuel need be carried.) It should be noted that ramscoops are inoperable at FTL speeds — another point against fusion Hypershunts, since bulky hydrogen fuel must be carried on the interstellar trip.

Other facilities on a ship are more-or-less optional: deflector shields (beyond the minimal ones required to protect the ship from debris), Stealth screens, weapons, labs, shuttle bays, etc.

A STEP-BY-STEP GUIDE TO STARSHIP CONSTRUCTION DESIGN

This is probably the most complex operation in the entire system and some juggling will be necessary to get the right balance, but the result will be a cohesive feasible design. Two important things to keep in mind are **Volume** and **Cost**. Once you select your intended ship volume, everything has to fit inside it (naturally). Problems arise, for instance, when you install huge, powerful Hyperspace Shunt engines, then find you have no room for the reactor! Worse yet, you buy the engine, and have no money to buy shield or weapons. That's why the worksheet is a worksheet. Some math is involved, even a square root or two (sorry!), so have your calculator or scrap paper ready. To help out, examples (our astro-guinea pig, Jym-bob the hick from a backwater farming planet, designs a starship) are included after every step. Read over all the instructions before you begin, noting the facilities you wish to include. Fill in your prices and volumes (in pencil!) as you go. Round off to the nearest cubic meter (cumet) when necessary.

A final note: single numbers in a formula in parenthesis: "(3)" for instance, refers to the amount derived from the step of that number!

(1) Select ship displacement in (metric) tons. As a general guide, one-man interstellar ships mass around 50-500 tons. Yachts and small survey craft with crews up to 10 mass 500-1000 tons. Scouts, gunships and small freighters mass 1000-10,000 tons. Small liners, support cruisers and average freighters mass 10,000-50,000 tons. Line cruisers, large passenger liners and small orbital stations are 50,000-100,000 tons.

EXAMPLE: Jym-bob decides to build a small explorer ship, (the Flying Merino) massing 1000 tons (a nice, round number).

(2) Volume = (1) x 3 cubic meters. This number is important to many of your subsequent calculations. When the expression (2) is used, it refers to this number.

EXAMPLE: $1000 \times 3 = 3000$ for Jym-bob's ship's volume.

(3) Bridge (control area) = square root of (2). "(2)" is the total volume from step (2), right? This reflects the volume necessary for control systems, monitor screens, conduit, etc.

The cost indicated here includes everything *but* the consoles. There must be a minimum of one for each Astronautic crew member [see step (5) below], and more can be added (as many as one extra for each necessary) at the same cost for additional operators (such as extra EW operators to enhance the EW flexibility; see below).

EXAMPLE: The square root of 3000 is (rounding off) 55. The cost for Bridge equipment is $55 \times 1000 = 55,000$.

(4) Computer = $1/10$ the Mk. of the computer in cubic meters. The Mk. (or Mark) number of your computer is its operating capacity (see computer program list) or the total volume numbers of the available programs which can be run simultaneously. The computer's storage capacity (not to be confused with its operating capacity) is twice the Mk. number. Some programs, such as data retrieval, have large storage volumes but take up relatively little space in the operating system because of their simplicity. Other programs, such as *Evade*, are very sophisticated and demand a large amount of the computer processor's operating volume to run.

EXAMPLE: Here we have to go to the Computer Program Descriptions (sec. 3.21) to figure out what programs we want. Take special note of the asterisked (*) programs, which do not have a fixed size (research programs; Predict, Evade, and Missile Targeting) but are variable depending on desired sophistication. Each unit of size equals a certain bonus, on the declining return scale (1st ten rating picks each add +5; second ten +2; 3rd ten picks +1; all afterwards are worth +½). Every Rating Pick, regardless of bonus value, takes up 1 storage unit in the computer, requires 1 rating number to run, and costs 500 credits — the soaring cost of software! Jym-bob, fearing a lot of combat, plans on ten rating picks each of Evade, Predict, and Targeting. This means that each program takes up ten storage space units and, when running, takes up ten units of space in the operating system. He also makes five rating picks in each of the exploration analysis programs (this is supposed to be an explorer ship). In addition, he picks the other programs marked on his Program list. To leave a little extra space for new data, as well as for his Stealth program (the size of which is yet to be decided), he opts for program spaces totaling 130. Referring to the rules on computers, note the Reserve Storage, which is ten times the Mk. number. Figuring (reasonably) that he won't need all of these programs running simultaneously (especially those bulky reference programs), Jym-bob opts for a Mk. of 70 — plenty of room to run most things at once. Jym-bob's computer volume is 7. Note that the actual computer volume is much smaller; most of this volume is access and maintenance machinery. His computer price tag is the base of 10,000 plus $(70 \times 1000) = 80,000$ Elmonits.

(5) Required Astronautic crew = square root of [(1)/100] (or 1, whichever is greater)

EXAMPLE: The mass, (1), of the **Merino** is 1000, so the square root of $(1000/100) = 3.162$. Jym-bob notes that three Astrogation/Piloting/Sensor crewmembers are necessary for normal ship operation. If there are fewer people than standard, increase all difficulties by one column. For severe shortages ($\times 1/4$ standard) increase two columns. Jym-bob now knows that he needs at least 3 bridge consoles, at a cost of 5,000 Elmonits each: 15,000 Elmonits. For a ship this size, the console designation is probably: one Piloting, one Communications / EW combination (assuming Jym-bob gets EW), and one Sensor / Astrogation control. He could buy as many as three more consoles without having to alter his bridge volume (and so can add them later). These could be Engineering (power and shield distribution) consoles and extra EW consoles for missile jamming, etc [See sec 6.13, and step (11) below]. He decides to punt these, however.

Important cost considerations for the Bridge are Sensors and Communications. They play no significant part in volume, because they are very compact in the high technology of **Space Master**, and their consoles have already been purchased. However, the additional equipment cost must be taken into account.

Sensors: (see sec 2.31 for details on Sensor abilities) Cost is a base of 2,000 Elmonits plus 500 per light year range. Range beyond 50 LY is not reliable.

Communications: (see 2.33) The cost and volume is the same for both Tachion Beam and Laser transmission/reception ability. Base cost is 1,000 Elmonits plus 200 per 1000 km Laser or 1 light year Tachion Beam. This includes all equipment, control interface, and transmit/receive dishes. Tight-beam LASER and Tachion Beam Dictor communication sets must be developed separately.

(6) Required Technician crew = (5) x 2

EXAMPLE: From step (5) Jym-bob got the number "3", so 3 x 2 is 6. In other words, there must be at least six people on board with Technic skills. (Some of them can be the same as the Astronautics people). Jym-bob goes over his group of player- characters and finds that there are only five with technic skills. Either they must get an NPC, or weekly maintenance rolls will be at -5 (normally, a roll of 01-02 is necessary for a random breakdown/malfunction). One man short, any roll of 01-07 will mean a malfunction due to lack of maintenance.

(7) Standard crew quarters = [(5) + (6)] x 20 cubic meters.

EXAMPLE: Jym-bob got 3 Astronautic crew from step (5) and 6 Technicians from step 6, so: 3 + 6 = 9. 9 x 20 is 180. Even though there might be some crew overlap, it's best to be safe.

(8) Hull volume (see armor chart, esp. minimum armor types for mass classes) = (2) x (armor volume factor / 50).

Construction Armor

Types (CAT)	Mnv/DB Penalty	Cost x	Volume Factor
21. No Armor (frame)	0	0.5	0.5
22. Light Steel	-5	1	1.0
23. Reinforced Steel	-10	1.5	2.0
24. Aligned Crystalline Steel	-15	2	4.0
25. Alloyed ACS armor	-25	3	7.0
26. Double hull	-35	4	10.0
27. Double reinforced	-40	5	12.0
28. Double heavy steel	-50	6	15.0
29. Ardinium	-10	30	1.75
30. Ordium II	-5	50	2.5

The DB penalty referred to in the Construction Armor Chart indicates the subtraction made from any Piloting skill bonus or Evade computer program due to the unwieldiness of a ship with such encumbering armor.

Minimum Armor Requirements:

- 22 — Minimum for 1-man fighter.
- 23 — Minimum for craft over 500 tons (yachts; survey; gunship)
- 24 — Minimum for craft over 10,000 tons (patrol scouts; small freighters; missile cruisers)
- 25 — Minimum for craft over 50,000 tons, and any shielding over 100 (unless special). Standard for smaller war ships (frigates) and small passenger liners and most freighters.
- 26 — Minimum for craft over 100,000 tons: patrol line cruisers, larger passenger liners or very small orbital stations.
- 27 — Minimum for craft over 300,000 tons: Flag cruisers, larger space stations.

Other, superior alloys are available. Multiplier applies to cost:

- x2 for +5 to DB or -5 from Maneuver penalty and -5% from volume
- x5 for +10 to DB or -10 from MP and -10% from volume
- x10 for +15 to DB or -15 from MP and -15% from volume
- x15 for +20 to DB or -20 from MP and -20% from volume
- x20 for +25 to DB or -25 from MP and -25% from volume

EXAMPLE: Jym-bob decides that the group isn't rich enough to afford Ardinium or Ordium II. The **Merino**, at 1000 tons, must have at least CAT 23, but Jym-bob buys +10 superior alloy at 5x cost. $1.5 \text{ (for CAT 23)} \times 5 \text{ (for +10 alloy)} = 7.5 \text{ cost multiplier}$. $7.5 \times 1000 \text{ (tonnage)} \times 50 = 375,000 \text{ Elmonits}$. (If Jym-bob opted for normal CAT 23 steel, it would only cost 75,000 Elmonits!) As far as volume, Jym-bob uses the formula: $(2) \times (\text{armor volume factor} / 50)$: $3000 \times (2.0 / 50) = 120$. Due to his snazzy alloy, however, Jym-bob gets 10% off, so the total volume is only 108 cubic meters

(9) Volume available for installations = (2) - (3) - (4) - (7) - (8) cubic meters (cumets).

EXAMPLE: Jym-bob gets the numbers from his previous steps and calculates furiously: $(3000) - (55 + 7 + 180 + 108) = 2650 \text{ cumets}$, which is the remaining volume available.

NOTE: Keep in mind when calculating the size and power of the ship drives, screens and weapons that the Energizer will increase in size proportionally with the other installations, and they all must fit within the preset ship size. If weaponry is going to be very important, you might want to do a few test calculations, or even do the weapon volumes first, then your drives. Naturally, since all combat is at sublight speeds, the sublight drive is what is important for combat.

(10) The Relative Inertial Field Generator. Actually a small device by comparison with other installations, the volume of the generator is ascertained with the formula $(1)/100$. It also requires a 'net', a superconductor grid implanted over the hull to appropriately distribute the field. The volume requirement is $(1)/200$ for the net. The cost is a base 10,000 + $[(1) \times 100]$ Elmonits for the unit; $(1) \times 10$ for the net.

EXAMPLE: Jym-bob performs the arithmetic: His mass from step (1) is 1000 (remember?). Sooo, 1000 divided by 100 is a paltry 10 cumets, and the net is a mere 5. His cost, however, is $10,000 + 100,000 = 110,000$ for the unit, plus $(1000 \times 10) = 10,000$ for the net. Jym-bob has 2635 cumets of volume left.

(11) Drives, Screens, and Weapons

A. SUBLIGHT DRIVE UNIT (Fusion): Volume = $(2)/100$ for each acceleration rating pick. 1st ten picks = 100 km/rnd per pick; 2nd ten = 50 km/round per pick; each set of ten afterwards = 1/2 value of preceding pick set value. Note that the ratio of energy expenditure to acceleration becomes excessive after a point. If using a fission drive, use $(2)/50$ for each acceleration rating pick. See Reactor/Energizer section for fuel storage calculations.

EXAMPLE: Jym-bob decides that a fusion sublight drive is the only way to go. He invests 12 picks, so his volume is $(3000)/100 \times 12 \text{ picks} = 360 \text{ cumets}$. The **Merino's** maximum sublight acceleration is 1100 kilometers per round (110 km/second). His total cost is 30,000 base + $[12 \text{ rating picks} \times (3000) \times 5] = 210,000 \text{ Elmonits}$.

B. TRANS LIGHT DRIVE UNIT: $(2)/75$ for each TLD (trans light displacement) velocity rating pick. TLD = number of light-years traversed in a 25 hour period (one TLD = 1 light-year, covered in one standard day). 1st ten picks = 1 TLD/pick; 2nd ten = .5 TLD/pick; each set of ten afterwards = 1/2 value of preceding pick set value. Once again, there is a declining return on power investment.

EXAMPLE: Not wanting the **Merino** to be a slouch in Hyperspace, Jym-bob takes ten rating picks worth of hyperspace engine power. Thus his volume is $(3000)/75 \times 10 \text{ picks} = 400 \text{ cumets}$. His ship is capable of displacing 10 light-years in one standard day. Jym-bob's total cost for Translight

drive is: $100,000 \text{ base} + [10 \times 3000 \times 10] = 400,000$. Jym-bob decides on pylon-mounted nacelles for the translight drive (he can jettison them if they threaten to overload).

C. DEFENSIVE SCREENS: These screens consist of a net of fine superconductor wire implanted in the ship's hull, and charged with energy to create the deflector screens. In addition to the net are of course the screen generators, usually located amidships. The volume requirement is (2)/200 for the deflector net (must be a separate net in addition to a RIF generator net) + (2)/100 for each Defensive Screen rating pick. Rating Pick bonuses are as described in the definitions at the beginning of the section. There is a declining return on power and equipment volume investment. Any ship travelling through Hyperspace requires at least one pick in Deflector screens (and the net) for the purpose of 'navigational deflectors'. These protect the ship from microscopic interstellar space debris. This first pick does also give the ship a +5 to its DB in combat.

EXAMPLE: Again, the thought of combat in mind, Jym-bob purchases 10 picks of deflection power, giving the **Merino** a 50 Defensive Screen Rating. His volume used is $(3000)/200 = 15$ cumets for the net, plus 10 rating picks $\times (3000)/100 = 300$ cumets. Total volume for screens is 315. The monetary cost is $(3000) \times 10 = 30,000$ Elmonits for the net, plus 10 picks $\times (3000) \times 5 = 150,000$; total screen cost = 180,000 Elmonits. At this point, Jym-bob does a quick calculation to determine how much room he has left. His volume available for installations was 2650 cumets. So far he has used 360 (sublight drive) + 400 (translight drive) + 315 (screens) = 1075. $2635 - 1075 = 1560$ left.

D. STEALTH/JAMMING/EW EQUIPMENT: Volume = (2)/200 for net (not necessary if ship has deflector shields); the EW and Deflectors can use the same grid; (The RIF generator requires its own, however) + (2)/100 for each Stealth Pick; Rating Pick bonuses are as described in the definitions at the beginning of the section. When activated, bonus is given to ship as a subtraction from sensor or visual rolls by other ships — at half value if used as a general 'cloak'. Can also act as a subtraction from attacking ship's OB, if detected. In addition, can be used to cancel target ship's EW-DB, or jam (destroy) incoming missiles. See Stealth/Jamming rules in Spacecraft Combat, sec 6.13 for more details.

EXAMPLE: Stealth equipment sounds too good to pass up to Jym-bob, so he takes ten rating picks in that, too. Since he already has deflector screens, he doesn't have to worry about installing a net. Volume consumed: $(3000)/100 \times 10$ picks = 300 cumets. Cost is 10 rating picks $\times (3000) \times 10 = 300,000$ Elmonits. (Stealth systems are expensive!) 1260 cumets of volume left.

E. ARMAMENT: Weapons power and range is determined by the Mk. #. The failure ranges given refer only to armaments installed on spacecraft when utilized in spacecraft combat. When these weapons are utilized in any other mount (ground installations, AFV's, etc.), use the failure ranges supplied with the combat tables.

Heavy Energy Projectors:

Laser Cannon: Volume = (Mk. #) $\times 3$ for gun mechanism and fire control. Fails on 1-7

Blaster: Volume = (Mk. #) $\times 4$ for gun mechanism and fire control. Fails on 1-3

Ion Cannon: Volume = (Mk. #) $\times 5$ for gun mechanism and fire control. Fails on 1-5

Disruptor: Volume = (Mk. #) $\times 5$ for gun mechanism and fire control. Fails on 1-2

Plasma Gun: Volume = (Mk. #) $\times 10$ for gun mechanism and fire control. Fails on 1-8

Missiles/Torpedoes:

Matter/Antimatter Torpedoes: Volume = Mk. # $\times 5$ for launcher and fire control, + (.1 \times Mk. # \times number of torpedoes stored). Available only with M/A reactor on board. Fails on 1-4

Nuclear Missiles: Volume = Mk. # $\times 6$ for launcher and fire control, + (.5 \times Mk. # \times number of missiles stored). Fails on 1-4

Explosive Missiles: Volume = Mk. # $\times 7$ for launcher and fire control, + (1 \times Mk. # \times number of missile stored). Fails on 1-4

Non-explosive Projectiles: Volume = Mk. # $\times 5$ for launcher and fire control, + (.1 \times Mk. # \times number of torpedoes stored). Fails on 1-4

EXAMPLE: No longer worried about budget problems, Jym-bob decides to mount two Mk. 10 laser cannons on the **Merino** and two Mk. 20 Matter/Antimatter torpedo launchers. For the laser cannons, his volume is Mk. $10 \times 3 \times 2$ guns = 60 cumets. His cost is Mk. $[10,000 \text{ base} + (10 \times 5000)] \times 2$ guns = 110,000 Elmonits. The torpedo launchers' volume is Mk. $20 \times 5 \times 2$ launchers = 200 cumets. He gets five torps (and a 5-torp loading magazine) for each launcher, and their volume is .1 \times Mk. 20×10 torpedoes total = 20 (Jym-bob has 980 cumets of volume left.) The torpedo launcher cost is $[30,000 + (500 \times \text{Mk. } 20)] \times 2$ launchers = 80,000 Elmonits. His initial torpedo expenditure is Mk. $20 \times 50 \times 10$ torps = 10,000 Elmonits.

HUD's: HUD's (Heads Up Displays) are necessary if Heavy Energy Projectors are to be manned by individual gunners. These are targeting and computer interface aids displaying target information, sensor plotting, etc. Their presence has no effect on volume calculations, but their expense must be kept in mind. The base cost for each HUD (one needed per manned gun) is 5,000 Elmonits. Superior HUD's which give an additional gunner bonus can be purchased: 10,000 for each +5 HUD; 20,000 for each +10 HUD; 30,000 Elmonits for each +15, and 50,000 for each +20 bonus HUD.

(12) Reactor/Energizer: Look at A and B above (Sublight and Translight Drives). Since you will never be operating both at the same time, the energizer need only be powerful enough to run one — the larger one, obviously, so select the one in which the most rating picks were made. Add up all picks for installations (A or B) + C + D above. $3 \times [(2)/1000]$ equals the ER volume for each box for these installations, so multiply the total number of picks \times the ER per-pick rating to get the rating of an energizer large enough to run all three units simultaneously at full power.

EXAMPLE: Poor Jym-bob; the math is getting to him. (He almost flunked Algebra last semester, too.) Anyway, he adds up his rating picks: 12 (sublight) + 10 (screens) + 10 (stealth) = 32. $3 \times [(3000)/1000] \times 32 = 288$.

Add up the total Mk. rating of all Energy weapons on board (remembering to double the Mk. for Plasma Gun — if the ship is to be equipped with one — to accommodate the power drain). Do not add in Projectile weapons, as their destructive power is more or less self-contained.

This number means that you could theoretically fire every energy weapon on the ship once per turn. There are a total of six rounds per turn, however, and the opportunity exists to fire the weapons every round — if the power is available. Of course, the power can be re-routed. For instance, a ship with six Mk. 10 laser cannons could just as easily fire one cannon six times in one turn as fire each cannon once per round or all six cannons simultaneously in one round. Power points cannot be saved from turn to turn. In an emergency situation, points could even be routed from the shields to a weapon. The decision to route power from one system to another must be made at the beginning of the turn, however.

EXAMPLE: Jym-bob has selected two Mk. 10 Laser cannons for the **Merino**, and wants to be able to fire every cannon every round (just in case). So, he takes the total Mk. ratings of both guns ($2 \times 10 = 20$), and multiplies it times 6, reflecting the six rounds within the turn. The weapons energy rating is therefore 120 (Jym-bob's two M/A torpedo tubes are not counted, since they are 'missile weapons', as noted above.)

Finally, a number is needed to reflect the ongoing needs of the ship's other systems, such as life support, the computer, etc. This is achieved with $(2)/100$.

The total of The Installation ER + (weapons Mk. total) + $(2)/100$ = the Total Energy consumption Rating (TER) necessary to run all the installations and weapons at full power simultaneously. The Power Plant will have to have this rating in order to operate those installations. Alternatively, the Plant can have a lower rating, and only operate certain systems simultaneously. In addition, one can play with factors such as the Stealth/EW and weapons systems, though it may mean that the Stealth field would have to be dropped in order to fire energy weapons. It is recommended that you play with the numbers, figuring each system's power requirements per turn, then adding up the total power requirements.

Matter/Antimatter reactor volume = $.5 \times \text{TER}$.

Fusion Reactor volume = $1.0 \times \text{TER}$.

Fission Reactor volume = $2.0 \times \text{TER}$.

EXAMPLE: Jym-bob adds 288 (installation ER) + 120 (weapons ER) + 30 (Ship systems ER) and gets 438. He selects the state-of-the-art Matter/Antimatter Energizer (also needing it to arm his M/A torpedoes) and determines that the volume for the unit is $.5 \times 438 = 219$ cumets. Jym-bob's cost for the reactor is the base of 50,000 + $(438 \times 1000) = 488,000$ Elmonits.

(13) Fuel Storage: Fuel is needed both to power the drives and the reactors. Naturally it makes sense to combine the fuel supplies of units using the same fuel. So, total common fuel requirements for drives and reactor and determine the total added % for containment equipment.

Sublight Drive:

Fusion Fuel volume: $.005 \text{ cumet} \times (\text{Drive ER}) =$ one hour of operation. Add an additional 10% to this volume for containment equipment. If Ramscoop incorporated, standard 1 cumet tank is kept filled by scoop (as long as the ship is moving through N- space).

Fission Fuel Volume: $.01 \times (\text{Drive ER}) =$ 1 hour of operation. Add 25% extra for shielding and containment equipment.

Tranlight Drive (M/A):

Fuel: $.001 \text{ cumet} \times (\text{Drive ER}) =$ 1 light year displacement. Add an additional 50% to this volume for containment equipment.

Reactor/Energizer:

Matter/Antimatter Reactor Fuel volume: $.001 \text{ cumet} \times (\text{TER}) =$ 100 days operative power. Add an additional 50% to this volume for containment equipment.

Fusion Reactor Fuel volume: $.05 \text{ cumet} \times \text{TER} =$ 100 days operation. 10% of this volume is containment equipment. (If a Ramscoop is incorporated, remember that there must be fuel to operate while in hyperspace, as the Ramscoop is inoperative.)

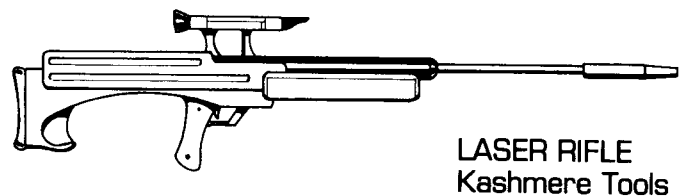
Fission Reactor Fuel volume: $.01 \text{ cumet} \times \text{TER} =$ 100 days operation. 25% of this volume is shielding and containment equipment.

NOTE: During combat, each hour (or fraction of an hour) engaged consumes the equivalent of a day's normal operating fuel. Also, note the containment percentages; these are also applicable if the ship is carrying supplemental fuel for shuttles and small fighters on board.

EXAMPLE: To power his M/A drives, Jym-bob decides on a 10 cumet fuel container, enough to propel the **Merino** 1000 light-years: $.001 \times (\text{Drive ER, in this case } 10) \times (10 \text{ cumet tank}) = 1000 \text{ light-years}$. He also allows for Matter-antimatter Reactor/Energizer fuel storage to last 500 days: $.001 \times 438 \times 5$ (for 500 days) = 2.19 cumets. Total M/A storage requirement (rounding off): 12. For the M/A fuel enclosure he needs an extra 50%, or 6 cumets, bringing total volume to 18. His storage facility is the base of $1000 + (18 \times 1000) = 19,000$ Elmonits. He incorporates a ramscoop to power his fusion drive, so he needs only the 1 cumet tank, and pays 30,000 Elmonits for the scoop package.

(14) Auxiliary Reactor: (Powers only ship onboard systems; no power for weapons, drives or shields, since it is not designed for such, sacrificing power in return for compactness). It is recommended that this reactor be of the same type as the main reactor so that it can use the same fuel. This auxiliary reactor consumes fuel at a quarter the normal rate of the main reactor. The ER used to determine size is $2 \times$ the systems ER (it is more than just the systems ER because of set requirements for such a reactor, even if very small).

EXAMPLE: Jym-bob determines that his auxiliary reactor will take up 30 cumets: $2 \times 30 \times .5 = 30$. The cost is the base 10,000 + $(2 \times 30 \times 0,000) = 70,000$ Elmonits. Jym-bob does another calculation to figure out how much volume he has left: $980 - 219$ (main energizer) - 18 for M/A fuel - 30 (aux. energizer) = 713.



LASER RIFLE
Kashmere Tools

ADDITIONAL FACILITIES:

Attitude Thrusters: These are mainly used for docking maneuvers and other delicate orientation changes. They are not very powerful and are too slow to be useful in a combat situation. Spaced over the ship's hull, they use compressed carbon dioxide. The volume calculation is: $(2)/200$.

EXAMPLE: $(3000)/200 = 15 \text{ cumets}$. Cost is $3000 \times 5 = 15,000$ Elmonits.

Gravitic Control: This is an energy field which creates artificial gravity throughout a ship. It also (in ships designed to land) is used to negate the ship's weight, making atmospheric maneuvering easier. The dual-use field requires a volume of $(2)/100$ cubic meters; only half that is needed if the ship does not land or perform suborbital operations.

EXAMPLE: Jym-bob wants the **Merino** to be able to land, so gets the full-use gravitic field. $(3000)/100 = 30 \text{ cumets}$. The cost is $3000 \times 10 = 30,000$.

Landing Gear: Standard struts, etc. Needed, of course, only if the ship is designed to land. Volume = $(2)/100$.

EXAMPLE: $(3000)/100 = 30 \text{ cumets}$. Cost for landing gear is $3000 \times 5 = 15,000$ Elmonits.

NOTE: Gravitic Landing Fields and Landing Gear not applicable for ships over (or around) 100,000 tons, as the hull bracing for such capability would be prohibitively massive and expensive. Internal gravitic fields are strongly suggested, however, to maintain a constant internal mass distribution.

OPTIONAL FACILITIES:

Tractor Beam: Actually a concentrated and very powerful gravitic beam (enough to overcome most ships' normal internal gravitic control). Tractor beams have Mk. numbers, indicating how many thousands of tons they can hold (a 10 Mk. Tractor can hold 10,000 tons under normal circumstances). Tractors are too cumbersome and imprecise to be effective in a combat situation — unless the opponent is surprised. Even so, a ship gripped by a tractor beam can try to break away on sublight drives. Every 1 LS/minute of thrust potential increases the ship's effective mass against the beam by an additional times 1. For example, Jym-bob's 1000 ton ship requires only an Mk 1. tractor to hold it stationary, assuming it was not trying to get away. If the ship activated sublight thrust of 5 LS/min acceleration, it would have an effective mass against the beam of 5,000 tons and require an Mk. 5 tractor to hold it; more to bring it closer. The volume for a tractor beam is $Mk \# \times 10$ cubic meters. It also requires a lot of energy: 3x the Mk. number, but since it is rarely used in combat, the power should be readily available. Range = 100 km/Mk. #

Passenger Staterooms:

High Quality: 40 cumet each. Holds 1-2 beings.

Mid-range: 30 cumet each. Holds 2 beings.

Bargain/military: 30 cumet each. Holds 4 beings.

Cryogenic Berth: 3 cumet each. Holds 1 being.

Workshop: Repairs receive a bonus of +1 for every 10 cumets of workshop volume (up to +50). In addition, the workshop is necessary to make any in-space repairs requiring cost in parts. The minimum size is 30 cumets. See section 6.4 for details of repair costs, difficulty, and workshop bonus. In addition, to perform any repairs requiring 'cost in parts', the workshop must be stocked with materials. This is done abstractly, by simply spending the money. The amount of spare parts value stored cannot exceed the shop volume x 2000.

EXAMPLE: Jym-bob elects to equip the ship with a workshop 100 cumets in volume, adding +10 to his crew repair rolls. The cost is $100 \times 500 = 50,000$ Elmonits. This is just the basic cost of the shop. Jym-bob's maximum parts storage 'value' is 100,000. He decides to use all of it, so his crew can now perform repairs costing up to 100,000 Elmonits.

Medical facilities:

Dispensary: 1 cumet/crewmember (10 cumet min). Required for first aid.

Sick bay: 25 cumets/patient. Required for operations.

EXAMPLE: Jym-bob includes a 10 cumet dispensary and 50 cumet Sick bay. Cost is $10 \times 200 = 2000$ for the dispensary and $50 \times 500 = 25,000$ for sick bay.

Recreation facilities: 5 cumets per stateroom passenger/crew capacity. (50 minimum)

Auxiliary Life Support: (main life support integrated in crew quarters) 3 cumets/being on-board.

Auxiliary Bridge: All ship astrogration and maneuvers performed here are two difficulty levels higher because of compact, less sophisticated controls. Volume equals $.75 \times [\text{square root of } (2)]$.

EXAMPLE: Punting Recreation, Jym-bob includes auxiliary life support: $9 (\text{crew members}) \times 3 = 27$ cumets; cost: 54,000. He also installs an auxiliary bridge. The volume is 55 (main bridge size) $\times .75 \approx 42$. Cost is $42 \times 1000 = 42,000$ Elmonits. The latest volume count is: 713 - 15 (thrusters) - 30 (gravitics) - 30 (landing gear) - 100 (workshop) - 60 (medical facilities) - 27 (aux. life support) - 42 (aux. bridge) = 409.

Cargo Bay: as desired.

Shuttle Bay: (2x shuttle volume minimum required)

EXAMPLE: Wanting one very small landing shuttle (volume: 100 cumets) Jym-bob devotes the necessary 200 cumets to it. His cost is 2000 Elmonits. Jym-bob has 209 cumets left.

Fighter Bay: (5x fighter volume minimum required — for maintenance, fueling and repair access).

Security Stations: 5 cumets/10 marines on board. Used for weapon storage and control. This could be much larger if it includes space armor.

Laboratories: Each 5 cumets adds +1 to related research (up to +50). 30 cumets minimum. Note that each lab must be devoted to a specific type of scientific skill. Related skills receive half-bonus.

EXAMPLE: The **Merino** has 209 cumets left after the shuttle bay. He decides to devote 200 to labs (costing 200,000 Elmonits but granting a +40 to related research) and the leftover 9 to cargo. Note that he could go back and perhaps increase his drive size or add weaponry. However, this would affect the overall TER, which would have to be recalculated. As it is, however, Jym-bob has completed the **Merino** at a cost of 3,172,000 Elmonits. The actual design is very flexible. See section 3.32, Ship Type I for one possible design incarnation of the **Flying Merino**.



4.212 STARSHIP PARTS COST

To be used in concert with the starship design chart. In general, a number in parentheses corresponds to a number on the Design chart. Example: (2) indicates the ship volume in tons.

Equipment	Cost (Monits)
Bridge Control Systems (vol inc w/cmptr)	(3) x 1000
Consoles	5,000 each (1/Astro crew min)
Computer	Mk # x 1,000 + 10,000 base cost
Computer Programs	See Computer cost chart: 3.22
Sensors	2,000 + 500/LY
Communications	1,000 + 200/range unit
Crew Quarters; related facilities	(7) x 10
Hull/Frame	(1) x Costfac x 50
Relative Inertial Field Generator	10,000 + [(1) x 100] Base cost for net (1) x 10
Sublight Drive: Fusion	30,000 base + [# picks x (2) x 5]
Fission	20,000 base + [# picks x (2) x 4]
Translight Drive	100,000 base + [# picks x (2) x 10]
Defensive Screens: Base cost for net	(2) x 5
Additional	# picks x (2) x 10
Stealth System: Base (N/A if ship has deflectors)	(2) x 10
Additional	# picks x (2) x 10
Armament:	
Energy Guns:	
Laser Cannon	10,000 base + [Mk. # x 5000]
Ion Cannon	8,000 base + [Mk. # x 4500]
Blaster	8,000 base + [Mk. # x 4000]
Disruptor	7,000 base + [Mk. # x 3500]
Plasma Gun	16,000 base + [Mk. # x 8000]
Missiles:	
Matter/Antimatter Torpedo Launcher	30,000 + 500 per Mk. #
Torpedoes (each)	Mk. # x 50
Missile Launcher	20,000 + 400 per Mk. #
Missiles (each):	
Thermonuclear	Mk. # x 20
Explosive	Mk. # x 5
Projectile	Mk. # x 5

Equipment	Cost (Monits)
Head Up Displays	5,000 base (see txt)
Power Plant:	
Matter/Antimatter reactor	50,000 + TER x 1000
Fusion Reactor	35,000 + TER x 850
Fission Reactor	20,000 + TER x 750
Auxiliary Reactor	10,000 + 2 x sys ER x rate as above
Fuel Storage:	
Matter/Antimatter	500 per cumet
Fusion	100 per cumet
Ramscoop	(2) x 10 (inc. tank cost)
Fission	400 per cumet
Fuel Cost:	
Antimatter	1000 per .1 cumet (varies)
Liquid Hydrogen	100 per .1 cumet (varies)
Fissionable material	600 per .1 cumet (varies)
Additional Facilities:	
Attitude Thrusters	(2) x 5
Gravitic Control (½ if not landing)	(2) x 10
Landing Gear	(2) x 05
Optional Facilities:	
Tractor Beam	10,000 base + [MK # x 5,000]
Passenger Staterooms	Sttrm vol x 15
Workshop and equipment Cost in Parts supplies	wkshp vol x 500 (as desired, up to 2x shop cost)
Medical Facilities:	
Dispensary	vol x 200
Sick Bay	vol x 500
Recreation facilities	vol x 20
Auxiliary Life Support	vol x 200
Auxiliary bridge	Aux brdg vol x 1000
Cargo bay	vol x 5
Shuttle bay	vol x 10
Fighter bay	vol x 50
Security station	vol x 20
Lab	vol x 1000

4.213 STARSHIP DESIGN WORKSHEET

To create Starships with sec. 4.21 use the worksheet to mark off system picks (sec 4.6).

SYSTEM VOLUME (cumets)

- (1) Select ship displacement in tons. _____
- (2) Volume = (1) x 3 cubic meters. _____
- (3) Bridge (Control area) _____
- (4) Computer _____
- (5) Astronautic crew _____
- (6) Technician crew _____
Total crew _____
- (7) Crew quarters _____
- (8) Hull volume _____
- (9) Volume available for installations _____
- (10) Relative Inertial Field Generator: (1)/100 _____
- (11) Drives, Screens and Weapons _____

A. SUB LIGHT DRIVE UNIT (Fusion): (2)/100 for each acceleration rating pick. If using a ramscoop, add a flat (2)/50. (Fission drive: (2)/50 for each acceleration rating pick.)
Actual cost per pick: _____

Total Volume _____

Max. Sublight Accel. _____

B. TRANS LIGHT DRIVE UNIT: (2)/75 for each TLD (trans light displacement) velocity rating pick. TLD = number of light-years traversed in a 25 hour period (one TLD = 1 light-year, covered in one standard day).

Actual cost per pick: _____

Total Volume: _____

Hyperspace velocity: _____

C. DEFENSIVE SCREENS: (2)/200 for deflector net + (2)/100 for each Defensive Screen pick.

Actual cost per pick: _____

Total Volume: _____

Defensive Bonus: _____

D. STEALTH/JAMMING EQUIPMENT: (2)/200 for net (not necessary if ship has deflector shields) + (2)/100 for each Stealth Pick.

Actual cost per pick: _____

Total Volume: _____

EW Total Rating: _____

E. ARMAMENT: Weapons power and range is determined by the Mk. = . Volume:

Laser Cannon: (Mk. #) x 3 each gun _____

Blaster: (Mk. #) x 4 each gun _____

Ion Cannon: (Mk. #) x 5 each gun _____

Disruptor: (Mk. #) x 5 each gun _____

Plasma Gun: (Mk. #) x 10 each gun _____

Matter/Antimatter Torpedoes: Mk # x 5 each launcher
(Available only with M/A reactor on board.) _____

Plus .1x # of torps x Mk + _____

Nuclear Missile: Mk = x 6 each launcher _____

Plus .5 x # of missiles x Mk + _____

Explosive Missile: Mk # x 7 each launcher _____

Plus 1 x # of missiles x Mk # _____

(12) Reactor/Energizer

Matter/Antimatter reactor: .5 x TER + volume _____

Fusion Reactor: .75 x TER + volume _____

Fission Reactor: 1.5 x TER + volume _____

(13) Fuel Storage

Drives:

Fusion Sublight:
.005 cumet x (Drive ER) = 1 hr operation _____

Fission Sublight
.01 cumet x (Drive ER) = 1 hr operation _____

M/A Translight:
.001 cumet x (Drive ER) = 1 LY displacement _____

Reactor/Energizer

M/A: .001 cumet x (TER) =
100 days pwr (add 50% for cntnr) _____

Fusion: .05 cumet x TER =
100 days pwr (add 10% for cntnr) _____

Fission: .01 cumet x TER =
100 days pwr (add 25% for cntnr) _____

SYSTEM VOLUME (cumets)

(14) Additional Facilities

Auxiliary Reactor:

2 x Systems ER x reactor type factor (see 12)

Attitude Thrusters (2)/200

Gravitic Control: (2)/100 (½ if ship does not land)

Landing Gear: (2)/100

Tractor Beam:

Passenger Staterooms:

High Quality: 40 cumet each. 1-2 beings.

Mid-range: 30 cumet each. 2 beings.

Bargain fare: 30 cumet each. 4 beings.

Cryogenic Berth: 3 cumet each. 1 being.

Workshop:

Dispensary:

Sick bay:

Recreational Facilities

Auxiliary Life Support

Auxiliary Bridge

Cargo Bay

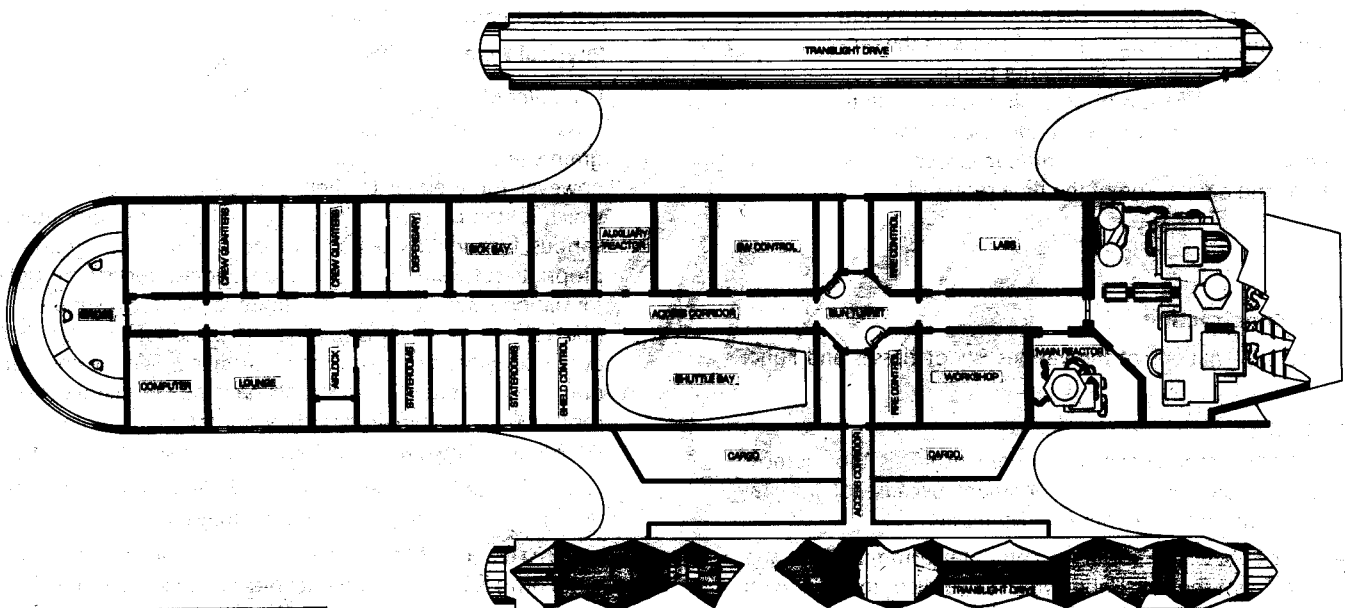
Shuttle Bay

Fighter Bay

Security Stations

Laboratories

Total Volume:



Meters
0 1 2 5 10

4.22 VEHICLE AND ROBOT CONSTRUCTION

This section embraces Robots (as opposed to Androids) GCV's, SMAC (Singly Manned Attack Conveyance) Fighters, and any other land, sea or air machines. At the end of the section are located the "Construction Tables" for these machines: one for the standard classes of Robot, and one covering construction of all other craft (besides Starships). The concept behind these tables is identical to that used to create characters in **Character Law**, except that the ability to pick (or 'purchase' in this case) the machine characteristics — and the level of those characteristics — is based upon monetary cost rather than stat points. These are called *Function Rating (FR) Points*. A few general facts applicable to Robot and Vehicle Construction:

FR Picks: (Function Rating Picks): These are acquired with Function Rating Points. Most Picks cost more than one Point each. Sometimes referred to as Function Rating "levels".

FR Points: (Function rating Points): Purchased at a given monetary value, these points may be expended to buy Function Rating Picks (above) and thus provide different functions for a given vehicle/robot.

Function: The mechanical equivalent of a character development "Skill".

- Unless otherwise noted, one Function Rating Point for these machines equals 1000 Elmonits (keep in mind that a "Rating Pick" can cost more than one "Rating Point". Also, each class of Robot has a final 'cost multiplier' (see the Class descriptions) based on the overall Robot design.
- The maximum FR points available for any given project are equal to the averaged applicable skill bonuses of the Construction team plus the Computer Design Bonus. This second bonus is based upon the Mk. of whatever computer is used in tandem with the construction team. Any Robot or Vehicle construction attempted without computer aid is considered to be at -50 because of the additional time needed for design.
- Before construction can begin, appropriate design research (using the applicable Science bonuses) must be done. The acquired information is fed into the computer being used with the project, thus affecting the computer bonus.
- As is true for just about everything in this section, the Research/Construction table is used for final Robot and Ship construction success confirmation, and a reflection of the time required.

4.221 Robot Construction

Below are explanations of the various Robot classes and Functions.

ROBOT CLASSES

Service Bot: A worker specializing in maintenance. This Robot is most efficient at manipulating heavy equipment because of integral servo-mechanisms in the design. Cost Multiplier: .7.

Mech Interface Bot: A "self-portable" computer/communicator and manipulator. This is the only Robot which can directly interface with mounted weapons' HUD/gunner installation (assuming such an installation is equipped with a Robot interface terminal). When interfaced, the Robot adds its appropriate Equipment Interface Function Rating bonus to the gun firing bonus (see *Mech Interface* below). Cost Multiplier: 1.5.

Human Relations Bot: Used in societies where Androids and Replicants are outlawed, these are the most "Hominoid" of the robots. They are usually employed to perform light menial labor, serving as valets or other household servants. They are also usually skilled communicators, and probably the most versatile overall. Cost Multiplier: 1.0.

Combat Bot: Used almost exclusively in all-out military situations on hostile worlds, these are highly mobile, self-controlled intelligent fighting machines. Cost Multiplier: 3.0.

MASS DETERMINATION

To determine mass of a Robot, use the formula below:

Robot relations and Mech Interface Bot: # of Function Rating Picks x 1 kg = mass.

Service Bot: # of Function Rating Picks x 2 kg = mass.

Combat Bot: # of Function Rating Picks x 3 kg = mass.

In addition, any Robot which uses a Construction AT multiplies its mass x 1.5 (unless special alloy or AT 29 or 30).

Size is a subjective determination made by the designers and the GM, keeping in mind that more Function Points generally means more size.

FUNCTION DESCRIPTIONS

Remember, when allocating Function Rating Picks, that for many Functions (Maneuvering, Screens, Radiation Shielding, EW, Equipment interface, Weapon Function Ratings, all General and Special Functions) the first ten Picks are valued at 5 points each, the second ten 2 points each, the third ten 1 point, and all afterwards 1/2 point, just like Character skill picks.

Physical Parameters:

Computer Mk. #:

As usual, the Mk. # gives the Processing (CPU) capacity in program size units. Robot computers have a limited storage capacity, however (only equal to their CPU capacity, rather than double, which is standard for Starship Computers). The computer add for various functions is dependant on the FR — assuming the appropriate software. In addition to standard permanent storage information assumed to be programmed into the computer memory (the volume of which is not included; the full storage capacity is available) other programs can be installed. See the computer program chart, section 3.22. Robots have no language capability except for BIVOC, a binary-based robotic language, unless it is installed independently, and the Robot has at least one pick of Oration.

Power: The GM may want to restrict the maximum Function Rating level for power source, to reflect an inferior technology.

NOTE: The per-pick cost for Power (as well as Motive Form) is based on the total picks to be used for the Robot (not including the Power Picks themselves, of course) to reflect the mass to be powered and moved. The total picks to be used must be decided on before these Functions are picked, and the cost (in points) per Power Function Rating Pick # (Total Picks/50).

FR Level	Notes
0	Virtually inoperative.
1	Batteries, 10 hour charge.
2	Batteries, 20 hour charge.
3	Batteries, 30 hour charge.
4	Batteries, 40 hour charge.
5	Capacitors, 50 hours minus integral weapon use (also minimum for heavy weapon use).
6	Capacitors, 75 hours minus weapon use.
7	Capacitors, 100 hours minus weapon use.
8	Capacitors, 125 hours minus weapon use.
9	Capacitors, 150 hours minus weapon use.
10	Internal Fusion Reactor. Runs for 20 days without refueling (half that for a Combat Bot).
— Each level pick over 10 up to 19 extends reactor life between refuelings by 20 days (10 for Combat Bots).	

These times assume full operational status; time can be conserved by reducing energy expenditure, the exact amount to be determined by the GM.

NOTE: An integral energy weapon failure resulting in a "power depleted" condition indicates a capacitance drain and that weapon is inoperative for 1-5 rounds.

Motive Form: It is possible for a Robot to have two motive forms, but they must be developed separately. The cost (in points) doubles for each additional motive function type. *Walk* and *Run* assume a Robot with leg-like limbs; *Hydrofoil* assumes aquatic capacity, and has a fixed speed range: 40-80 kph; *GEM* assumes standard max 1 meter altitude; *Jets* are maneuvering turbofans, 3m maximum vertical lift; *Gravitics* are low-concentration, maximum 10m vertical lift.

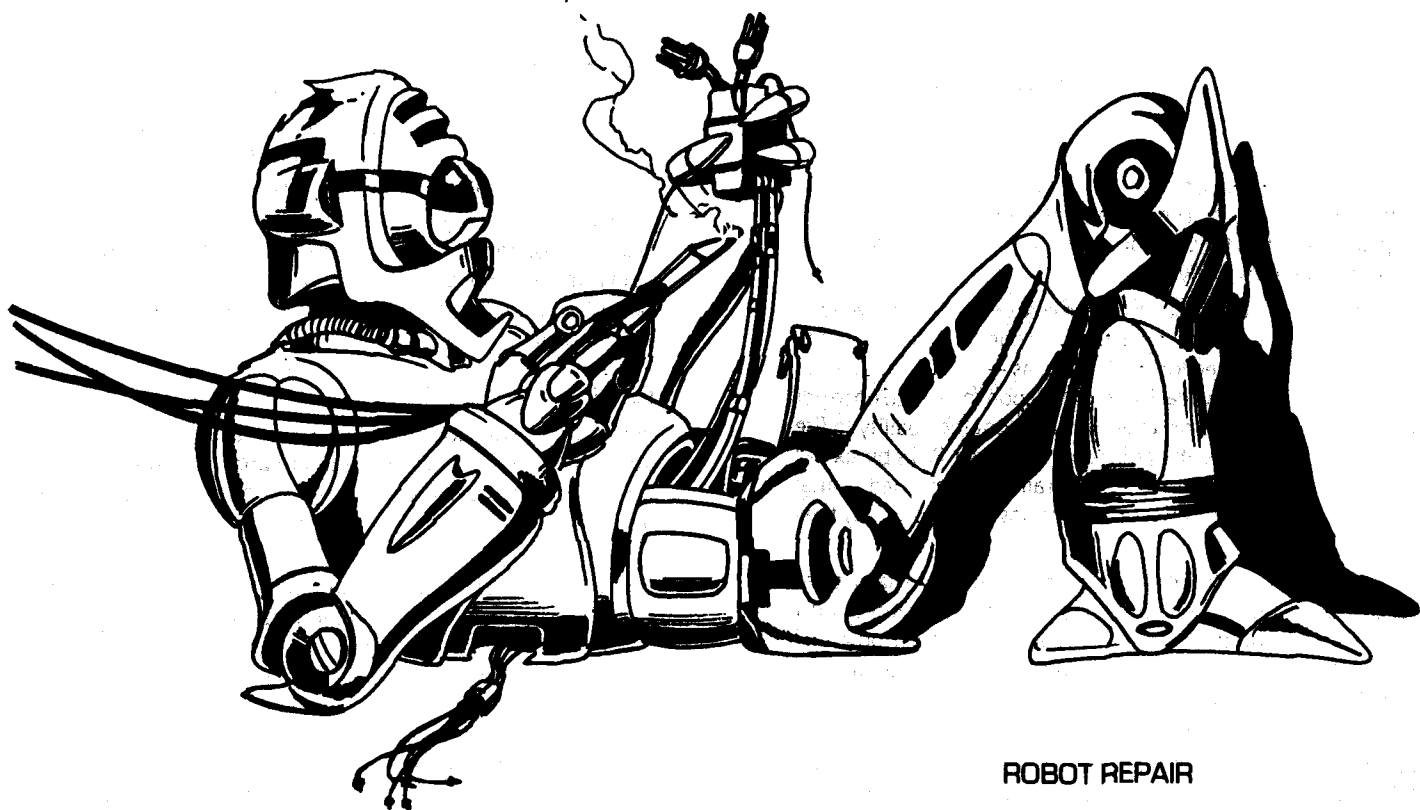
NOTE: The per-pick cost for Motive Form is based on the total picks to be used for the Robot (not including Motive Form picks themselves, of course — or Power picks), to reflect the mass to be powered and moved. The total picks to be used must be decided on before these Functions are chosen, and the cost per Function Pick (in points) = (Total Picks/50).

FR Level	Notes
0	Immobile.
1	Slow (10m/rnd) wheeled/water propeller.
2	Medium (20m/rnd) wheeled or Slow tracked.
3	Fast (30m/rnd) wheeled or Medium tracked.
4	Walk (20m/rnd).
5	Run (40m/rnd).
6	Fast tracked or Very fast (40m/rnd) wheeled.
7	Hydrofoil (base 40kph; each extra pick adds 5kph).
8	GEM (Ground Effect Maneuvering) Slow.
9	Slow Jets or GEM Medium.
10	Slow Gravitics or Medium Jets.

— Each level above 10 adds 5 to the speed rating. This may also be affected by streamlining, etc.

Maneuvering: This regular bonus is added to maneuvers performed by the Robot.

Armor (Personal AT): All Robots start at AT 13, and each FR level purchased increases the AT by 1 up to a maximum AT of 20. A Robot with a Personal AT may not have a Construction AT (see below).



ROBOT REPAIR

Armor (Construction AT): Each FR level purchased gives the Robot one (1) Construction AT level (i.e., 5 levels purchased # AT 25 — remembering that Construction AT's are numbered 21-30) up to AT 28. The special CAT 29 requires 12 Rating levels, while CAT 30 requires 16. A Robot with a Construction AT may not have a Personal AT. Note: superior alloys are available at a cost multiplier (though requiring no extra Function Rating picks) which give the Robot an additional DB. See the hulls list in the Starship Design rules for cost multiplier and DB information for superior alloys.

Concussion Hits: Each Function Rating Pick allows the Robot to take 10 concussion hits before shutting down. If a Robot takes double its total concussion hits, it is Extremely Severely Damaged.

Screens: The FR bonus reflects the DB for this defensive shielding. Most Robots use Barrier Shields (like Starships) rather than personal shields, because the former are more evenly effective against all forms of attack (in this case, completely equal), more dependable, and the additional power drain is not significant (for a robot). However, if one of the other shields is desirable instead (it is not possible to use two types of shielding simultaneously) five FR picks will buy any one of the other shield types. (see the personal shield details, sec 3.11, for the exact DB for personal shield types).

Radiation Shielding: The FR bonus is an add to the Robot Resistance Roll vs exposure to radiation which could damage the Robot brain/computer. This shielding also protects the Robot from radiant heat.

Data Output: Could be either a viewscreen to display data, a printer mechanism, holographic projector, or a datadisk recorder. More than one is possible, but they must be developed separately.

FR Level	Notes
0	Nothing
1	6cm diagonal screen
2	10cm diagonal screen
3-4	Standard datadisk recorder
5	Standard 3m range holographic projector
6	16cm diagonal screen
7	Standard sheet size printer
8	20cm diagonal screen
9	15m range holographic projector
10	30cm diagonal screen

Audio-Visual Pickup/Recorder: A built in holographic camera and projector with audio pickup. Three meter effective resolution/pickup for FR pick. Either this function or Sensors is Necessary for a mobile Robot to operate effectively.

Weapon Installation: Each pick equals the cost per 1 Mk. # of weapon installation. Add the cost of the actual weapon — if mounted, see the personal weapons, section 3.12 for costs — to the Robot total. The standard design allows each energy weapon to be fired once per round. If the designer desires to allow the Robot the ability to fire weapons 2x/rnd, increase the point cost for Power Picks by six per weapon (six Rounds in a Turn). Robot brains are designed so that they can fire every built-in weapon they possess as often as they have power to do so.

Sensors: Required for a Robot firing on more than one target per round. Each pick equals 3 meters of effective range (all targets must be within effective range). Five picks required for each potential target more than one per round — assuming available weaponry. In addition, sensors are capable of basic Multiscanner analysis (see sec. 3.11, Item Descriptions, for Multiscanner abilities).

EW/Stealth: The Function bonus is equal to the EW/Stealth field that the Robot can generate. Jamming range equals the number of Function Rating picks x 100 meters. See the EW/Stealth rules, in Starship Design, sec 4.211.

Equipment Interface: This is the cost for an interface to allow the Robot to interface with a standard piece of equipment, handheld or mounted (multiscanner, ship's sensors or computer, a communications network, etc.). The number of picks reflects the Robot bonus for that piece of equipment (standard 5-2-1-1/2 bonus progression); at least one pick is necessary for any chance of successful interface. A separate function must be developed for each general type of interface. Mech Interface Robots can link-up directly to a properly equipped mounted weapon HUD/Gunner console, using their Interface bonus. One great advantage for the Robot over a Sentient gunner: its interface Rating Function bonus is applicable for all energy or all projectile weapons, rather than a specific weapon.

EXAMPLE: A Mech interface Robot has 10 Function Rating Picks in Mounted Energy weapons. It can plug into an interface terminal of any mounted energy weapon (Laser Cannon, Disruptor Bank, etc.) and have a +50 bonus with that weapon. The gunner console must have a Robot interface terminal, however.

Weapon Function Ratings: As can be seen from the Robot Construction chart (4.223) each Robot type is restricted to a limited number of weapon types. The Rating bonus reflects the "skill" Offensive Bonus for the Robot's use of the weapon.

General Functions:

Climbing: As the Character Skill bonus, adding a bonus to climbing rolls.

Xeno-Environments: This Function Rating bonus adds to any PR's vs hostile environments: extremely high atmospheric pressure, corrosive atmosphere, excessive heat, etc. Note that a vacuum is not normally considered 'hostile' to a Robot. Some systems (GEM motive power, for instance) might not function, however, so common sense should be used in construction.

Stalk and Hide: Provides a bonus for stalking a target and being successfully concealed.

Perception: A bonus for detecting things which the robot is seeking.

Special Functions:

Ambush: Each pick allows the Robot to actually shift the number of any critical strike roll up or down by one percentage point. An Robot may ambush if they have point-blank weapon range, the target is not in a combat situation, and the target is totally surprised by the attack.

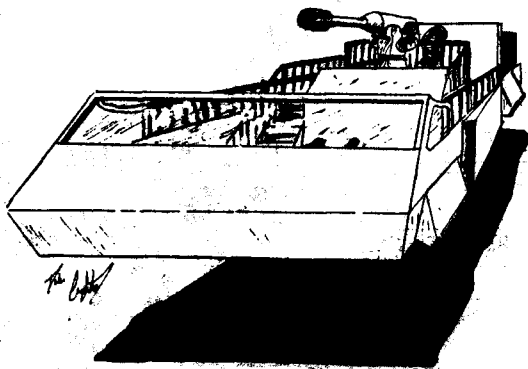
Oration: The Robot's ability to speak and be understood by Sentients. This is a bonus for using programmed languages; at least one box of Oration is necessary for the Robot to be able to speak anything other than BIVOC (languages are usually implanted as 'hard' software and consume a very small amount of space, but are fixed in memory and thus not as flexible as stored software).

Intellect: Each Function Pick adds to the chance that the Robot will be able to perform independent (not pre-programmed) courses of action which are logical, given a set of circumstance and based on available programming and information.

EXAMPLE: A Combat Bot is programmed to destroy all Trojan class AFV's (Armored Fighting Vehicles) it encounters. It also has an intrinsic +50 intellect bonus. It is given detailed data on the appearance of a Trojan AFV. Therefore, if it sees a different type of GCF, there is no chance that it might destroy the other type, as that is counter to programming. However, say that the Bot encounters a Trojan AFV and incapacitates it. Several humanoid survivors scamper out, trying to escape. The Bot sees them. Analysis says that they are not Trojan AFV's; however, they came out of one, and might be considered undestroyed parts of one. The Bot would make an Intellect

roll, needing to roll over 100. To the roll it adds 50 for its bonus, and if the total were 100 it would be able to make the decision to destroy the escapees (assuming of course that there is no other programming specifically telling it not to destroy humanoids).

Manipulate: The ability to utilize tools and controls. Ability with different types of tool/control should be treated as different Functions, and thus developed separately.



4.222 Other Vehicles

GCV's, ships (marine craft) Aircraft and small spacecraft are all considered together in this section, and all use the similarly named construction table, 4.224 below, for design purposes. The concept is identical to Robot Construction, with only the individual Class and Function types varying.

VEHICLE CLASSES

GCV: This term (Ground Conveyance Vehicle) covers many types of ground-related conveyance machines, including automobiles, low-flying scout craft and military and para-military vehicles. The key distinction between GCV's and 'aircraft' is that GCV's invariably require a solid surface on or above which to operate.

Aircraft: This broad term encompasses atmospheric interceptors, ground attack units, N-space shuttles and SMAC (Singly Manned Attack Conveyance) Fighters. The aircraft section can actually be broken down into *Small Spacecraft* and *True Atmospheric Vehicles*. Naturally the latter will require a more aerodynamic design (as will the former if they enter a planetary atmosphere). The GM must use common sense when designing the vehicles (for instance, obviously props will not wopk too well on a planet with no atmosphere).

Watercraft: Though of limited usefulness in **Space Master**, these ocean-going vessels are still employed on low-technology worlds. Variations might also be found on such worlds as Gas giants, where the atmosphere is semi-liquid layers. There, such devices as hydrofoils might find new purpose.

FUNCTION DESCRIPTIONS

Remember, when allocating Function picks (bought with Function Rating Points) that for many Functions (Maneuvering, Screens, Radiation Shielding, EW and Equipment interface) the first ten Function Rating Picks/Levels are valued a +5 bonus each, the second ten a +2 bonus each, the third ten a +1 bonus, and all afterwards 1/2 point, just like Character skill picks.

Aerodynamics:

FR Level	Notes
0	Could be mistaken for a pile of junk.
1	No attempt at pleasing appearance.
2	Some hint of cohesive design.
3-4	Minimum required for GEM motivation use.
5	Fairly sleek lines.
6	Minimum required for Hydrofoil use.
7-8	Minimum required for atmospheric flight.
9-10	Necessary for high-speed flight (above 50 kph)

Computer Mk #: As per normal computer rules, the Comp Mk. # is that system's simultaneous processing capacity in its CPU. Program memory volume capacity is 2x the Mk. #. Remembering from section 2, the *Reserve Memory* volume is ten times the Mk. #, but less accessible.

Power:

FR Level	Notes
0	Unpowered and rather useless.
1	Batteries: 10 hours full power before recharge.
2	Batteries: 20 hours full power before recharge.
3	Combustion engine: 50 hours full power before refueling.
4	Combustion engine: 100 hours full power before refueling.
5	Capacitors: 100 hours power before recharge.
6	Capacitors: 150 hours power before recharge.
7	Fusion Reactor: 10 days power before refueling.
8	Fusion Reactor: 20 days power before refueling.
9	Fusion Reactor: 50 days power before refueling.
10	Fusion Reactor: 100 days power before refueling.
11	Matter/Antimatter Reactor: 100 days power before refueling.
12-20	Matter/Antimatter reactor; each level above 11 adds 50 days operating time before refueling.

These power expenditure times assume full operational status (full cruising speed); time can be conserved by reducing energy expenditure — the exact amount to be determined by the GM. Also, Power form must be matched to Motive Form. (Fusion rockets require — at least — a fusion reactor).

NOTE: The per-pick cost for Power (as well as Motive Form) is based on the total picks to be used for the Vehicle, to reflect the mass to be powered and moved. The total picks to be used must be decided on before these Functions are picked, and the cost per Function Rating Pick = (Total Picks/50). "Total Picks" as defined here, do not include Power.

An integral energy weapon failure resulting in a 'power depleted' condition indicates a capacitance drain and that weapon is inoperative for 1-5 rounds.

Keep in mind that combustion engines are more susceptible to breakdown that Fusion Reactors, and are banned on some planets because of their exhaust.

Motive Form:

GCV's

FR Level	Notes (see Movement Chart 4.24 for actual speeds)
1	Slow wheeled.
2	Medium wheeled; Slow tracked.
3	Fast wheeled; Medium tracked.
4	Fast tracked.
5	Slow GEM (Ground Effect Machine).
6	Slow Gravitics; Medium GEM.
7	Walker
8	Hydrofoil; Medium Gravitics.
9	Jets
10	Fast Gravitics

Motive Form descriptions: (GCV's ONLY) It is possible for a vehicle to have two or more motive forms, but they must be developed separately, and each additional Motive form requires 1.5x as many points per pick as the previous one. *Walk* assumes a vehicle with leg-like limbs; *Hydrofoil* assumes aquatic capacity, and has a fixed speed range: 40-80 kph; *GEM* assumes standard max 1 meter altitude and require atmosphere; *Jets* are maneuvering turbofans, 3m maximum vertical lift; *Gravitics* are low-concentration, maximum 10m vertical lift.

SHIPS:

FR Level	Notes (see Movement Chart 4.24 for actual speeds)
1	Slow surface
2	Medium surface
3	Fast surface
4	Hydrofoil
5	Hydroskimmer
6	Slow submersible
7	Medium submersible
8	Fast submersible
9	GEM and surface
10	GEM and submersible

Motive Form descriptions: (WATERCRAFT ONLY) It is possible for a vehicle to have two or more motive forms, but they must be developed separately, and each additional Motive form requires 1.5x as many points per pick as the previous one. *Hydrofoil* assumes aquatic capacity, and has a fixed speed range: 40-80 kph; *Hydroskimmer* is a similar concept, but has a speed range of 60-120 kph; *GEM* assumes standard max 1 meter altitude and requires atmosphere.

AIRCRAFT

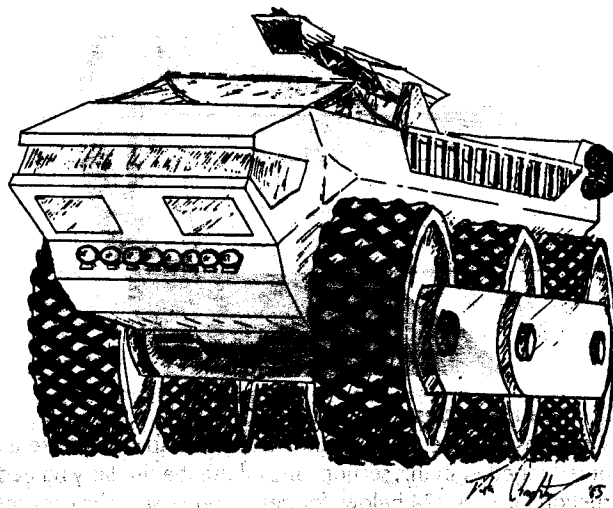
FR Level	Notes (see Movement Chart 4.24 for actual speeds)
1	Slow prop.
2	Medium prop.
3	Slow jet.
4	Fast prop.
5	Medium jet.
6	Fast jet or Medium gravitics
7	Fast jet with Gravitic lift or Fast gravitics
8	Hydrogen Rocket jet with Gravitic lift.
9	Fusion boosters with Gravitic lift (orbit capable).
10	Fusion engine (N-space capable) with Gravitic lift.

Motive Form descriptions: (AIRCRAFT ONLY) It is possible for a vehicle to have two or more motive forms, but they must be developed separately, and each additional Motive form requires twice as many points per pick as the previous one. *Prop* indicates propeller driven; *jet* indicates standard turbofan (requires combustible fuel); *Gravitic Lift* indicates that vertical maneuvering is controlled by gravitics (requires gravity well) allowing for vertical takeoff and landing as well as hover and precise maneuvering; *Hydrogen rocket jet* is a clean, efficient hydrogen-fueled jet; *Fusion boosters or Fusion engine* is self-contained fusion-powered rocket.

NOTE: The per-pick cost for Motive Form (as well as Power) is based on the total picks to be used for the vehicle, to reflect the mass to be powered and moved. The total picks to be used must be decided on before these Functions are picked, and the cost per Function Rating Pick = (Total Picks/50).

Maneuvering: For all vehicles except N-Space vehicles, the Function Rating level indicates the maneuver bonus for the craft. For N-Space capable craft, the picks purchased grant an N-Space acceleration rating, just like Starships.

See Starship Construction Rules (sec 4.21) to find the correlation between # of picks and sublight acceleration rating.



Armor Type:

FR Lvl	AT	Description	Maneuver/ DB penalty
1	21	No Armor (framework only)	0
2	22	Light Steel	-5
3	23	Reinforced Steel	-10
4	24	Aligned Crystalline Steel	-15
5	25	Alloyed ACS Armor	-25
6	26	Double Hull	-35
7	27	Double Reinforced Hull	-40
8	28	Double Heavy Steel	-50
9	29	Ardinium	-10
10	30	Ordium II	-5

Note: superior alloys are available at a cost multiplier (though requiring no extra Function picks) which give the vehicle an additional DB or reduces the maneuver penalty.

Cost Multiplier Bonus

(x2)	+5 to maneuver bonus or DB
(x5)	+10 to maneuver bonus or DB
(x10)	+15 to maneuver bonus or DB
(x15)	+20 to maneuver bonus or DB
(x20)	+25 to maneuver bonus or DB

Concussion Hits: Each Function level purchased allows the Vehicle to take 10 concussion hits before being rendered inoperable (GCV's cannot move or fire; Aircraft drop like rocks, ships are 'dead in the water'). If a Vehicle takes double its total concussion hits, it is Extremely, Severely Damaged.

Screens/Shields: The Function Rating reflects the DB for this defensive shielding. Vehicles use Barrier Shields (like Starships) rather than the less powerful personal shields, because the former are equally effective against all forms of attack, more dependable, and the additional power drain is not significant when a large power source is used.

Radiation Shielding: Each Rating level generates a reduction directly on the Radiation Critical Chart, when occupants of a unit are subjected to radiation.

4.223 ROBOT CONSTRUCTION CHART

ROBOT CLASS	PHYSICAL PARAMETERS															WEAPON FUNCTIONS	GENERAL FUNCTIONS				SPECIAL FUNCTIONS			
	Computer Mk.	Power	Motive Form	Maneuvering	Armor (Personal AI)	Armor (Construction AI)	Concussion Hits	Shields	Radiation Shielding	Hard Data Printout	Audio/Visual Reception	Weapon Installation	Sensors	EW/Stealth	Equipment Interface	1-h melee 2-h melee 1-h projectile 2-h projectile 1-h energy 2-h energy	Climbing	Xeno-environments	Stalk and Hide	Perception	Ambush	Oration (audio comm)	Intellect	Manipulate
Service Bot	3	x	y	3	1	10	2	5	3	1	1	8	3	7	2	3/5/7	4	2	5	2	5	3	4	1
Mech Interface Bot	1	x	y	2	1	12	2	6	3	1	1	7	1	7	1	2/3/5	5	5	4	1	4	3	1	1
Human Rel. Bot	2	x	y	1	1	15	3	7	4	2	1	10	3	8	3	2/4/7	3	3	3	1	3	1	1	1
Combat Bot	3	x	y	1	1	5	1	2	1	4	1	1	1	2	5	1/2/3/4/7	2	1	2	1	3	4	2	4

Key: The number indicates the number of points required to purchase one Function Rating Pick. See text (4.221) for details of Function definitions. "x", the cost per pick for Power Function Ratings, is dependant on the total picks for the unit. "y", the cost per pick for Motive Form, is dependant on the total number of picks for the unit (minus Power — the pick calculation for Power is done after Motive Form).

Special Notes:

Weapons Installation: Each pick equals one weapon Mk. #. See the text for details of weapon rating limitations. When utilizing mounted projectile weapons, one Rating Pick equals the volume for one magazine (usually five projectiles). Be sure to add the additional cost for actual missiles/torpedoes.

Weapons Functions: Weapons functions are the ability of the Robot to utilize normal handheld weapons. The numbers may be assigned to whichever weapons the designer desires (a Service Bot can develop a rating in 1-h projectile at a cost of 3 per rating pick; 2-h projectile at 5 per rating pick, and 1-h Energy at 7 per rating pick, for example).

4.224 VEHICULAR CONSTRUCTION CHART

VEHICLE CLASS	PHYSICAL PARAMETERS							GENERAL FUNCTIONS							
	Aerodynamics	Computer Mk. #	Power	Motive Form	Maneuvering	Construction Armor Type	Concussion Hits	Shields	Radiation Shielding	Weapon Installation	Sensors	EW/Stealth	Mech Interface	Cargo/Crew	Environmental Protection
GCV	1	2	x	y	4	5	5	5	1	2	1	5	10	2	2
AIRCRAFT	3	5	x	y	2	15	8	8	5	5	1	5	10	5	3
SHIP	2	2	x	y	6	3	2	4	2	1	1	3	10	1	2

Key: The number indicates the number of points required to purchase one Function Rating Pick. See text (4.222) for details of Function definitions. "x", the cost per pick for Power Function Ratings, is dependant on the total picks for the unit. "y", the cost per pick for Motive Form, is dependant on the total number of picks for the unit (minus Power — the pick calculation for Power is done after Motive Form).

Special Notes:

Weapons Installation: Each pick equals one weapon Mk. #. See the text for details of weapon rating limitations. When utilizing mounted projectile weapons, one Rating Pick equals the volume for one magazine (usually five projectiles). Be sure to add the additional cost for actual missiles/torpedoes.

Weapon Installation: The development cost represents the cost to purchase each Mk # of all weapons installations to be placed in the unit *in addition to the cost of the weapons themselves*. See Starship Parts Costs, sec 4.212 or weapons costs sec 3.12 (depending on weapon size). This category is also used to purchase missile launchers. Remember that missile ammunition must also be bought and stored. A robot interface adds 10% to the total weapon installation cost.

Sensors: This category allows sensor analysis (as a Multiscanner, see sec 3.11) up to 1 km per FR pick for GCV's and Ships, 10 km per pick for Aircraft, and 1000 km per pick for N-Space capable craft — while in space. They are limited as above while in those environments. The increased range is because of reduced interference from ground clutter, atmosphere, etc. Function Rating Picks in this category also include communications capability of similar range.

EW/Stealth: Purchase of EW FR picks allows use of Stealth and Jamming properties akin to those utilized by Starships (see Stealth/EW, sec 6.2).

Ammunition Storage: Each Function Rating Pick purchased allows the unit to store 50 Mk. worth of non-energy ammunition.

Mech Interface: Each level purchased represents one on-board system (piloting, a weapon, power control, sensors, etc) which can be operated by a Mech Interface Robot.

Cargo/Personnel: Each FR level purchased allows the unit to transport up to 10 cumets of equipment or 5 men (with equipment) or 2 heavily armored men. Note that space allowances for must be made here.

Environmental Protection: Each level purchased gives the unit one environmental protection/support system (vs vacuum, cold, heat, null gravity, etc. For instance, the usual N-Space capable Fighter must have Vacuum protection (air), heat or cold protection, and some have interior gravitic control. Thus, potential for four picks.

HUD bonus: Each pick grants a bonus for one gunner. See Starship construction rules, section 4.21.

Future Law Character Development stats are used here, so if another system is being used the GM should convert the given stats as closely as possible to his/her system. Five of the ten stats are linked to the Brain: Intuition, Empathy, Self-Discipline, Memory, and Reasoning, while the other five are associated with the body: Strength, Quickness, Presence, Constitution, and Agility.

Physical Capabilities:

The theoretical standard Android body has 100's in all its physical attributes (Temporary and Potential, reflecting a +25 bonus). This bonus can be enhanced further by using improved, more expensive systems, instead of the 'standard parts'. See the cost chart at the end of the section for the standard system prices.



ANDROID : RECREATIONAL

4.23 ANDROID CONSTRUCTION

Constructing an Android is conceptually somewhere between constructing a Robot and creating an Alterant Replicant, and usually more expensive than either. It is recommended that the GM read over the Replicant rules to familiarize him/herself with the general concepts and difficulties so that they will better understand the mental facets of Android construction. Scientists designing an Android use the averaged skills of Cybernetics and Electronics. Techs building an Android use the average of their Cybernetic Tech and Electronic Tech skills. Android body construction should be considered a *Very Complex* procedure, and linking the body to the Molecutronic brain is another, *Very Complex*, operation.

4.231 Stat Development and Bonuses

An Android should be considered as being in two distinct and separate parts: the body and the mind, the 'mind' in this case being the Android Molecutronic Brain, a semi-living substance which stores and processes information in a way similar to that of the human brain — although more quickly and efficiently. Molecutronic brains also 'die' if their supply of energy is cut off, losing all memory. It is possible to place such a brain in another housing, such as a robot or vehicle, but it is generally considered a waste of the brain's unique learning (self-programming) potential.

Since they are no more difficult to install, these systems do not make the construction roll more difficult. They are, however, more costly, as can be seen below:

Cost Multiplier	System bonus *
(x2)	+ 5 voice or appearance.
(x5)	+ 5 muscular or skeletal; + 10 voice or appear.
(x10)	+ 5 energy or nervous; + 10 musc or skel; + 15 voice or appear.
(x20)	+ 10 energy or nervous; + 15 musc or skel; + 20 voice or appear.
(x50)	+ 15 energy or nervous; + 20 musc or skel; + 25 voice or appear.
(x100)	+ 20 energy or nervous; + 25 musc or skel; + 30 voice or appear.
(x200)	+ 25 energy or nervous; + 30 musc or skel.

* Note that this is the cost and bonus for a system, however, to be applied as stat bonuses, two or more systems are involved:

Improved Strength: (skeletal and muscular systems)

Improved Quickness: (muscular and nervous systems)

Improved Agility: (" " " ")

Improved Presence: (voice, appearance)

Improved Constitution: (skeletal and energy systems)

EXAMPLE: Ryk the Engineer has done his research to build an Android and is purchasing the needed parts. He wants his Android to have a +10 Presence and +10 Agility (i.e., a +35 total in each, including intrinsic bonuses). To do this, his Android must have +10 quality versions of all the following: Musculature, Nervous system, Voice, and Appearance. Note that other factors which only have one applicable enhanced system (such as Strength, for instance, for which only Musculature was improved) gain no bonus, because the skeleton could not take the strain should the improved muscles be used to capacity. Thus, strength is +0. If Ryk spent the money to buy a +10 skeleton, his Android would thus have a +10 strength bonus as well. (then he would only need to buy a +10 energy system to enhance his Android's constitution...)

After initial construction, the physical systems cannot be altered without a complete physical overhaul (a Complex operation).

Mental capabilities:

The stats of the molecutronic brain, once activated, are all 90 (Temporary). To determine potentials, roll one D10 adding two points. Potentials are rolled, then each is assigned to a desired stat. Android mental stats move toward their potential just as the Player Characters do. Note that this can generate stats as high as 102.

General attitudes and tendencies can also be programmed in, such as aggressiveness, compassion, specific fears, hatreds or loves, and prohibitions (such as refusing to kill a humanoid), and loyalty to a specific individual. Although none of these are absolutely guaranteed, as the brain is self-programming, and, after a point, self-motivating, the Android should be almost incapable of disobeying explicit program directives.

Note: The GM may wish to institute a "secret" percentage chance of a hidden flaw in the Android Brain, such as a hidden hatred; homicidal tendencies triggered by an unlikely event, etc. This 'unreliability' would explain a racial dislike for Androids in some areas, if that is desired.

4.232 Skill Development

The Android chooses a profession, and makes skill picks, etc. It 'matures' after a fashion, as it goes through a ten year period of development during which it gains its adolescent and apprenticeship skill levels (this ten year period can be bypassed via intense programming, but this involves expensive "Background Data", as well as an additional Complex operation. Also, this data is rather basic, and of necessity lacking in trivial — yet helpful — background 'experience'). In general though, an Android develops and learns just like a PC with the following exceptions: Androids cannot be Telepathic; and Androids do not pick Body Development boxes. See below for Android repair information.

4.233 Androids in Combat

In combat and most other areas of day-to-day play, an Android should be considered a sentient being: subject to attacks and criticals as would a normal Sentient. For example, an Android would 'bleed' precious lubricating and power fluids, and it could be 'stunned' by a serious strike which might temporarily incapacitate its system (the GM may wish to have Androids more resistant to stuns, however, perhaps being stunned for only half as long, or, for instance, subtracting 1 from any stun total).

However, Androids do not 'lose consciousness'; all take 200 hits plus their total Con bonus before being incapacitated. Most Androids have a built-in safety mechanism which causes them to 'play dead' long before that point is reached, so they can repair themselves later (unless analysis of the situation tells them that playing dead will do no good).

Another important factor about Androids is their superior AT: Android flesh is AT 4 (rather than normal Sentient AT 1). Furthermore, Androids with a musculature and skeleton of +20 or better have an effective AT of 11.

4.234 Android Physiology and Repair

Androids do not eat, although they can drink and process liquids, eliminating them the same way sentients do. Their body extracts any needed hydrogen to fuel their internal high-efficiency microfusion reactor: the Android power center ('heart'). Supplemental water is stored in the stomach area to keep eyes and mucous membranes moist, for a complete 'living' appearance. Androids seem to breathe, though it is an artificial convention, as are pulse and heartbeat.

The most advanced Android designs are absolutely indistinguishable from a living being to human senses, and some are fully capable of all applicable Sentient physiological functions. Some cultures consider Android capability of certain functions to be an abomination.

Androids can be equipped with 'special abilities' just as Alterant Replicants and mutations. The GM should review the special abilities section below and assign costs for each. Naturally, an Android would not have corresponding physiological problems associated with most special abilities. In addition, other special sense or manipulation skills are possible.

Androids do not 'heal' as do living Sentients; they must be repaired. Simple concussion hit damage can be dealt with using a Compact Repair Kit, which includes a container of substance nearly identical to the Android flesh, and a device very similar to the Medical Dermal Closer. The Android (assuming he/she has boxes in Cybertechnics and is not incapacitated) can perform these simple repairs easily at the rate of 10 hits per round.

For more severe damage, such as 'muscle' or 'bone' damage, a Major Repair Kit is necessary. This "kit" is actually a set of two 1/2 cumet containers holding a portable computer and a number of very specialized devices and materials. The computer is programmed with necessary specialized Android anatomy data, and acts as a guide for repair/reconstruction purposes. For these serious repairs,

the Malfunction/Repair table should be consulted. Match the severity of the critical with the repair column (Routine = "A"; Light = "B"; Moderate = "C"; Severe = "D"; Very Severe = "E" (not using the Extremely Severe column) and use the critical roll(s) as a subtraction from the repair roll(s). Treat "66" as "100". Separate criticals require separate repairs.

EXAMPLE: An 87 "C" critical is rolled on Billy the Android. Therefore, to repair the damage, the Moderate column of the Repair/Malfunction table is used. Billy's owner Ryk has a 60 Cybernetic Tech bonus, and rolls a 65. $65 + 60 = 125$, minus 87 equals 38. Thus, a 38, which reads 20 minutes to repair with 10% CIP (cost in parts). The 10% is ten percent of the damaged area, which the GM much subjectively decide the approximate value of.

Naturally there will be inconsistencies between the actual critical to the Android and the written crit on the table designed for living beings, but the GM is urged to extrapolate to the nearest mechanical equivalent. In some instances (such as a destroyed eye or heart) a replacement is obviously necessary, and the Repair Chart alone is not enough. Unless there are specific replacements available (they could be purchased ahead of time) the Android will be crippled until such replacements can be found.

4.235 Android Parts Cost Chart

Equipment/Material	Cost
Molecutronic Brain	50,000
Complete Workshop	1.5 million
Vocal System	2,000
External (appearance) System	3,000
Energy/Power System	20,000
Muscular System	5,000
Nervous System	10,000
Skeletal System	7,500
Visual Sensors (eyes; 2)	3,000 *
Audio Sensors (ears; 2)	1,500 *
Compact Repair Kit	300
Simulskin refill (repairs 200 hits)	20
Major Repair Kit	2,500

See section 4.231 for details on cost multipliers for superior systems. The Complete Workshop contains all tools and equipment necessary to construct an Android, including a computer and interfaces to program the Molecutronic brain, but no actual supplies.

* Superior versions can be obtained (at a higher cost).

4.24 VEHICULAR MOVEMENT TABLE

(all speeds in kph unless otherwise noted)

MOTIVE FORM	TERRAIN TYPE												
	Road	Trail	Clear	Down-slope	Up-slope	Rough	Woods	Swamp	Water	Ocean	Sub-merg.	Dense Atmos	Thin Atmos
Slow Wheeled	50	30	30	+10	-10	10	-	-	-	-	-	-	-
Med. Wheeled	100	60	50	+20	-20	20	-	-	-	-	-	-	-
Fast Wheeled	300	200	150	+20	-20	20	-	-	-	-	-	-	-
Slow Tracked	35	30	30	+10	-10	25	10	-	-	-	-	-	-
Med. Tracked	50	40	40	+10	-10	30	15	-	-	-	-	-	-
Fast Tracked	150	100	80	+10	-10	40	20	-	-	-	-	-	-
Walker	50	40	40	-5	-10	40	20	10	-	-	-	-	-
Slow GEM	50	50	50	+10	-10	40	10	50	50	40	-	-	-
Med. GEM	100	100	100	+10	-10	80	20	100	100	80	-	-	-
Fast GEM	300	300	300	+20	-10	100	30	150	150	120	-	-	-
Slow Gravitic	100	100	100	+20	-5	100	50	100	100	100	-	100*	-
Med. Gravitic	200	200	200	+20	-0	200	50	200	200	200	-	300*	400*
Fast Gravitic	500	500	500	+20	-0	300	50	300	300	300	-	500*	800*
Slow Submer.	-	-	-	-	-	-	-	-	15	15	10	-	-
Med. Submer.	-	-	-	-	-	-	-	-	40	40	30	-	-
Fast Submer.	-	-	-	-	-	-	-	-	120	100	150	-	-
Slow Hydrofoil	-	-	-	-	-	-	-	30	60	50	-	-	-
Fast Hydrofoil	-	-	-	-	-	-	-	50	150	120	-	-	-
Hydroskimmer	-	-	-	-	-	-	-	40	250	200	-	-	-
Slow Hydroprop	-	-	-	-	-	-	-	20	40	40	-	-	-
Fast Hydroprop	-	-	-	-	-	-	-	35	75	60	-	-	-
Slow Prop	-	-	-	-	-	-	-	-	-	-	-	150	120
Med. Prop	-	-	-	-	-	-	-	-	-	-	-	400	350
Fast Prop	-	-	-	-	-	-	-	-	-	-	-	750	700
Slow Jet	-	-	-	-	-	-	-	-	-	-	-	500	1000
Med. Jet	-	-	-	-	-	-	-	-	-	-	-	1000	2500
Fast Jet	-	-	-	-	-	-	-	-	-	-	-	1800	3200
Chem Rocket	-	-	-	-	-	-	-	-	-	-	-	2000	4000
Fusion Rocket	-	-	-	-	-	-	-	-	-	-	-	2400	5000

* indicates speeds only attainable by gravitic vehicles capable of high-altitude lift.

4.3 ORGANISMS

In the universe of **Space Master** some cultures have made an art of genetic manipulation. Engineered microbes and other tiny organisms serve as everything from food to computers to garbage consumers. On many planets can be found plants and animals created specifically for certain environments and for certain functions. Cloning of Sentients has become (relatively) simple, and even artificially constructed and bred people are possible.

The GM should keep in mind that, even in the far future the social ramifications of some of these things would be significant: racial resentment of Alterant Replicants; mistrust of Clones, perhaps because of 'tampering' by the Genetic engineers, etc. For more on the social and cultural aspect of Genetic Engineering, see **Future Law**.

4.31 MICRO-ORGANISMS

4.311 Guidelines for Creation

The possibilities for engineering custom-made micro-organisms are virtually limitless; they are the origin of many drugs used for healing in **Space Master**, as well as poisons. The GM must make judgements here, although the engineering of micro-organisms is usually less complex than such undertakings as an Alterant Replicant. *Moderate* is applicable for most simple tasks. Genetic Tech skills are used for construction in this area.

4.32 COMPLEX ORGANISMS

4.321 Alterant Replication

Alterant Replication is a process whereby a living fetus is altered by artificial means at the genetic level to produce an different (usually improved in some way) being or creature. The Research/Construction chart is used, and — in general — the greater the abilities of the new Replicant, the more difficult the operation.

Conceptually similar to the simpler genetic alterations, Replication involves implanting new genetic material into a fetus ('blank' fetuses are produced in large numbers using a modified cloning process) and growing the prepared fetus at an accelerated rate in a special tank.

Very expensive, sophisticated machinery is necessary to perform the operation of altering the chromosomal structure to the new form, involving extensive programming and delicate operations. Once the fetus has been altered, it is placed in a growth tank to develop to the desired maturity: 100 days to full growth (20 year-old equivalent for full maturity; with five days in the tank equalling 1 year if the Replicant is to be brought out pre-maturely and perhaps raised as a normal hominoid).

When creating a Replicant, first the appropriate research is required to determine exactly how the genes are to be altered. Genetics is the Scientific skill used. If the desired Replicant type has already been created by someone else (this can be determined by a percentage roll, likelihood determined by the GM) the Research is *Easy*. If it is a new type, research is *Very Complex*. The GM is urged to place restrictions on how powerful or sophisticated the designed Replicant can be. It is suggested that no special stat bonus exceed +30 (in addition to an intrinsic stat bonus) and that the average of all bonuses never exceed 15. These restrictions should be even lower for Eugenics Products (+20 maximum special stat bonuses, and a maximum total average of 12). Review the Race Abilities Table (4.7) for trends. Note the tendency towards lower Empathy and Intuition for Replicants and Eugenics people, due primarily to an inevitable "attitude problem" which occurs in superior beings. For Replicants, Empathy and Intuition starts at -20 for purposes of modification, and for Eugenic products, these stats start at -10. For Construction, Genetics Technics is used, and Replicant Construction is always **Very Complex** unless otherwise noted.

An additional difficulty factor should be assigned, depending on how many special abilities the Replicant will have, and how good its stats will be. For instance, in the **Race Abilities Chart** (sec 4.7) when averaging all the stat bonuses, the Type I (warrior) has a +35 average bonus. Thus, the creator of this Replicant might be given a 35 (10 x 3.5) modifier to his detriment (-35) when rolling to construct the Replicant. (If using data from a type already created, the difficulty modifier is *halved*). That is just the Stat modifier section. Also to be considered is the Resistance Roll modification section. As can be seen, all Replicants are at Base -50 vs. Channeling and Essence. They are intrinsically at this level because those Realms are virtually unknown in **Space Master**, and those who do know of them don't bother. Any improvement of those conditions must start from the -50 level. Against the other areas, Replicants start at +0, as with Stat modifiers.

In the area of healing and injury, (Refer to **Future Law**) Replicants' soul departure delay is two rounds; this is generally considered irrevocable. Stat deterioration is +5, but can be reduced at a cost of 5 modifier penalty per 1 point of deterioration decrease. Recovery factor is base 1.0, but can be improved (or reduced) at a modifier of +/- 5% per .5x of recovery rate.

Each 'Starting Language' costs in the form of a 10 modifier, and it is implanted and permanently known.

Hit dice start at D8, with a +5 cost per extra "side" of die roll. The flat bonus per level costs +10 per one point.

Max hits start at 100, and can be raised (not lowered in this case) at a rate of five hits per +1 modifier. The GM can also stipulate that the desired gene material for superior stats, bonuses and abilities must be *bought* specifically and installed at a base cost x the bonus as a multiplier (see costs 4.33).

Lifespan is generally set at approximately 50 years (after removal from the growth tank) and can be increased at a rate of: the number of years equivalent to modifier on a one-to-one correspondence; twenty extra years of life equals a 20 modifier. The lifespan can also be decreased, but at no bonus to the creator. Replicants do not age except very slightly, until their programmed expiration, at which point they age very rapidly (one year per hour) until death at a 100 year-old equivalent.

EXAMPLE: The first creator of the Type I (Warrior) Replicant's modifiers: +35 from total average Stat bonus enhancement, +40 for average RR enhancement, +5 due to reduced Stat deterioration, +5 from improved healing rate, 10 from two extra "die-sides" and +20 for two extra automatic hits/lvl. Total modifier: 115 to the creator's detriment. See the cost chart for associated expenses.

General physiological/appearance factors (sex, eye and hair color, skin tones, height and other body proportions, etc.) are set by the creator at no additional cost — within reason and subject to other factors: Replicants with superior strength are probably taller and definitely bulkier than average; those with great agility less so, etc.

Psychological background (in general) is pre-programmed as desired, including general attitudes and inclinations. Replicants frequently are unaware that they are Replicants, as false memory structures are easily purchased, modified slightly and implanted. Replicants who discover that they are a Replicant must roll a RR with SD as a modifier. If they fail (and depending on how badly) they will become depressed and unhappy and perhaps even commit suicide. Below is a small table which can be used to determine depression severity.

01-05	Criminally Suicidal (violent; secondarily Homicidal)
06-25	Suicidal.
26-50	Inactive/Semi-Comatose.
51-75	Surly and prone to RR's vs. respect for authority.
76-90	Deeply Depressed (-25 for all actions).
91-100	Depressed, at -5 for all activity.

Some can be helped with treatment (rolling additional RR's, one per month while in "intensive treatment", all at an additional - 50, modified by the therapist's Psychology bonus). An addition subtraction of -10 is added for each month of a failed RR). If they succeed, they are cured.

When the Replicant is removed from the growth tank, his/her stats are rolled in the same manner as a Player-character, including Temps and Potentials, etc. Profession, as well as Adolescent and Apprenticeship skill selection are also pre-programmed. It is naturally assumed that the stats will be assigned to further enhance the programmed strengths of the Replicant. After "birth" from the tank, skill point selection is theoretically the decision of the Replicant, though naturally it will obey the wishes of its master if imprinted (see below) or whatever authority figures are available if it is suitably passive in that area.

Imprinting (the very strong bonding of the Replicant to — or against — a certain individual) is more involved. Imprinting is a special ability (see the Abilities List in Future Law, sec 6.2) and must be done within one day of the Replicant's emergence. The method is this: a subconscious 'trigger' is pre-implanted, with the desired inclination (devotion, love, selfless protectiveness, open dislike, cunning, murderous hatred, etc.) formed into a phrase in one of the *Starting Languages*. When the phrase is spoken, the Replicant is exposed to the "imprintee" (or an image of same — a full color holograph is best) and thus *Imprinted*. Imprinting to more than one person is rarely effective and often results in damage and confusion to the Replicant.

4.322 Cloning

Cloning is much more straightforward than Alterant Replication, since genetic 'tinkering' is not involved. A living flesh sample is taken from the donor, and grown in a fetus propagation tank (different from and more complex than a regular growth tank). Successful completion of this phase alone is a *Very Complex* operation, and takes the time indicated on the chart. Then the fetus is prepared and placed in the normal growth tank for the term, again a (unmodified, except for the creator's Genetic Tech bonus) *Very Complex* task. After both operations are completely successful, the living Clone emerges. He or she has the exact Potential stats as the Donor (though Temps are at 1st level equivalent) and intrinsic abilities. The new Clone has no skills, however.

This problem can be avoided or corrected in two ways: The Clone can be awakened as an infant (after about 10 days in the growth tank) and trained. This may result in slightly different skill development (the GM should enforce this possibility, since the new Clone is a person, and just as capable of independent thought and free will as the donor).

Alternatively, the Clone can receive memories from the clone sample donor. This is invariably traumatic, and can possibly kill or mentally damage the Clone. The proper "Memory Transfer" equipment is required, and a roll on the *Hard* column of the Research/Construction table is needed. If 100% success is not achieved immediately, the Clone must make a RR, with Memory as a modifier. If he fails, there is a 20% chance of death (irreversible in this case). If the Clone survives, his Potential Memory and Reasoning is reduced by the number equal to the amount less than 100 rolled to awaken the memories, and its actual skill knowledge is reduced by the same amount. Subsequent attempts to restore memories after the Clone has failed once will definitely kill it. If the Clone resists, the Creator may roll again, attempting to complete the memory restoration. Assuming the restoration is successful, the Clone will have all memories and skills of the original, up to the point the sample was taken. **However**, the Clone is now a separate entity, and its environment immediately begins to take effect. There will be inevitable attitude divergences as the Clone has new experiences and makes its own choices.

EXAMPLE: Trevoc is trying to transfer the memories of someone into a clone of that person. He rolls a 77 (plus his 60 bonus = 137) On the chart, 137 indexes to 65% success. So, the Clone must make a RR. It's Temp Memory is 80, so a 20% chance of failure. Trevoc rolls 16. Oops, not high enough. Trevoc rolls the chance of death: 47. Well, it doesn't die, but its Memory and Reasoning are reduced by 35 (100 - 65 = 35). His 87 Pot. Memory is now 52, and his 76 potential Reasoning is now 41. Not good. Also, 35% of the Clone's background and skill knowledge is lost, the specifics to be decided by the GM, probably by assigning numbers to the total number of Trevoc's skills and rolling, removing those skills until about 35% are gone.

It is also possible to grow a Clone fetus, then proceed with Alterant Replication procedures, thus improving on an already existing set of Stats and personality traits. The result is a combination: whatever is not altered in the Replication process carries through from the original. This procedure is more delicate, however, and the RR's necessary when *Memory Restoration* is attempted on a normal Clone must be followed at every step of this Clone Alteration. Any failed RR by the fetus (using Adolescent level Temp Constitution during Alteration) results in death. Memory Restoration to an Alterant Clone is done in the same way as normal Clones, except that failure of a RR by the Clone invariably results in death.

4.33 GENETIC MATERIALS COSTS CHART

Replication Equipment	Cost
Genetic Alteration Equipment	2 million
Growth tank w/monitors	600,000
Fluids for growth	500
Blank fetus (fertilized egg)	25,000 *
Additional genetic material	2,000 for + 5 *
Background History	5,000—50,000
Memory Transfer Equipment	150,000

* Price highly variable; often available only on the Black Market (3x normal cost, and lower quality and reliability). Genetic material cost is for genes providing a + 5 bonus in one stat. The cost doubles for each additional + 5.

4.4 GROUP RESEARCH AND CONSTRUCTION

Group research is almost always more productive than individual, and below are the factors to be included. Keep in mind that adequate facilities for the group are necessary for their full efficiency to be realized.

4.41 SINGLE SCIENCE/TECH PROJECT

A situation in which one skill is clearly the central one and any others are relatively irrelevant. Everyone on the 'team' must possess this skill bonus, and all the people's bonuses are averaged. The roll is also modified by the number of people in the team: for each person (more than one and up to ten) on the team, add + 5 to the roll; for every one over ten (up to 20) add + 2; every one after twenty add + 1. The time listed on the chart should also be halved each time a person is added.

EXAMPLE: A project that would take one person 100 hours takes two people 50 hours, three people 25 hours, four people 12.5 hours, etc.

4.42 MULTIPLE SCIENCE/TECH PROJECT

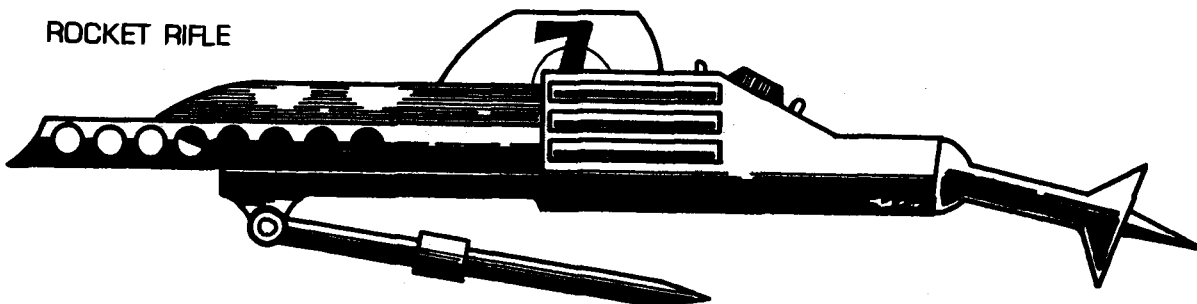
When a project seems to fall under several categories, the major applicable skills are averaged. Each person on the team need only know at least one of the necessary skills. Bonuses are as above, and the time is also halved as above.

4.5 CONSTRUCTION AND RESEARCH CHART

	Routine	EASY	Moderate	Hard	Complex	Very Complex	Absurd
-151	Light malfunction to the equipment.	Moderate malfunction to the equipment.	Moderate malfunction to the equipment.	Moderate malfunction to the equipment.	Severe malfunction to the equipment.	Severe malfunction to the equipment. 10 days wasted.	Physically impossible
(-150) — (-101)	Routine malfunction to equipment.	Routine malfunction to equipment.	Routine malfunction to equipment.	Routine malfunction to equipment.	50 hours wasted; 50% of materials (clone, replicant, machine parts, etc.) destroyed due to errors.	No progress; 50 days wasted and 100% of materials destroyed due to error.	Project botched after one year. All materials lost.
(-100) — (-51)	5 ⁺ 5 minutes.	5% 40 mins.	Upgrade to HARD. Waste 1 hour.	5% 100 hours.	10 hours lost; 20% of materials destroyed due to error.	30 days into project a problem is encountered. Roll 50% chance project destroyed (if research wrong data) and must start from scratch, 50% no damage, but no progress.	5% 6 yrs. Slight progress, but equipment acts up: roll Very Severe malfunction.
(-50) — (-26)	10 ⁺ 2 minutes (12 rounds).	10% 40 mins.	5% 4 hours.	5% 80 hours.	5% 350 hours. If construction, 10% of material destroyed and must be replaced.	10% 100 days. If construction, 20% of material destroyed and must be replaced.	5% 5 yrs. If construction, 50% of materials damaged and must be replaced.
(-25) — 0	20% 1 minute (6 rounds).	10% 30 mins.	10% 2 hour.	10% 60 hours.	10% 350 hours.	20% 90 days. If construction, 10% of material destroyed and must be replaced.	5% 4 yrs. If construction, 20% of materials damaged and must be replaced.
01 — 20	40% 6 rounds.	30% 30 mins.	20% 1 hour.	20% 50 hours.	15% 350 hours.	10% 85 days.	5% 3 yrs. If construction, 10% of materials damaged and must be replaced.
21 — 40	60% 6 rounds.	50% 30 mins.	30% 50 mins.	25% 40 hours.	15% 300 hours.	15% 83 days.	5% 2 yrs.
41 — 55	80% 6 rounds.	70% 20 mins.	40% 50 mins.	30% 40 hours.	20% 300 hours.	20% 80 days.	5% 1.5 yrs.
56 — 65	90% 6 rounds.	95% 20 mins.	50% 40 mins.	35% 30 hours.	25% 300 hours.	30% 80 days.	5% 1 year.
66 — 75	95% 6 rounds.	95% 10 mins.	60% 40 mins.	40% 30 hours.	25% 250 hours.	30% 78 days.	6% 1 year.
76 — 85	99% 6 rounds.	99% 10 mins.	70% 35 mins.	45% 30 hours.	25% 250 hours.	35% 75 days.	7% 1 year.
86 — 95	100% 6 rounds.	99% 5 mins.	70% 30 mins.	50% 30 hours.	30% 250 hours.	35% 72 days.	8% 1 year.
96 — 105	100% 6 rounds.	99 ⁺ 2 mins.	95% 20 mins.	50% 30 hours.	40% 250 hours.	35% 70 days.	9% 1 year.
106 — 115	100% 5 rounds.	99 ⁺ 1 min.	98% 20 mins.	55% 25 hours.	40% 200 hours.	40% 69 days.	10% 1 year.
116 — 125	100% 4 rounds.	99 ⁺ 1 min.	99% 20 mins.	60% 25 hours.	40% 200 hours.	40% 64 days.	10% 300 days.
126 — 135	100% 4 rounds.	99 ⁺ 5 rounds.	100% 20 mins.	65% 25 hours.	45% 200 hours.	45% 60 days.	10% 250 days.
136 — 145	100% 3 rounds.	99 ⁺ 5 rounds.	100% 20 mins.	70% 25 hours.	50% 200 hours.	50% 57 days.	10% 200 days.
146 — 155	100% 3 rounds.	99 ⁺ 5 rounds.	100% 15 mins.	80% 25 hours.	50% 125 hours.	55% 53 days.	10% 150 days.
156 — 165	100% 2 rounds.	99 ⁺ 5 rounds.	100% 10 mins.	95% 25 hours.	50% 110 hours.	50% 51 days.	10% 120 days.
166+	100% 1 round.	100% 4 rounds.	100% 10 mins.	100% 20 hours.	60% 100 hours.	60% 50 days.	10% 100 days

NOTE: all percentages refer to the fraction of research / construction on the project that has been completed by the given roll. Times (unless otherwise noted) indicate the amount of time required to complete the given percentage of the project.

ROCKET RIFLE



4.6 CONSTRUCTION PICK WORKSHEET

[illegible]

4.7 ANDROID & REPLICANT STATS CHART

(all bonuses are cumulative)

Stat Bonus Modifications

ST QU PR IN EM CO AG ME RE SD

Replicant

Type I (Warrior)	+20	+20	+0	-20	-20	+10	+20	+0	+0	+5
Type II (Tech)	+0	+0	-10	+10	-20	+0	+20	+0	+20	+0
Type III (Clerical)	+0	+0	+10	-10	-10	+0	+0	+30	+10	+0
Type IV (Recrea.)	+5	+5	+30	-10	+0	+5	+5	-10	-10	+0

Androids

Warrior	+30	+20	+10	-20	-20	+30	+20	+0	+0	+10
Pilot	+10	+30	+10	+10	-20	+10	+30	+10	+30	+5
Tech	+0	+0	+10	+10	-20	+0	+30	+0	+30	+0
Protocol	+0	+0	+30	+10	+10	+0	+10	+20	+20	+0

RESISTANCE ROLL MODIFICATIONS

Essence Channels Mental Telepathy Poison Disease

Replicants

Type I (Warrior)	-50	-50	-20	+30	+30
Type II (Tech)	-50	-50	-10	+10	+10
Type III (Clerical)	-50	-50	+10	+10	+10
Type IV (Recrea.)	-50	-50	+0	+10	+20

Androids

Warrior	+20*	+20	+20	N/A	N/A
Pilot	+10	+10	+10	N/A	N/A
Tech	+10	+10	+10	N/A	N/A
Protocol	+10	+10	+10	N/A	N/A

HEALING AND INJURY

Soul Departure Recovery Multiplier Starting Lang's Type of Hit Die Max Hits

Replicants

Type I (Warrior)	2	.5x	3	D10+2	200
Type II (Tech)	2	.5x	5	D10	130
Type III (Secretary)	2	1.5x	8	D8	100
Type IV (Recrea.)	2	1x	3	D10	120

Androids

Warrior	12	N/A	N/A	D10+2	200
Pilot	12	N/A	N/A	D10	150
Tech	12	N/A	N/A	D10	120
Protocol	12	N/A	N/A	D10	120

Key to Healing and Injury codes: **Soul Departure:** rounds before the "Soul" of the being departs and he/she/it is no longer revivable. For Androids, this indicates the "death" of the Molecutronic Brain. **Recovery Multiplier:** this is a function of the relative time it takes for the being to heal. **Starting Languages:** The number of Languages initially known. **Type of Hit Die:** The die used when rolling to determine hits **Max Hits:** the maximum number of hits the being can take (plus Can bonus if using **Future Law**).

*The Resistance Roll Modifiers vs spells and Psions given for Androids reflect their RR against spells which effect 'inanimate' objects (such as spells which destroy certain materials). Androids are immune to Spells and Psions which affect living sentients, such as mind attacks and controls, and nervous system or muscular attacks.

5.0 PERSONAL COMBAT

Weapon terminology and useful abbreviations:

Automatic: Refers to any weapon which is capable of rapid-fire bursts of ammunition.

DB: Defensive Bonus: the total of a number of modifiers which affect how difficult it is to 'hit' an opponent.

Energy weapon: any distance weapon which projects an energy beam/burst as opposed to a physical projectile or missile weapon.

Fire: any distance weapon attack, this term corresponds to the "missile" concept in **Rolemaster**, but is broadened to encompass projectile and energy weaponry.

Melee: Hand-to-hand combat (as opposed to 'fire' combat) where opponents are physically engaged — be it a fistfight, a duel with rapiers, or a wrestling match. All of these are considered melee.

Missile weapon: In **Space Master** this indicates a weapon which manually fires an airborne projectile, such as an arrow from a bow or a quarrel from a crossbow. This does not include projectiles fired by explosions or other high-velocity propulsion means. Thrown weapons are also included in this area.

OB: Offensive Bonus: the total of a number of modifiers which affect an attacker's chances of hitting an opponent with a weapon.

Projectile weapon: As opposed to a *missile* weapon, this indicates a device which mechanically fires a high-velocity projectile.

Psion: Referring to Telepathic/Psionic power; the act of using such power. This corresponds to the **Rolemaster** term 'Spell' which refers to the use of a magical ability.

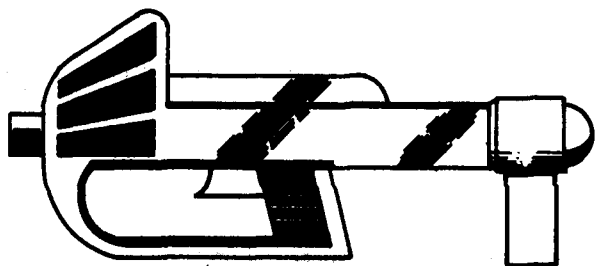
Self-Loading: Refers to any weapon which reloads itself and is ready for another shot almost immediately. All Energy weapons and most projectile weapons fall into this category, while bows and thrown weapons do not.

5.1 TACTICAL COMBAT SEQUENCE

5.11 BATTLE ROUND SEQUENCE

All combat in the **Rolemaster** systems takes place within a framework of ten-second rounds, in one-minute turns. Normally, each combatant is allowed one attack roll per round, whether it be a spell/psion, missile (bow fire) or melee. The rationale behind allowing missile and melee combatants only one roll every ten seconds is that, though he or she may actually swing or shoot more often than this, only one *effective* attack is made in a given round. This concept is preserved in spirit, though allowances have to be made for advanced weapons like submachine guns and plasma repeater rifles.

The combat sequence in **Space Master** is essentially the same as that used in the rest of the **Rolemaster** system, with a few additions necessary to incorporate the superior abilities of high-tech weaponry. The expanded **Space Master** combat round sequence is shown below, with the new additions asterisked. There are now two missile phases, the second one available only to those using a hand weapon which automatically reloads (i.e., not a bow, crossbow or throwing weapon). These missile phases are now called *Fire* phases. Examples are automatic pistols, revolvers, and any kind of energy weapon. These weapons can be fired more easily and frequently, and are thus offered two rolls during the round sequence. Any standard **Rolemaster** missile fire is done during the first missile phase (unless opportunity is specified). Details of exactly how self-reloading weapons are to be used are found later in this section.



BLASTER PISTOL

1. Spell/Psion Action Phase
2. Spell/Psion Results Phase
3. Spell/Psion Orientation Phase
4. Fire Phase (A)
5. Fire Result Phase (A)
6. Movement and Maneuver Phase
7. Fire Phase (B) *
8. Fire Results Phase (B) *
9. Melee Phase
10. Melee Result Phase
11. Final Orientation Phase

Spell/Psion Phase: All combatants who will use a Psion during this round must specify any pertinent information to the GM (spell type, target, option to wait for opportunity fire, etc.)

Spell/Psion Results Phase: All Psions specified in the previous phase are resolved simultaneously, unless an exception is indicated by the system or the GM. Effects are applied immediately, except spells held on opportunity. Movement for those who have cast a spell this round is reduced to a maximum of 10% of their normal allowance for that round.

Spell/Psion Orientation Phase: All combatants who performed unusual activities during the previous phase (i.e. Teleportation, etc.) must make an orientation roll. Exactly what constitutes unusual activity is at the discretion of the GM. Unconscious Spells/Psions are not, however, unusual activity, being intended for use without strain or loss of time.

Fire Phase (A): All combatants who will fire or throw missiles this round (cannot have cast a Spell/Psion) must specify missile type, target(s) and any other pertinent information.

Fire Result Phase (A): All missile attacks specified in the previous phase are resolved simultaneously, unless an exception is indicated. All results (except opportunity) are applied immediately. Movement for all combatants performing non-self-reloading missile attacks are reduced to a maximum of 25% of their normal activity allowance for that round (movement, maneuver, etc.). Users of self-reloading weapons have 50% of their activity remaining. For example, they may fire again in Fire Phase B, or move 50% of normal, or melee at 505, etc. See 5.12 for various missile/melee and movement combination options.

Movement and Maneuver Phase: All combatants in play may move up to the maximum of their movement allowance (depending on movement system, and any activity engaged in during the earlier phases) Those intending to move-and-fire (self-reloading weapons only — see 5.12) must declare so here. Success or failure of an extraordinary maneuver must be resolved on the maneuver chart.

Fire Phase (B): Same as the fire phase above, except that only self-reloading weapons users (or others who opted to hold their fire for opportunity) may fire again. Anyone firing this phase sacrifices all movement and melee ability for this round (except for those who chose to move-and-fire).

Fire Result Phase (B): Essentially the same as Result Phase (A) above.

Melee Phase: All combatants may attempt to engage in a melee attack except those who have done any of the following this round:

1. Cast a Spell/Psion;
2. Fired or thrown a missile (there are exceptions; see 5.12);
3. Used more than 50% of their activity for the round;
4. Failed an orientation or maneuver roll;
5. Announced opportunity action not yet performed or cancelled;
6. Been incapacitated.

Melee Result Phase: Within each group of combatants attempting to melee attack each other, attacks are conducted according to the following sequence:

1. Determine order in which combatants will swing by comparing initiative (determined by Quickness, and other factors, depending on circumstance).
2. First combatant attacks and results are applied immediately.
3. Second combatant, third combatant, etc., attack and apply results in order.
4. First combatant attacks with any useable second weapon (if he entered melee with a weapon in each hand).
5. Second, third combatants, etc., attack with second weapon, if any.

Final orientation Phase: In the judgement of the GM, any combatant under significant pressure or who has made an unusual maneuver may be required to make an orientation roll, which may affect his ability to act in the next round.

5.12 OPTIONS WITHIN THE SEQUENCE

5.121 Opportunity Action

Combatants may plot opportunity action if they wish to perform a combat activity in a following phase of the current round or a following round. For example, a combatant may wish to withhold his Fire attack until he sees who is moving where, and then fire. Opportunity action is announced during the correct phase for the desired action. Movement restrictions apply as if the combatant had actually performed the action during the correct phase. A combatant who has planned opportunity action can take no other action (except reduced movement) until the action is performed or cancelled. Opportunity fire occurs first in a phase, unless otherwise indicated by the GM.

NOTE: Self-reloading weapons users may opportunity fire in any two non-sequential action phases (1, 4, 6, 7, 9) if desired (Fire B and Melee, for instance) but may not fire twice in the same phase, or sequential action phases.

5.122 Fire-and-Melee

If a combatant is skilled in a particular throwing weapon or is skilled in using a self-reloading fire weapon with one hand while skilled with a melee weapon in the other, he may opt to throw/shoot with only a 20 subtraction from his OB during Fire Phase B, and engage in melee (in phase 9, of course) with a -20 to the melee bonus as well. This is only before a combatant actually enters melee. Of course, only a one-handed melee weapon is permissible in this situation, and no physical shield. The fire target should be the same as or very close to the impending melee target. In general, fire weapons cannot be used while engaged in melee.

5.123 Move-and-Fire

Anyone using a self-reloading weapon has the option of essentially combining his movement with Fire Phase B. In this way, the combatant (if he has not fired in Fire Phase A) may move 50% of his maximum movement allowance, and fire (during Phase B) at -30 to his OB. This option is useful for 'covering fire'. Alternatively, the combatant may move 25% of his maximum movement, and fire during both Fire phases at -50.

5.124 Two Targets

Anyone using a self-reloading weapon may decide to fire at two separate targets during the same round. However, the targets must be within 90° of each other from the attacker's viewpoint, and the firer subtracts 20 from each attack roll (in addition to any other modifiers).

5.2 DEFENSIVE CAPABILITIES IN COMBAT

In **Space Master**, as in the rest of **Rolemaster**, many factors affect the result of an attack. **Space Master** offers the defender new options with which to protect himself, some similar in concept to the Fantasy realm of **Rolemaster**, others new and completely different.

5.21 ARMOR

Below are listed the various general categories of armor and defensive clothing available in **Space Master**. For details see sec 3.311, and maneuver penalties, consult the Armor table, 3.13. Keep in mind that the armor type numbers listed on the table are adaptations from the basic **Rolemaster** armor types, which is why most of them incorporate DB modifiers as adjustments.

Light Body Armor: Usually made up of lightweight alloys or cloths such as Kevlar, these range from vest-sized coverings which provide limited torso protection up to full body outerwear.

Combat Body Suit: Heavier than a standard vacuum suit, this armor incorporates layers of kevlar material and light alloy reinforcement. This armor includes a helmet and can be sealed from the environment.

Combat Exoskeleton: True armor, the exoskeletons offer full-body coverage, the amount of rigid plating varying with subtype. Like the bodysuits, this armor can be sealed and used in lieu of a vacuum suit.

Powered Armor: The ultimate space armor, this group embraces full-body reinforced, rigid armor, maneuverable only with the help of servo-mechanisms, and even then great skill is required to operate it. Some powered armor is capable of atmospheric and even (limited) interplanetary travel, in addition to being frequently equipped with a variety of weapons. For more on Powered Armor, see Section 3.11 and 3.13.

5.22 PERSONAL SHIELDS

There are four basic types of personal shield, each with different strengths and weaknesses. See sec 3.11 (personal items) for detailed descriptions of personal shields.

5.23 DEFENSIVE BONUS

The sum of all bonuses and penalties that affect the defender's capability in combat is the adjusted *Defensive Bonus*. This number will be subtracted from the opponent's combat roll. The defender can possibly receive bonuses and/or penalties for superior armor, energy shields, his quickness, and his position.

5.231 Quickness

An addition to the defensive bonus can be given to a combatant with exceptional quickness. This bonus will depend on the system being used to determine the physical characteristics of the combatants. In **Space Master** it is based upon the Quickness Stat bonus (if using **Future Law**, see sec 2.4).

5.232 Position

A variable bonus can be awarded to the defender if his position in the combat, relative to the attacker, is judged sufficiently advantageous (for instance, behind a 150 cm wall could be -40). Penalties due to a defender's disadvantageous position (e.g. defender prone) are reflected in an attacker's offensive bonus (see table 5.93).

5.24 PARRYING OPTIONS

The defender may wish to place more emphasis on personal defense in combat than is implicit in this tactical system. A combatant may sacrifice some or all of his offensive bonus and movement capability in order to increase his melee and/or fire defense. In order to parry, a defender must have a weapon (useful against melee attacks only, with very few exceptions), a shield, a shield collector (as available with a Velocity shield) or a similar item or terrain feature (e.g., a tree, a large rock, a wall, etc.).

For melee parry, a combatant commits all or part of his melee OB to parrying. This part of offensive bonus is then added to his normal DB to give a new total DB. His OB is reduced by the amount that was added to defense.

Fire Parry is slightly more complex in **Space Master** than a fantasy environment due to the differing types of projectile, missile and energy weapons. If a combatant elects to devote some of his OB to parry fire attacks, he is so committed for both fire phases of the round (unless *Hasted* or otherwise in an accelerated mode). Naturally, this same amount is subtracted from whatever OB he has elected to use for that round, whether it be fire or melee. Note that the OB value, when used to parry thrown or missile (maximum of 1/2 OB) weapons, is at full value, and when against other fire is half-value. Also, the defender can only attempt to parry one attack (shot or burst) per phase, and the person whose attacks are being parried cannot change from fire phase A to fire phase B in a given round.

EXAMPLE: Ryk Selyk finds himself in a combat situation behind a 150 cm wall, armed with a blaster pistol. Two opponents are across the room, also behind a low wall, armed with weapons (we'll call them Creep X and Creep Z). Creep X has a pistol, Creep Z an automatic rifle. Ryk's normal DB is 20, and his OB is 100. Because of the wall his DB is 60 (+40 for this size wall). Deciding that this is still a bit too dangerous, Ryk opts to devote 50 of his 100 OB to parry. He is allowed to do this because he has a handy wall with which to parry (called 'ducking' in some cultures). Ryk's 50 becomes a 25 since he is parrying a fire weapon, and he selects to parry the Creep with the rifle. Ryk's DB is 85 against Creep Z and 60 against Creep X. The round begins, Ryk and the Creeps fire. No one is hit, and Creep Z's rifle jams (Ryk hears it — and the Creep swearing). Ryk's player wants to switch his parry to X, since Z won't be firing for awhile, but the action is too swift, and Ryk can't reorient that quickly. Ryk's player whines at the GM, but gets nowhere, as the GM knows the rules and stands fast. Next round he can re-direct his attention to duck Creep X more effectively.

5.3 OFFENSIVE CAPABILITIES IN COMBAT

The success of an attack will partially depend on the weapon or weapon combination used, and any offensive capabilities possessed by the attacker which can alter the combat roll in his favor. The factors which can affect the combat roll include a superior weapon, physical prowess, experience, position, special equipment, etc.

5.31 WEAPON COMBINATIONS

In **Space Master** a number of combinations are possible, ranging from sword and sword (covered more fully in **Rolemaster** to Blaster pistol and Blaster pistol). The GM must be very careful if he chooses to allow characters such combinations. Superior Agility, perhaps even ambidexterity must be prerequisites. If the GM allows a non-ambidextrous PC to fight with two weapons, the off-hand should be considered at -20. Even when this is allowed, the character should be allowed only one target per round (unless *hasted*).

5.32 OFFENSIVE BONUS

The Offensive Bonus is the sum of the bonuses and penalties that affect an attacker's capability in combat. This number is added to the combat roll. The attacker can possibly receive bonuses and/or penalties from a superior weapon, physical prowess, expertise, position, etc.

Superior Weapon: An especially good weapon in terms of material, construction, or ammunition can result in additions to the OB.

Physical Prowess: A combatant with exceptional Strength, Quickness, Self-discipline or Agility (which attribute is effective will depend on weapon type) may receive an additional OB.

Expertise: A combatant especially expert with a particular weapon will receive an additional OB. In **Space Master** this is based on his/her/its skill rank. (See Future Law)

Experience: A combatant with a certain level of overall experience may be given an additional OB.

Position: A combatant in a position judged by the GM to be in some way superior to his opponent's may be given an add to his OB.

Offensive Penalties: Certain variable occurrences can decrease an attacker's OB, such as encumbering armor, wounds, lighting, etc.

5.33 OFFENSIVE BONUSES AND PENALTIES CHART	
Flank Attack	+15 *
Rear Attack	+20 *
Surprise	+20
Stunned Foe	+20 @ *
Downed Foe (foe on knees)	+30 @ *
Prone Foe	+50 @ *
Wounded more than 25% (concussion hits)	-10
Wounded more than 50% (concussion hits)	-10
Wounded more than 75% (concussion hits)	-10
Armor (see Armor Penalty table)	-(Varies)
Moving (% of possible movement equals subtraction)	-(Varies)
Drawing Weapon	-20
Changing Weapon	-50
Miscellaneous (determined by GM)	Varies

* Only applies to melee or point-blank projectile fire.
 @ Non-cumulative with each other

SHIELD CHART				
		Defensive Bonus Versus		
Shield Type	Energy	Projectile	Missile	Melee
Velocity*	+0	+60	+45	+30
Deflector	+60	+40	+15	+5
Absorption	+30	+30	+30	+30
Barrier	+90	+70	+70	+60

*The velocity shield is also available with a collector. See section 3.115 for a detailed description.

5.4 RESOLUTION OF COMBAT

A melee swing or fire attack is resolved by cross-indexing the net combat roll with the target's armor type on the correct combat table for the weapon being used. The effects of *Failures* and *Critical Strikes* are found on the correct *Failure/Fumble* table or *Critical Strike* table. In each fire phase, all attacks are treated as simultaneous. For melee, first determine the order in which the combatants will swing, and then resolve each attack in sequence, implementing the results immediately.

5.41 FIRST SWING DETERMINATION

The more quick combatant normally swings first in a melee, but this may be modified based on a number of factors, including weapon size, weight, etc.

5.42 ATTACK RESOLUTION

The net combat roll representing the swing/fire is the combat roll plus the Attacker's OB minus the Defender's DB. This number is cross-indexed with the Defender's armor type (AT) on the combat table corresponding to the Attacker's weapon to arrive at the result of the swing/fire. In certain cases where an attack is especially bad or good, another roll may be required to determine the results of a Failure or Critical Strike.

The Combat Roll: A swing/fire is represented by rolling percentile dice. The number result is the combat roll for the attack.

Failure: Each weapon has a failure range. An *unmodified* combat roll in this range results in the attack having no effect. Instead another process is necessary. In **Space Master** refer to the bottom of the chart for specific information. In the case of Energy and Projectile weapons, a 1D10 (roll one percentile die to attain a 1-10 — '0' indicating '10' in this case) roll is required to determine if there has been a weapon failure (such a malfunction, jam, or dead power cell) or if the character has actually fumbled his weapon. If there has been a weapon failure, apply the result indicated on the attack chart. If the 1D10 roll indicates a *Fumble*, the player must roll again on the appropriate Fumble chart.

Over One-Hundred Roll: The combat roll is open-ended, providing the possibility for any combatant to hit any given opponent — no matter what the respective offensive and defensive bonuses are. If the *unmodified* combat roll is between 96 and 100 inclusive, the dice are rolled again and the second roll is added to the first. The dice rolls can continue to be made and summed ad infinitum, until a roll is made that is less than 96. This stops the process and the total at this point is the relevant combat roll.

Result Determination: The net combat roll is determined by adding the OB to and subtracting the defender's DB from the (non-failure) combat roll. The net combat roll is then cross-indexed with the defender's armor type on the table corresponding to the weapon used by the attacker. Note that on all of the Personal weapon combat tables in **Tech Law** there are intermediate thresholds below the theoretical "max-out" of the chart. These thresholds are indicated by dotted lines and a phrase such as **Maximum for Mk. 1 weapons**. This refers to a specific reference on the Master Weapons Chart (section 5.6) the "Table Used" column. This not only indicates which table to use, but the relative power of that weapon on the table, designated by a Mark number (Mk.). No matter what the bonus or roll, a weapon's attack roll cannot go above the designated threshold, instead the maximum allowed result is used.

EXAMPLE: Ryk makes a net roll of 87 and has an OB of 100 with his blaster pistol. His target has a DB of 30, so his total roll is 157. However, on the Blaster chart, the pistol threshold occurs at 105. Therefore, that is the level at which the roll is cross-indexed against the target AT.

A typical result will have two components, as indicated below:

17 B

The first component will be a number from 0 on up, which is the number of concussion hits delivered to the target. The second component is a letter describing the severity of a critical strike (if any — no letter indicates that no critical strike was delivered). The type of critical normally given is noted on the chart itself, for instance Blaster normally gives an **Impact** critical. "Normally" is defined as the range of critical severity A through E: the headings on the Critical charts themselves. However, more powerful weapons can deliver multiple criticals. These are indicated by letters F through I, and the breakdown is shown on a small table at the bottom of the attack chart. Only one critical roll is made, even though two or more criticals might be indicated. This same roll is cross-indexed to the appropriate severity column on the designated columns.

The Automatic Weapon Table: This is a very special table, needed to reflect the unusual nature of a weapon which fires bursts of ammunition capable of hitting several targets. Looking at the table (5.74) one can see that it has thresholds similar to the other tables, but these serve another purpose. The Mk. number of an automatic weapon on burst does not indicate a threshold, but rather a bonus to be added to the weapon: +5 for each Mk. # (an Mk. 1 weapon would be +5, an Mk. 2 +10, etc.). The thresholds here are max-

imums to be delivered against a given number of individuals (if attempting to hit more than one). Several factors must be kept in mind when using the table, as noted below:

- 1) Number of targets: No more than five potential targets are allowed per burst, and all must be within a 60° arc of the attacker. If more than one person is designated as target, the attacker's Offensive Skill Bonus is *halved*. The skill bonus is the same whether he is attempting to hit 2 or 5 targets. However, the weapon uses a lower maximum threshold the more targets the user is trying to hit.
- 2) Mk. Number of Weapon: as stated above, the Mk. indicates a bonus: +5 for every Mk. number.
- 3) All criticals are *Puncture* below 135. However, when the total roll exceeds 135 (this can only happen when attacking one target) the *Automatic/Shrapnel* Critical table (5.85) is used against the target.

When attempting to hit more than one target, separate attacks and critical resolutions (if any) are rolled against each target.

Concussion Hits: Each combatant is limited in the number of concussion hits that he can take. When the limit is passed, the combatant is rendered unconscious and can take no further action until he is once again under the limit. Death may be caused if this limit is exceeded by a certain amount. The point at which death occurs is proportional to the combatant's physical condition (determined by Constitution in **Space Master** — see **Future Law**, section 10).

Critical Strike Types: A critical strike can be one of 5 types: Puncture, Slash, Unbalance, Heat, or Automatic/Shrapnel. See tables 5.81-85 **Critical Strike Severity:** The severity of critical strikes ranges from A (least severe) to E (most severe) with letters F through I indicating multiple criticals, detailed on the individual attack tables. When a critical strike is indicated on the net combat roll, a second roll (always 1-100) is made and the resulting number is cross-indexed with the severity of the strike (A, B, C, D, or E).

Any additional concussion hits indicated are immediately applied, as well as any other effects.

Critical Strike Interpretations: Most of the critical strike results are self-explanatory. However, certain results may have to be modified due to circumstance (i.e., a defender behind a low wall hit by a laser receiving a critical strike calling for damage to his ankle should, instead, indicate a hit to the wrist). Similarly, if a critical strike calling for an unspecified limb to be broken or otherwise damaged is rolled, then the limb affected should be determined randomly (unless the GM determines that certain limbs are much more likely to have been hit). A stunned combatant may parry to his front at half his normal ability (unless *no parry* is indicated), but may not attack or change facing.

NOTES:

1. All damages (including hits) unless otherwise indicated, are only applicable to the target combatant.
2. Bleeding indicated on the Critical strike tables is reflected in the form of additional concussion hits. This is meant to show the gradual weakening brought on by blood loss.
3. "Next swing" can refer to a fire attack as well as a melee attack.

5.5 MANEUVERING, ORIENTATION, AND MOVEMENT

Problems can arise during combat situations when combatants attempt unusual or difficult maneuvers, and when two or more combatants come into conflict while moving. The guidelines for maneuvering, orientation, and moving provide a method for resolving these conflicts.

5.51 MANEUVER RESOLUTION

When a combatant indicates an attempted maneuver, the GM should assign a *degree of difficulty* to the maneuver. The degree of difficulty is chosen from those listed across the top of the Personal Maneuver Table (5.92). The combatant then makes a maneuver roll. After the maneuver roll is modified by bonuses and penalties, the net maneuver roll is cross-indexed with the degree of difficulty of the table to obtain the result. It is important to remember that certain maneuvers may be deemed impossible by the GM. The player should be advised that such a maneuver is doomed to failure.

Maneuver Roll: The outcome of an attempted maneuver is resolved by rolling percentile dice. The number result is the maneuver roll, which is open-ended both upwards and downwards.

01-05 Roll: An unmodified dice roll between 01 and 05 inclusive indicates exceptional clumsiness. The dice are rolled again and subtracted from the first roll. If the second roll is between 96 and 100 inclusive, then a third roll is made and also subtracted, and so on. The sum of these rolls (often a negative number) is the maneuver roll.

96-100 Roll: A dice roll between 96 and 100 inclusive indicates exceptional agility. The dice are rolled again, and the result added to the first roll. If the second roll is between 96 and 100 inclusive, then a third roll is made and also added, and so on. The sum of these rolls is the maneuver roll.

Note that open-ended rolls can only continue in one direction once that direction has been established by the initial roll; they cannot see-saw up and down.

Maneuver bonuses and Penalties: Attempted maneuvers can be affected by various factors such as skills, armor and special equipment. Bonuses and penalties for these factors are outlined in table 5.93. The sum of these bonuses and penalties is added to the maneuver roll to determine the net maneuver roll.

Maneuver Results: Most results are self-explanatory, but a percentage result can be interpreted in several ways by the GM. In the case of an all-or-nothing maneuver (i.e., no partial success) a second dice roll must be made. If this second roll is equal to or less than the original percentage result, then the maneuver succeeds. Otherwise, the maneuver fails. If a maneuver can be partially successful, then the original percentage result is the degree of success.

5.52 ORIENTATION ROLL

When required by the GM, combatants must make an orientation roll to determine their degree of self-control and awareness. The GM must determine the difficulty of the orientation, then the combatant makes the orientation roll in the same manner as a maneuver. Failure means disorientation and no further action is allowed for that round. Success means that the combatant is under control and aware of the situation, and may take further action that he would normally be allowed.

5.53 MOVEMENT CONFLICTS

When two or more combatants attempt to perform conflicting movements, the GM may choose to resolve the conflict by having the combatants in question make maneuver rolls. If both the maneuvers are successful, then the conflict is considered a draw, and movement for the involved parties terminates at the point of conflict. In these cases of conflicting movement, the GM will have to ultimately decide himself the outcome of the conflict. The maneuver rolls of the involved parties are intended to aid him in his decision.

5.6 MASTER WEAPONS CHART

				Range (meters)				Range Mod					Armor Type Modifier						
Name of Weapon	Type	Rate	F	PB	SR	MR	LR	PB	SR	MR	LR	Table Used	20-17	16-13	12-9	8-5	4-1	Special	
7mm Automatic	1h proj	2/rnd	3	1	10	20	50	0	0	-10	-95	SmPrj Mk. 1	-5	0	0	0	0	Clip of 10 rnds.	
11mm Automatic	1h proj	2/rnd	3	2	15	30	80	+10	+5	-10	-85	SmPrj Mk. 2	0	0	0	+5	+10	Clip of 8 rnds.	
5mm Body Pistol	1h proj	2/rnd	3	1	10	15	50	+5	0	-20	-90	SmPrj Mk. 1	-5	-5	0	0	0	Clip of 5 rnds.	
10mm MLA Pistol	1h proj	2/rnd	6	1	100	200	450	+5	0	-10	-90	SmPrj Mk. 5	0	0	0	0	0	Clip of 4 rnds.	
3mm Needle Pistol	1h proj	2 burst	5	1	10	20	30	0	-5	-10	-50	SmPrj Mk. 2	-15	-10	-5	0	+10	6 bursts	
5mm Rifle	2h proj	1/rnd	3	5	100	200	450	0	-5	-20	-80	SmPrj Mk. 1	-25	-15	-5	0	0	Bolt/clip 5 rds.	
10mm Heavy Rifle	2h proj	2/rnd	3	10	125	300	600	+10	0	-10	-70	SmPrj Mk. 4	0	0	0	0	0	Clip of 10 rnds.	
Lt Assault Rifle	2h proj	2 burst	5	10	60	120	300	+5	0	-40	-90	Auto Mk. 3	0	0	0	+5	+5	3 Bursts	
		2/rnd	3	10	100	200	500	+5	0	-10	-70	SmPrj Mk. 3						Clip of 15 rds.	
7mm Rocket Rifle	2h proj	2 burst	7	10	80	150	350	-30	0	-10	-60	Auto Mk. 3	+5	+5	+5	0	0	3 Bursts	
		2/rnd	6	10	100	300	900	-30	0	-10	-60	SmPrj Mk. 3						Clip of 15 rnds.	
9mm SMG (uzi)	2h proj	2 burst	4	1	10	50	80	+15	0	-15	-80	Auto Mk. 2	-10	-10	-5	-5	-5	3 Bursts	
15mm MLA Rifle	2h proj	2/rnd	6	3	150	300	1000	+10	0	-5	-30	SmPrj Mk. 5	0	+5	+5	+5	+5	Clip of 8 rnds.	
3mm Tangle Rifle	2h proj	1/rnd	5	1	10	20	30	+10	0	-5	-50	Envelop	+10	+5	0	0	0	Max Lg Atk/1rnd (Claw Law)	
15mm Shotgun	2h proj	2/rnd	5	3	25	40	60	+5	0	-20	-90	SmPrj Mk. 3	+5	+5	+10	+10	+10	5 shots P & Im	
15mm Flechette	2h proj	2/rnd	5	3	25	40	60	+10	0	-20	-90	SmPrj Mk. 3	-5	0	0	+10	+15	5 shots S & P	
20mm Autoshotgun	2h proj	2 burst	5	4	25	50	75	+10	0	-20	-90	Auto Mk. 4	0	0	0	+5	+5	2 Bursts	
9mm LMG	Support proj	2 burst	5	5	150	300	600	+10	0	-10	-70	Auto Mk. 5	0	0	0	0	0	Drum: 10 bursts	
12mm HMG	Support proj	2 burst	5	10	200	500	1000	+10	0	-5	-70	Auto Mk. 5	0	0	0	0	0	Belt: 30 bursts	
																		Belt: 30 bursts	
Hand Laser	1h engy	2/rnd	5	.5	10	20	30	0	-10	-30	-70	Laser Mk. 1	0	0	0	0	0	Concealable	
Laser Pistol	1h engy	2/rnd	4	1	50	100	200	+10	0	-15	-90	Laser Mk. 2	0	0	0	0	0	*	
Laser Rifle	2h engy	2/rnd	4	1	50	200	400	+15	0	-10	-80	Laser Mk. 3	0	0	0	0	0	*	
Med Laser	Port. E	2/rnd	5	3	100	300	700	+15	0	-10	-90	Laser Mk. 4	0	0	0	0	0	*	
Heavy Laser	Port. E	2/rnd	5	3	300	1000	2000	0	0	-10	-90	Laser Mk. 5	0	0	0	0	0	*	
Blast Pistol	1h engy	2/rnd	5	1	50	150	400	+5	0	-15	-90	Blast Mk. 2	0	0	0	0	0	*	
Assault Blaster	2h engy	2/rnd	5	1	100	200	500	+5	0	-20	-90	Blast Mk. 3	0	0	0	0	0	*Use 1h at -20	
Blaster Rifle	2h engy	2/rnd	4	1	100	250	500	+5	0	-20	-90	Blast Mk. 4	-10	-10	0	0	0	*	
Med Blaster	Port. E	2/rnd	4	3	150	300	700	+5	0	-20	-90	Blast Mk. 4	0	0	+5	+5	+10	*	
	2h engy	1/rnd	5					+5	-5	-25	-95	Blast Mk. 4	0	0	0	0	0	*	
Heavy Blaster	Port. E	2/rnd	4	10	300	600	1000	+5	0	-30	-90	Blast Mk. 5	0	0	0	0	0	*	
Hand Stunner	1h engy	2/rnd	4	1	5	10	15	+5	0	-10	-20	Stun Mk. 1	0	0	0	0	0	*Concealable	
Stun Pistol	1h engy	2/rnd	3	1	10	20	50	+10	0	-10	-30	Stun Mk. 2	0	0	0	0	0	*	
Stun Rifle	2h engy	2/rnd	4	1	20	50	100	+10	0	-10	-30	Stun Mk. 3	0	0	0	0	0	*	
Plasma Rep. Rifle	2h engy	2 burst	8	2	30	100	200	+10	0	-20	-90	Auto Mk. 5	0	0	+5	+5	+10	Heat/Rad Critical	
	2h engy	2/rnd		3	40	150	300	+5	0	-15	-80	Blast Mk. 5						Heat/Rad/Imp crit	
Flame Pistol	1h engy	2/rnd	9	5	10	20	30	+5	0	-10	-30	Fire Bolt x2	0	0	0	0	0	(Spell Law)	
Flame Rifle	2h engy	2/rnd	9	5	20	30	50	+5	0	-15	-40	Fire Bolt x4	0	0	0	0	0	(Spell Law)	

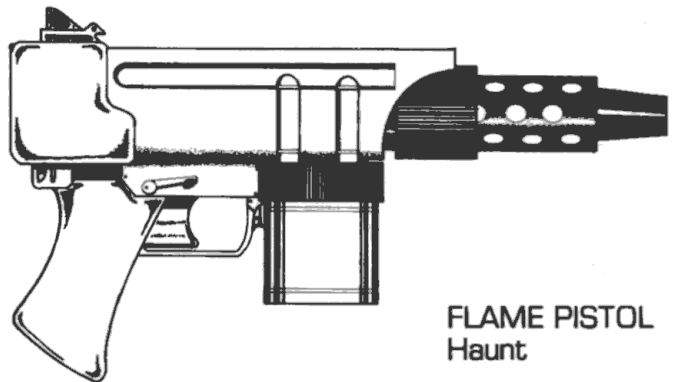
Key:

F Failure %
PB Point Blank
SR Short Range
MR Medium Range
LR Long Range

* NOTE: There is no set charge in energy weapons power prices; when a "Failure" is rolled there is a subsequent chance that a "Power Pack Depleted" result will be attained. This is the only time (in normal use) that energy weapons power packs are depleted.



ASSAULT STUNNER
Kashmere Tools

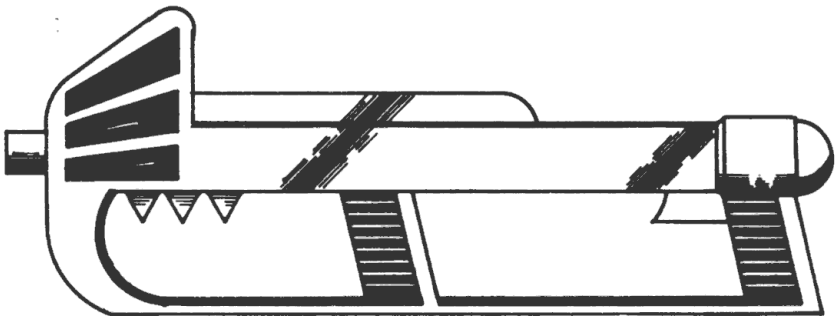


FLAME PISTOL
Haunt

Attack Chart for: Blaster																				
All Criticals A-E are IMPACT; see below for combinations																				
	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
01-0X	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
0X-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31-33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34-36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3A	3A	0	0	0	0
37-39	1	0	0	0	0	0	0	0	0	0	0	0	0	2	3A	3A	0	0	4	0
40-42	1	1	1	0	0	0	0	0	0	0	0	0	0	2	4A	4A	0	0	4	0
43-45	1	1	1	1	0	0	0	0	0	0	0	0	2	3	4A	4A	0	0	5A	0
46-48	2	1	2	1	1	0	0	0	0	0	0	0	2	3A	5A	5A	0	0	5A	0
49-51	2	2	2	2	1	1	0	0	0	0	0	0	3	4A	5A	5A	0	1	6A	4
52-54	2	2	3	2	1	1	1	0	0	0	0	2	3A	4A	6A	6A	0	1	6A	4
55-57	3	2	3	3	2	2	1	1	0	0	1	2	4A	5A	6A	6A	1	2	7A	5A
58-60	3	3	3	3	2	2	2	1	0	1	1	3	4A	5A	7A	7A	1	2	7A	5A
61-63	3	3	4	4	3	3	2	2	1	1	2	3A	5A	6A	8A	8A	2	3A	8B	6A
64-66	4	3	4	4	3	3	3	2	1	2	2	4A	5A	6A	8A	8B	2	3A	9B	6A
67-69	4	4	4	5	4	4	3	3	2	2	3	4A	6A	7A	9B	9B	3	4A	10B	7A
70-72	4	4	5	5	4	4	4	3	2	3	3	5A	6A	7B	9B	9B	4A	5A	11B	7B
73-75	5	5	5	6	5	5	4	4A	3	3	4	6A	7A	8B	10B	10B	5A	6A	12B	8B
76-78	5	5	6	6	5	5	5	5A	3	4	5	7A	7B	8B	10B	10B	5A	7A	13C	8B
79-81	6	6	6	7	6	6	6	6A	4	5	6	8A	8B	9B	11B	11B	6A	8A	14C	9B
82-84	6	7	7	8	6	7	7	7A	4	5	7A	9B	8B	9B	11B	12B	6A	8A	15C	9C
85-87	7	7	8	8	7	7	8A	7A	5	6	8A	10B	9B	10B	12B	10B	7A	9A	16C	10C
88-90	7	8	9	9A	8	8A	8A	8A	6	7A	9A	11B	10B	10B	13B	11B	8A	9B	17D	10C
MAXIMUM RESULT FOR MARK I WEAPON																				
91-93	8	8	10	10A	9	8A	9A	9A	7A	8A	10A	12B	11B	11C	14B	12C	9A	10B	18D	11C
94-96	8	9	11A	11A	10A	9A	10A	11B	8A	9A	11A	13B	12B	13C	15C	14C	10B	11B	20D	13D
97-99	9	10A	12A	13A	12A	10A	11A	13B	9A	10A	12A	14B	13B	14C	16C	16C	11B	13B	21D	15D
100-102	9A	11A	13A	14A	13A	11A	12A	14B	10A	11A	13B	15B	14B	15C	17C	17C	12B	14B	23E	17D
103-105	10A	12A	14A	15A	14A	12B	14B	16B	11A	12B	14B	16B	15C	16C	18C	18C	13B	15C	24E	19D
MAXIMUM RESULT FOR MARK II WEAPON (PISTOL)																				
106-108	10A	13A	15A	17B	18A	13B	16B	18B	12A	13B	16B	17C	16C	17D	19C	20C	14B	16C	26E	21E
109-111	11A	14A	16B	18B	19A	15B	18B	20C	13A	14B	18B	18C	17C	19D	20C	22C	15C	18C	27E	23E
112-114	11A	14B	17B	20B	21B	17B	20C	22C	14B	15B	20C	19C	19C	21D	21C	24C	16C	19C	29F	25E
115-117	12B	15B	18B	21B	22B	19C	22C	24C	15B	17B	22C	20C	21C	23D	22C	26D	17C	20C	30F	27E
118-120	12B	16B	19B	23C	24B	21C	24C	26D	16B	18C	24C	22C	23D	25D	24D	28D	18C	21D	32F	29F
MAXIMUM RESULT FOR MARK III WEAPON (ASSAULT)																				
121-123	13B	17B	20B	24C	25C	23C	26C	28D	18B	20C	26C	24D	25D	27D	26D	30D	19C	23D	34F	31F
124-126	13B	17B	21C	26C	27C	25C	28D	30D	19C	21C	28D	26D	27D	29E	28D	32D	20D	25D	37G	34F
127-129	14B	18C	22C	27C	28C	27D	30D	32D	20C	23C	30D	28D	29D	31E	30D	34D	22D	27D	40G	37F
130-132	14C	19C	23C	29D	30C	29D	32D	34E	22C	24D	32D	30D	31E	34E	33D	36E	24D	29D	43G	40G
133-135	15C	20C	24D	30D	31D	31D	34E	36E	23C	26D	34E	32E	33E	37E	36E	39E	26D	31E	46H	43G
MAXIMUM RESULT FOR MARK IV WEAPON (RIFLE)																				
136-138	15D	21D	25D	32D	33D	33E	36E	38E	25D	28D	37E	35E	36E	40E	39E	42E	29D	34E	49H	47G
139-141	16D	22D	26E	33E	34E	35E	38E	40F	27D	30D	40E	38E	39E	43E	42E	45E	32E	37E	51H	51G
142-144	17D	23E	27E	35E	36E	37E	40F	42F	29D	32E	43E	41E	42F	46F	46F	48F	35E	40E	54H	55H
145-147	18E	24E	28E	36E	37E	39E	42F	44F	31E	34E	46F	44F	45F	49F	50F	51F	38E	43F	57H	59H
148-150	19E	25E	29F	38F	39F	41F	44F	46F	33E	36E	49F	47F	48F	52G	54G	55G	41E	46F	60H	63H
MAXIMUM RESULT FOR MARK V WEAPON (HEAVY RIFLE)																				
	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

Consult master weapons chart for actual failure range of hand weapon. If a failure is rolled, roll 1D10: 01-06: charge depleted; 07-09: weapon malfunction; UM 10 fumble weapon (roll on hand weapon fumble chart).

Extended Criticals: F = E impact and A heat
G = E impact and B heat
H = E impact and C heat.

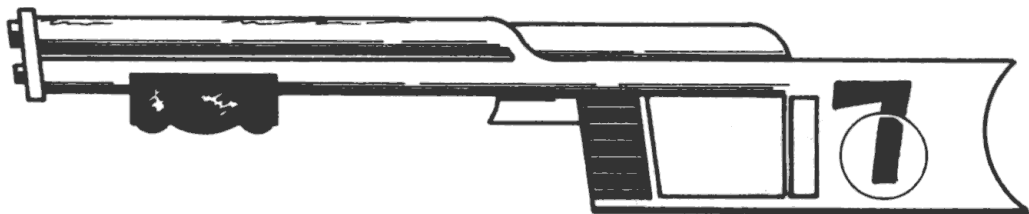


ASSAULT BLASTER

Attack Chart for: Stunner																					
All criticals are UNBALANCE																					
	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
01-0X	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	01-0X
0X-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0X-30
31-33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	31-33
34-36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	34-36
37-39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	37-39
40-42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	40-42
43-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	43-45
46-48	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	3	3	46-48
49-51	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	4	3	49-51
52-54	0	0	0	0	0	0	0	0	0	0	0	1	1	2	1	2	0	1	5	4	52-54
55-57	0	0	0	0	0	0	0	1	0	0	1	1	2	2	2	2	1	2	6	4	55-57
58-60	0	0	0	0	0	1	1	1	0	0	1	2	2	3	2	2	1	2	7	5	58-60
61-63	0	0	0	1	1	1	1	2	0	0	2	2	3	3	3	3	2	3	8	5	61-63
64-66	0	0	0	1	1	2	2	2	0	0	2	3	3	4	3	3	2	3	9A	6	64-66
67-69	0	1	1	2	2	2	2	3	0	0	3	3	4	4	4	4	3	4	10A	6	67-69
70-72	1	1	1	2	2	3	3	3	0	1	3	4	4	5	4	4	4	5	11A	7A	70-72
73-75	1	2	2	3	3	3	3	4	1	1	4	5	5	5	5	5A	5	6	12A	7A	73-75
76-78	1	2	2	3	3	4	4	5	1	1	4	6	5	6	6	6A	5	7	13A	8A	76-78
79-81	2	3	3	4	4	4	4	6	1	2	5	7A	6	6	7	7A	6	8	14A	8A	79-81
82-84	2	3	3	4	4	5	5	7	2	2	6	8A	6	7	8A	9A	6	8	15B	9A	82-84
85-87	2	4	4	5	5	5	5	7	2	2	7	9A	7	7	9A	10A	7	9	16B	9A	85-87
88-90	3	4	4	5	5	6	6	8	2	3	8	10A	7	8	10A	11B	7	9A	17B	10B	88-90
MAXIMUM RESULT FOR MARK I WEAPON (HAND)																					
91-93	3	5	5	6	6	7	9	8	3	3	9	11A	8	9A	11A	12B	8A	10A	18B	11B	91-93
94-96	3	5	5	6	6	8	10	9	3	4	10A	12B	8	9A	12A	13B	8A	11A	20B	13B	94-96
97-99	4	6	6	7	7	9	11	9	3	4	11A	13B	9	10A	13B	14B	9A	12A	21B	15B	97-99
100-102	4	6	6	7	7	10	12	10	4	5	12A	14B	10	10A	14B	15B	10A	13A	23C	17B	100-102
103-105	5	7	7	8	8	11	13	11	4	5	13A	15B	11A	11B	15B	16B	11A	14B	24C	19C	103-105
MAXIMUM RESULT FOR MARK II WEAPON (PISTOL)																					
106-108	5	7	7	8	9	12	14	12	4	6	14A	16B	12A	12B	16B	18C	12A	15B	26C	21C	106-108
109-111	6	8	8	9	10	13	15	13	5	6	15B	17C	13A	13B	17B	19C	13B	16B	27C	23C	109-111
112-114	6	8	8	10	11	14	16	14A	5	7	16B	18C	14A	14B	18C	20C	14B	17B	29D	25C	112-114
115-117	7	9	9	11	12	15	17A	15A	5	7A	17B	19C	15B	15C	19C	22C	15B	18B	30D	27C	115-117
118-120	7	9	10	12A	13	16A	18A	16B	6A	8A	18B	20C	16B	16C	20C	23C	16B	19C	32D	29D	118-120
MAXIMUM RESULT FOR MARK III WEAPON (ASSAULT)																					
121-123	8	10	11	13A	14A	17A	19A	17B	6A	8A	19B	21C	17B	17C	21C	24D	17B	20C	34D	31D	121-123
124-126	9	11A	12A	14A	15A	18A	20B	18B	7A	9A	20C	22C	18C	18C	22D	26D	18C	21C	36D	33D	124-126
127-129	10A	12A	13A	15B	16A	19B	21B	19B	7B	9B	22C	23D	19C	19D	23D	27D	19C	22C	38E	35D	127-129
130-132	11A	13A	14A	16B	17B	20B	22B	20C	8B	10B	23C	24D	20C	20D	24D	28D	20C	23D	40E	37E	130-132
133-135	12A	14B	15B	17B	18B	21B	23C	21C	8C	11B	25D	25D	21C	22D	25D	30E	21C	24D	42E	39E	133-135
MAXIMUM RESULT FOR MARK IV WEAPON (RIFLE)																					
136-138	13A	15B	16B	18C	19C	22C	24C	22D	9C	12C	26D	27D	22D	23D	26D	31E	22D	25D	44E	41E	136-138
139-141	14B	16B	17B	19D	21C	23C	25D	24D	9D	13C	28D	28E	23D	25E	27E	32E	23D	26D	46E	43E	139-141
142-144	15B	17C	18C	20D	23D	24D	26D	26E	10D	14D	29E	30E	24D	26E	28E	34E	24D	27E	48E	45E	142-144
145-147	16B	18C	19C	22D	25D	25D	27D	28E	11D	15D	31E	31E	25E	28E	29E	35E	25E	28E	50E	48E	145-147
148-150	17C	19C	20D	24E	27E	26E	28E	30E	12E	16E	33E	33E	26E	29E	30E	36E	26E	29E	53E	52E	148-150
MAXIMUM RESULT FOR MARK V WEAPON (HEAVY RIFLE)																					
	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	

Consult master weapons chart for actual failure of hand weapon. If a failure is rolled, roll 1 D10: UM 01-06 charge depleted; UM 07-09 weapon malfunction; UM 10 fumble weapon, roll on the Fumble table.

Consult master weapons chart for actual failure of hand weapon. If a failure is rolled, roll 1 D10: UM 01-06 charge depleted; UM 07-09 weapon malfunction; UM 10 fumble weapon, roll on the Fumble table.



STUNNER RIFLE



STUNNER PISTOL

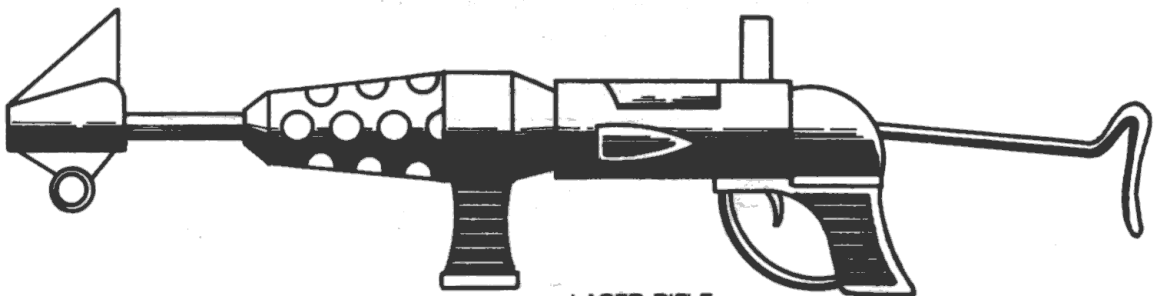
Attack Chart for: Hand Laser

All criticals A-E are HEAT; see below for combinations

	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
01-0X	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	01-0X
0X-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0X-30
31-33	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31-33
34-36	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34-36
37-39	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37-39
40-42	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40-42
43-45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43-45
46-48	2	1	0	0	2	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	46-48
49-51	2	1	0	0	2	1	0	0	0	0	0	0	0	0	3	4A	0	0	0	0	49-51
52-54	2	1	0	0	2	1	0	0	0	0	0	0	0	3	3A	4A	0	0	0	0	52-54
55-57	2	1	1	0	3	1	0	0	0	0	0	0	0	4	4A	5A	0	0	0	0	55-57
58-60	2	2	1	0	3	2	0	0	0	0	0	0	0	4A	4A	5A	0	0	3A	0	58-60
61-63	3	2	1	0	3	2	1	0	0	0	0	0	4	5A	5A	6A	0	0	3A	0	61-63
64-66	3	2	1	0	4	2	1	0	0	0	0	0	4A	5A	5A	6A	0	0	4A	3A	64-66
67-69	3	2	2	1	4	3	1	0	0	0	0	0	5A	6A	6A	7A	0	0	4A	3A	67-69
70-72	3	3	2	1	4	3	2	1	0	0	0	3	5A	6A	6A	7B	0	1	5B	3A	70-72
73-75	3	3	2	1	5	3	2	1A	0	0	3	3A	6A	7A	7B	8B	0	1	5B	4A	73-75
76-78	4	3	2	2	5	4	2	1A	0	0	3A	4A	6A	7B	7B	8B	0	2	6B	4B	76-78
79-81	4	3	3	2	5	4	3A	2A	0	0	4A	4A	7B	8B	8B	9B	1	2	6B	5B	79-81
82-84	4	4	3	2	6	4	3A	2A	0	0	4A	5A	7B	8B	8B	10B	2	3	7C	5B	82-84
85-87	4	4	3	3	6	5	3A	3A	0	0	5A	5A	8B	9C	9B	10B	2	3A	8C	6B	85-87
88-90	4	4	3	3	6	5A	4A	3B	0	0	6A	6B	8C	9C	9B	11C	3A	4A	8C	7C	88-90
MAXIMUM RESULT FOR MARK I WEAPON																					
91-93	5	5	4	3A	7	6A	4A	4B	0	4	6A	6B	9C	10C	10C	11C	3A	5A	9C	7C	91-93
94-96	5	5	4	4A	7A	6A	5B	4B	3	4	7B	7B	9C	10C	10C	12C	4A	6A	10D	8C	94-96
97-99	5	5	5A	4A	8A	7B	6B	5B	3	4A	7B	8B	10D	11C	11C	13C	5A	7A	10D	9D	97-99
100-102	6A	6A	5A	5B	8A	7B	7B	6B	4	5A	8B	9C	10D	12C	11C	13D	6A	8B	11D	10D	100-102
103-105	6A	6A	6A	5B	9B	8B	8C	7C	4A	5A	9C	10C	11D	12D	12D	14D	7A	9B	12E	10D	103-105
MAXIMUM RESULT FOR MARK II WEAPON																					
106-108	6A	7A	6A	6B	9B	8C	9C	8C	5A	6B	10C	11C	11D	13D	13D	15D	8B	10B	12E	11D	106-108
109-111	7A	7A	7B	7C	10B	9C	10C	9C	5A	6B	11C	12D	12E	13D	14D	15E	9B	11B	13E	12E	109-111
112-114	7A	8B	8B	8C	10C	10C	11C	10C	6B	7B	12D	13D	12E	14E	15E	16E	10B	12C	14F	13E	112-114
115-117	7A	8B	9B	9C	11C	10D	12D	11D	6B	7C	13D	14D	13E	14E	16E	17E	11B	13C	15F	14E	115-117
118-120	8B	9B	10C	10D	12C	11D	13D	12D	7B	8C	14D	15E	13E	15E	17E	18F	12C	14C	16F	15E	118-120
MAXIMUM RESULT FOR MARK III WEAPON																					
121-123	8B	9B	11C	11D	13D	12D	14D	13D	7C	8C	15E	16E	14E	15F	18F	19F	13C	15D	17G	17F	121-123
124-126	8B	10C	12C	12D	14D	13E	15D	14D	8C	9D	16E	17E	15F	16F	19F	20F	14C	16D	18G	19F	124-126
127-129	9B	10C	13D	13D	15D	14E	16E	15E	8C	9D	17E	18F	16F	16F	20F	21F	15C	17D	19G	21F	127-129
130-132	9C	11C	14D	14E	16E	15E	17E	16E	9D	10D	18F	19F	17F	17F	21F	22G	16D	18E	20G	23F	130-132
133-135	10C	12D	15D	15E	17E	16E	18E	18E	9D	11E	20F	20F	18F	18G	22G	23G	17D	19E	22H	25G	133-135
MAXIMUM RESULT FOR MARK IV WEAPON																					
136-138	11C	13D	16E	16E	18E	17E	19E	20E	10D	12E	22F	21G	19G	19G	23G	24G	18D	20E	24H	28G	136-138
139-141	12D	14E	17E	17E	19E	18F	20F	22F	11E	13E	24G	22G	20G	20G	24G	25H	19E	22F	26H	31G	139-141
142-144	13D	15E	18E	18F	20F	20F	22F	24F	12E	14F	26G	24G	22G	21G	26H	27H	20E	24F	28H	34H	142-144
145-147	14D	16E	19F	19F	21F	22F	24F	26F	13E	15F	28G	26G	24G	22H	28H	29H	22F	26F	31H	38H	145-147
148-150	15E	17F	20F	20F	22F	24G	26G	28F	14F	16F	30G	28G	26H	23H	30H	32H	24G	28G	35H	42H	148-150
MAXIMUM RESULT FOR MARK V WEAPON																					
	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	

Consult master weapons chart for actual failure range of hand weapon. If a failure is rolled, roll 1D10: 01-06: charge depleted; 07-09: weapon malfunction; 10: fumble weapon, roll on hand weapon fumble chart (5.9).

Extended Criticals: F = E heat and A puncture
G = E heat and B puncture
H = E heat and C puncture



LASER RIFLE



LASER PISTOL

Attack Chart for: Automatic Handheld Projectile

Attacks against one target resulting in above 135 use the Shrapnel/Multiple strike critical table; those below use Puncture.

	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
01-0X	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	01-0X
03-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	03-30
31-33	0	0	0	0	0	0	0	0	0	0	0	0	0	10	11	12	0	0	0	0	31-33
34-36	0	0	0	0	2	0	0	0	0	0	7	8	10	11	12	13	0	0	0	0	34-36
37-39	0	0	0	0	3	0	0	0	0	0	8	9	11	12	13	14A	10	0	0	0	37-39
40-42	0	0	2	0	4	0	0	7	0	0	9	10	12	13	14A	15A	10	11	17A	0	40-42
43-45	0	0	3	0	5	0	7	8A	0	0	10	11	13	14	15A	16A	1	12	18A	16	43-45
46-48	0	2	4	4	6	7	8	9A	3	4	11	12	14	15	16A	17A	11	12A	19A	17A	46-48
49-51	2	3	5	5A	7	8A	9A	10A	4	5	12A	13A	15	16A	17A	18A	12A	13A	20A	18A	49-51
52-54	3	4	6	6A	8	9A	10A	11A	6	6A	13A	14A	16A	17A	18A	19A	12A	14A	21B	19A	52-54
55-57	4	5	6A	7A	9A	10A	11A	12A	7A	8A	14A	15A	17A	18A	19A	20A	13A	15A	22B	20B	55-57
58-60	5	6A	7A	8A	10A	11A	12A	13A	8A	9A	15A	16A	18A	19A	20A	21A	13A	16A	23B	21B	58-60
61-63	6	7A	8A	8A	10A	11A	12A	14A	9A	10A	16A	17B	19A	20A	21A	22B	14A	17A	24B	22B	61-63
64-66	7A	8A	9A	9A	11A	12A	13A	14B	10A	11A	17B	18B	20A	21A	22B	23B	15A	18B	25B	23B	64-66
67-69	8A	9A	10A	10A	12A	13A	14B	15B	11A	12A	18B	19B	21A	22B	23B	24B	16B	19B	26C	24B	67-69
70-72	9A	10A	11A	12A	13B	14B	15B	16B	12A	13B	19B	20B	22B	23B	24B	25B	17B	20B	27C	25C	70-72
73-75	10A	11A	12B	13B	14B	15B	16B	17B	13B	14B	20B	21C	23B	24B	25B	26B	18B	21B	28C	26C	73-75
76-78	11A	12B	13B	14B	15B	16B	17C	18C	14B	15B	21C	22C	24B	25B	26B	27C	19B	22C	29C	27C	76-78
79-81	12B	13B	14B	15B	16C	17C	18C	19C	15B	16B	22C	23C	25B	26B	27C	28C	20C	23C	30D	28C	79-81
82-84	13B	14B	15B	16B	17C	18C	19C	20C	16B	17C	23C	24C	26B	27C	28C	29C	21C	24C	31D	29D	82-84
85-87	14B	15C	16C	17C	18C	19C	20C	21C	22C	23C	24C	25D	27C	28C	29C	30D	22C	25C	32D	30D	85-87
88-90	15C	16C	17C	18C	19C	20C	21D	22D	23C	24C	25D	26D	28C	29C	30D	31D	23C	26D	33D	31D	88-90
MAXIMUM RESULT FOR SPRAY OF FIVE TARGETS																					
91-93	16C	17C	18C	19C	20D	21D	22D	23D	24C	25C	26D	27D	29C	30D	31D	32D	24D	27D	34E	32D	91-93
94-96	17C	18D	18D	20D	21D	22D	23D	24D	25D	26D	27D	28E	30D	31D	32D	33D	25D	28D	35E	33E	94-96
97-99	18D	19D	19D	22D	22D	23D	24D	25D	26D	27D	28D	29E	31D	32D	33D	34D	26D	29D	36E	34E	97-99
100-102	19D	20D	21D	22D	23E	24E	25E	26E	27E	28E	29E	30E	32D	33D	34D	35D	27E	30E	37F	35E	100-102
103-105	20E	21E	22E	23E	24E	25E	26E	27E	28E	29E	30E	31E	33E	34E	35E	36E	28E	31E	38F	36F	103-105
MAXIMUM RESULT FOR SPRAY OF FOUR TARGETS																					
106-108	21E	22E	23E	24E	25E	26E	27E	28E	29E	30E	31E	32E	34E	35E	36D	37E	29E	32E	39F	38F	106-108
109-111	22E	23E	24E	25E	26E	27E	28E	29E	30E	31E	32E	33F	35E	36E	37E	38E	30E	33E	41G	40F	109-111
112-114	23E	24E	25E	26E	27E	28E	29E	30E	31E	32E	33E	34F	36E	37E	38E	39F	31E	34E	43G	42G	112-114
115-117	24E	25E	26E	27E	28F	29F	30F	31F	32E	33F	34F	35G	37F	38F	39F	40F	32F	35F	45G	44G	115-117
118-120	25F	26F	27F	28F	29F	30F	31F	32F	33F	34F	35F	36G	38F	39F	40F	41F	33F	36F	47H	46G	118-120
MAXIMUM RESULT FOR SPRAY OF THREE TARGETS																					
121-123	26F	27F	28F	29F	30F	31F	32F	33F	34F	35F	36G	37G	39F	40F	41F	42F	34F	37F	49H	48H	121-123
124-126	27F	28F	29F	30F	31F	32F	33F	34F	35F	36F	37G	38G	40F	41F	42F	44G	35F	38G	51I	50H	124-126
127-129	28F	29F	30F	31F	32G	33G	34G	35G	36F	37G	39G	40H	41F	42G	43G	46G	36F	39G	53I	52I	127-129
130-132	29F	30F	31G	32G	33G	34G	35G	36G	37G	38G	40G	42H	42G	43G	44G	48G	37G	40G	55J	54I	130-132
133-135	30F	31F	32G	33G	34G	35G	36G	37G	38G	39G	41H	43H	43G	44G	45H	50H	38G	41H	57K	56I	133-135
MAXIMUM RESULT FOR SPRAY OF TWO TARGETS																					
136-138	31C	32C	33C	34D	35D	36D	37D	38D	39D	40D	42D	44D	44D	45D	46D	52D	39D	42D	59E	58E	136-138
139-141	32C	33D	35D	36D	37D	38D	39D	40D	40D	41D	44D	46D	45D	46E	48E	54E	40D	43E	61E	60E	139-141
142-144	33D	35D	37D	38D	39D	40D	41D	42D	41D	42D	46E	48E	46E	47E	50E	56E	41E	44E	63E	62E	142-144
145-148	35D	37D	39E	40E	41E	42E	43E	44E	42E	43E	48E	50E	47E	48E	52E	58E	42E	45E	65E	64E	145-147
148-150	37E	39E	41E	42E	43E	44E	45E	46E	43E	45E	50E	52E	48E	49E	54E	60E	43E	46E	67E	66E	148-150
MAXIMUM FOR SINGLE TARGET ATTACK (USE SHRAPNEL/AUTOMATIC TABLE FOR CRITICALS THIS SECTION)																					
	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	

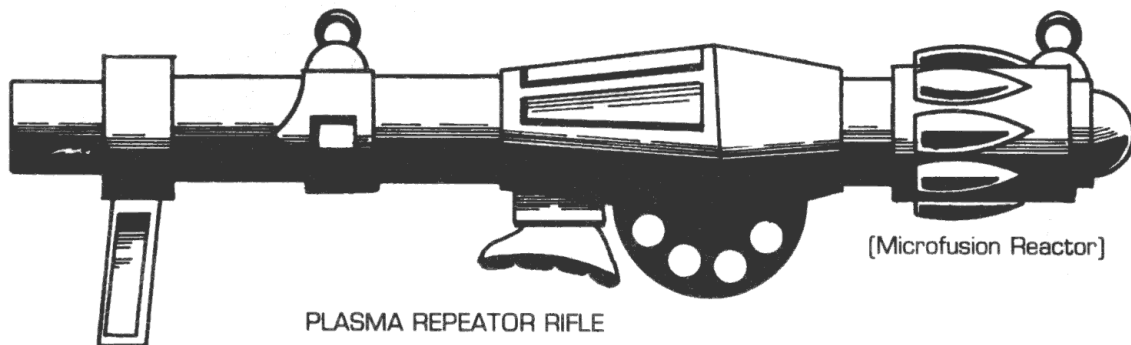
Multiple critical strikes: F = EP, AP
 G = EP, BP
 H = EP, BP, AP
 I = EP, CP, AP

Mark (Mk. #) Bonuses when using this table: Mk. 1 = +5
 Mk. 2 = +10
 Mk. 3 = +15
 Mk. 4 = +20
 Mk. 5 = +25

Consult Master weapons chart for actual fumble range of weapon. If a failure is rolled, roll 1 D10;

If projectile weapon: 01-05: ammunition jammed, weapon useless for 1-10 rnds; 06-08: weapon malfunction, roll on Malfunction/Repair chart (6.41); 09-10: Fumble weapon, roll on Fumble Chart.

If energy weapon: 01-05: charge depleted; 06-08: weapon malfunction, roll on Malfunction/Repair chart (6.41); 09-10 fumble weapon, roll on Fumble table;



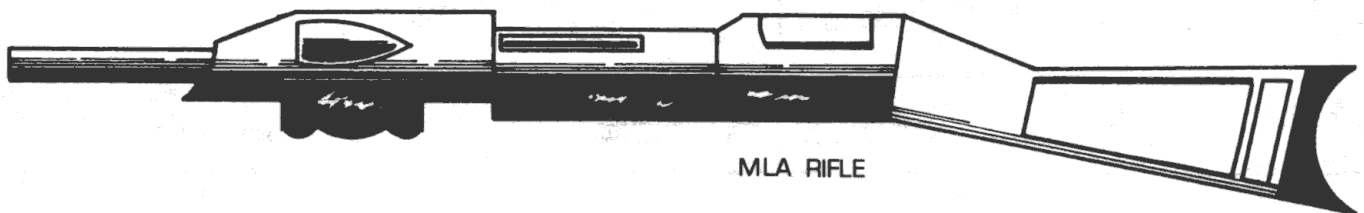
[Microfusion Reactor]

Attack Chart for: Small Projectile

All Criticals are Puncture

	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
01-0X	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	01-0X
0X-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0X-30
31-33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31-33
34-36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34-36
37-39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37-39
40-42	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40-42
43-45	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	43-45
46-48	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	46-48
49-51	3	0	0	0	2	0	0	0	0	0	0	0	0	0	3	4	0	0	0	0	49-51
52-54	3	0	0	0	2	0	0	0	0	0	0	0	0	3	3	4	0	0	0	0	52-54
55-57	3	2	0	0	3	2	0	0	0	0	0	0	0	4	4	5A	0	0	0	0	55-57
58-60	3	2	0	0	3	2	0	0	0	0	0	0	0	4	4A	5A	0	0	3A	0	58-60
61-63	4	2	2	0	3	2	0	0	0	0	0	0	4	5	5A	6A	0	0	3A	0	61-63
64-66	4	2	2	0	4	3	0	0	0	0	0	0	4	5A	5A	6A	0	0	4A	6A	64-66
67-69	4	3	2	0	4	3	2	0	0	0	0	0	5A	6A	6A	7A	0	0	4A	6A	67-69
70-72	4	3	2	0	4	3	2	3	0	0	0	3	5A	6A	6A	7B	0	0	5B	6A	70-72
73-75	4	3	3	2	5	4	3	4A	0	0	3	3A	6A	7A	7B	8B	0	0	5B	7A	73-75
76-78	5	3	3	2	5	4	4	5A	0	0	3	4A	6A	7B	8B	8B	0	0	6B	7B	76-78
79-81	5	4	3	3	5	4	5A	6A	0	0	4	4A	7B	8B	9B	9B	0	0	6B	7B	79-81
82-84	5	4	4	3A	6	5	6A	7A	0	0	4A	5A	7B	9B	10B	10B	0	3A	7C	8B	82-84
85-87	5	4	4	4A	6	5A	7A	8B	0	0	5A	5A	8B	10C	11B	10B	3	3A	8C	8B	85-87
88-90	6	4	4A	4A	6A	6A	8B	9B	3	4A	6A	6B	8C	11C	12B	11B	4A	4A	9C	8C	88-90
MAXIMUM RESULT FOR MARK I WEAPON																					
91-93	6	5	5A	5A	7A	7A	9A	10B	3A	4A	6A	6B	9C	12C	13B	11C	4A	5A	10C	8C	91-93
94-96	6	5A	5A	5A	7A	8A	10B	11B	3A	4A	7B	7B	9C	13C	14C	12C	5A	6B	11D	9C	94-96
97-99	6	5A	5A	6A	8A	9B	11B	12B	4A	4A	7B	8B	10D	14C	15C	13C	5A	7B	12D	9D	97-99
100-102	6A	6A	6A	7B	9A	10B	12B	13B	4A	5A	8B	9C	10D	15C	16C	14C	6A	8B	13D	10D	100-102
103-105	7A	6B	6A	8B	10B	11B	13C	14C	4A	5B	9B	10C	11D	16C	17C	15D	7B	9C	14E	10D	103-105
MAXIMUM RESULT FOR MARK II WEAPON																					
106-108	7A	7B	7A	9B	11B	12C	14C	15C	5A	6B	10C	11C	11D	17D	18D	16D	8B	10C	15E	11D	106-108
109-111	7A	7B	8B	10C	12B	13C	15C	16C	5A	6B	11C	12D	12D	18D	19D	17D	9B	11C	16E	12E	109-111
112-114	8A	8B	9B	11C	13C	14C	16C	17C	6B	7B	12D	13D	12E	19D	20D	18D	10B	12D	17E	13E	112-114
115-117	8B	8B	10B	12C	14C	15D	17D	18D	6B	7C	13D	14D	13E	20D	21D	19E	11B	13D	18E	14E	115-117
118-120	8B	9B	11C	13D	15C	16D	18D	19D	7B	8C	14D	15E	13E	21E	22E	20E	12C	14D	19E	15E	118-120
MAXIMUM RESULT FOR MARK III WEAPON																					
121-123	9B	9B	12C	14D	16D	17D	19D	20D	7C	8C	15E	16E	14E	22E	23E	21E	13C	15E	20E	17E	121-123
124-126	9B	10C	13C	15D	17D	18E	20D	21D	8C	9D	17E	17E	15E	23E	24E	22E	14C	16E	22E	19E	124-126
127-129	9B	10C	14D	16E	18D	19E	21E	22E	8C	9D	29E	18E	16E	24E	25E	24E	15C	17E	24E	21E	127-129
130-132	10C	11C	15D	17E	19E	20E	22E	23E	9D	10D	21E	19E	17E	25E	26E	26E	16D	18E	26E	23E	130-132
133-135	10C	12D	16E	18E	20E	21E	23E	24E	9D	11E	23E	20E	18E	26E	27E	28E	17D	19E	28E	25E	133-135
MAXIMUM RESULT FOR MARK IV WEAPON																					
136-138	11C	13D	17E	19E	21E	22E	24E	25E	10D	12E	25E	21E	19E	27E	28E	30E	18D	20E	30E	28E	136-138
139-141	12D	14E	18E	20E	22E	23E	25E	26E	11E	14E	27E	22E	20E	29E	30E	32E	20E	22E	32E	31E	139-141
142-144	14D	16E	19E	21E	23E	25E	27E	28E	12E	16E	29E	24E	22E	31E	32E	34E	22E	24E	34E	34E	142-144
145-147	16D	18E	21E	23E	25E	27E	29E	30E	13E	18E	31E	26E	24E	33E	34E	36E	24F	26E	36E	38E	145-147
148-150	18E	20E	23E	25E	27E	29E	31E	32E	18E	20E	33E	28E	35E	35E	36E	38E	26E	28E	38E	40E	148-150
MAXIMUM RESULT FOR MARK V WEAPON																					
	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	

Consult master weapons chart for actual failure range of hand weapon. If a failure is rolled, roll 1D10: 01-05: ammunition jammed; gun inoperative 1-10 rounds; UM 06-08 weapon malfunction, roll on Malfunction/repair table; UM 09-10 fumble weapon (roll on hand weapon fumble chart).



5.81 PUNCTURE

	"A"	"B"	"C"	"D"	"E"
01-05	Zip.	Glancing blow. No extra damage. +0	+1 Hit.	+2 Hits.	+3 Hits.
06-10	+1 Hit.	+2 Hits.	+3 Hits.	+4 Hits.	Unbalance foe with a nice grazing strike. You gain initiative. +5 Hits.
11-15	You receive initiative for next round. +1 Hit.	Glancing blow to foe's side. +2 Hits. You receive initiative next round.	Blow to foe's side. +5 Hits. You receive initiative next round.	+2 Hits. Foe must parry for next round.	+3 Hits. Foe must parry next round.
16-20	Foe must parry next round. +1 Hit.	Blow to side. +2 Hits. Foe must parry next round at -10.	Blow across side. Foe must parry next round at -20. +3 Hits.	Minor side wound. Foe fights at -10. You have the initiative next round.	Stun foe for 1 round. Add 20 to your next attack.
21-35	Foe must parry next round. +2 Hits. Add 10 to next attack.	Foe must parry next round at -20. +2 Hits.	You wound foe along side of chest. Foe is stunned 1 round and takes 1 Hit per round.	You wound foe along side of hip. Foe is stunned 1 round and takes 2 Hits per round.	Foe receives minor side wound. +2 Hits. Foe is at -10. Foe takes 2 Hits per round.
36-45	Minor calf wound. Foe receives 1 Hit per round.	Minor calf wound. Foe takes 1 Hit per round. +2 Hits.	Minor calf wound. Foe takes 2 Hits per round.	Minor thigh wound. Foe takes 3 Hits per round.	Thigh strike. If foe has leg armor, +3 Hits. If foe has no armor, +2 Hits and 3 Hits per round.
46-50	Strike along foe's back. +2 Hits. Foe must now parry next round at -30.	Strike along foe's back. Foe is stunned for 1 round and takes 1 Hit per round.	Strike across foe's back stuns foe for 2 rounds. Foe takes 1 Hit per round.	Strike to foe's lower back. Foe is stunned and is unable to parry next round. +6 Hits.	Strike to foe's lower back. Foe takes 3 Hits per round. +5 Hits. Foe is stunned and is unable to parry next round.
51-55	Strike to foe's chest. Foe must parry next round at -25. Foe takes 2 Hits per round.	Minor chest wound. Foe takes 2 Hits per round. +3 Hits. Foe must parry for next 2 rounds.	Minor chest wound. Foe takes 2 Hits per round. +3 Hits. Foe is stunned for 2 rounds.	Strike to chest. +5 Hits. Foe takes 3 Hits per round and fights at -15. Foe must parry next round.	Chest wound. Foe takes 4 Hits per round. +5 Hits. Foe fights at -10. Foe is stunned and is unable to parry next round.
56-60	Minor thigh wound. Foe takes 2 Hits per round. +2 Hits. Foe is stunned next round.	Minor thigh wound. Foe takes 2 Hits per round. +3 Hits. Foe is stunned and is unable to parry next round.	Minor thigh wound. +5 Hits. Foe takes 2 Hits per round and is at -10. Foe is stunned for 2 rounds.	Strike to thigh. Foe takes 3 Hits per round. Foe is stunned and is unable to parry next round. +3 Hits.	Thigh wound. Foe takes 5 Hits per round. +6 Hits. Foe is stunned and is unable to parry next round.
61-65	Minor forearm wound. +2 Hits. Foe takes 2 Hits per round. Foe is at -10.	Minor forearm wound. Foe is stunned during next round. +2 Hits. Foe is at -10 and takes 2 Hits per round.	Forearm wound. Foe takes 2 Hits per round and is at -10. +3 Hits.	Forearm wound. Foe takes 3 Hits per round and is at -10. +3 Hits. Foe is stunned for 2 rounds.	Forearm wound. Foe takes 3 Hits per round and is at -15. +5 Hits. Foe is stunned for 2 rounds.
66	Strike through foe's non-weapon shoulder. Arm is useless. Add +10 to your next attack. Foe is stunned for 3 rounds.	Strike shatters elbow in foe's weapon arm. +3 Hits. Arm is useless. Foe is stunned 4 rounds and cannot parry for 2 rounds.	Strike shatters foe's knee. Foe is knocked down, is at -90, and stays down for 3 rounds. Foe is unable to parry for 3 rounds.	Strike to side of head. Foe is knocked out for 6 hours. +10 Hits. If foe has no helmet, you kill him.	Strike through both of foe's lungs. Foe drops and passes out. Foe dies in 6 rounds. Add +10 to your next attack.
67-70	Strike along foe's neck. +5 Hits. Foe is stunned for 3 rounds and cannot parry next round.	Strike to foe's neck area. Foe takes 3 Hits per round and is at -5. Foe is stunned for 2 rounds.	Strike along foe's neck. Foe is stunned for 3 rounds and cannot parry for 2 rounds. Add +15 to your next attack.	Strike foe in shoulder. +3 Hits. Foe is stunned and is unable to parry for 2 rounds. Foe is at -20.	Strike foe in shoulder. Sever muscle and tendons. Arm is useless. Foe takes 3 Hits per round and is stunned for 6 rounds.
71-75	Strike lower leg. Tear tendons. Foe is at -25. +3 Hits. Foe is stunned and is unable to parry next round.	Strike to foe's calf. Slash muscle. Foe is at -40. +3 Hits. Foe is stunned and is unable to parry for 2 rounds.	Strike to lower leg. Foe is stunned and is unable to parry for 2 rounds. +5 Hits. Foe is at -50. Slash muscle and tendons.	Strike to lower leg. Foe is at -50. Slash muscle and cartilage. +6 Hits. Foe is stunned and is unable to parry for 2 rounds.	Strike through lower leg. Foe is stunned and unable to parry for 3 rounds. Sever muscle. Foe is at -75.
76-80	Strike to foe's upper arm. +3 Hits. Foe takes 3 Hits per round and is at -30. Foe is stunned for 3 rounds.	Strike through muscle in foe's non-weapon arm. Foe is at -30 and takes 3 Hits per round. Foe is stunned for 3 rounds.	Strike foe in non-weapon arm. Tear muscle and tendons. Foe takes 3 Hits per round, fights at -25. Foe is stunned for 6 rounds.	Strike foe in non-weapon arm. Arm is useless. Foe is stunned for 6 rounds. Foe takes 3 Hits per round. +12 Hits.	Strike foe in weapon arm. Bone is broken. Foe is stunned and is unable to parry for 3 rounds. +10 Hits.
81-85	Side wound. Foe takes 5 Hits per round and is stunned for 6 rounds. Add +20 to your next attack.	Side wound. +6 Hits. Foe takes 5 Hits per round. Foe is at -25. Foe is stunned and is unable to parry for 3 rounds.	Side wound. +7 Hits. Foe takes 5 Hits per round. Foe is at -30. Foe is stunned and is unable to parry for 3 rounds.	Major abdominal wound. Foe takes 6 Hits per round. +10 Hits. Foe is stunned and is unable to parry for 3 rounds. Foe is at -20.	Strike through foe's back severs a vein. Foe is stunned and is unable to parry for 12 rounds — then dies.
86-90	Strike foe in back. Foe is at -20 and takes 3 Hits per round. Foe is stunned and is unable to parry for 2 rounds.	Strike to back of head. If foe has no helmet, he dies. If foe has a helmet, +6 Hits and foe is down for 2 rounds.	Strike to back of head. If foe has no helmet, he dies. If foe has a helmet, he is knocked down and stunned for 6 rounds.	Strike through foe's kidneys. Foe drops. +9 Hits. Foe dies after 6 rounds of very intense agony. Sad.	Strike through leg severs an artery. Foe drops, lapses into unconsciousness, and dies after 12 rounds.
91-95	Rip off foe's ear. +3 Hits. Foe takes 2 Hits per round, hears at -50. Foe is stunned and is not able to parry for 2 rounds.	Strike through foe's hip. Foe takes 3 Hits per round. +5 Hits. Foe is stunned next round. Foe is at -25.	Strike through foe's chest severs a vein. Foe drops immediately and dies in 9 rounds due to shock and blood loss.	Strike through foe's side destroys a variety of organs. Foe fights normally for 6 rounds then dies.	Sever artery in foe's arm. Foe is stunned for 12 rounds and then dies.
96-99	Strike foe's nose. There is a permanent scar. Foe takes 3 Hits per round. Foe is stunned and is not able to parry for 3 rounds.	Strike through foe's cheek. Foe drops and dies after 9 rounds of incapacity. Add +20 to your next attack.	Strike through foe's neck breaks backbone and severs spine. Foe is paralyzed from the neck down... permanently.	Nail the sucker in lower back. Internal bleeding and shock kill foe in 6 rounds. Foe is down and out.	Shot through heart sends foe reeling 10 feet to a spot suitable for dying.
100	Strike through neck. Sever vein and artery. Foe cannot breathe. Foe drops and dies immediately of massive heart failure.	Strike through foe's eye. Foe dies instantly. Add +10 to all friendly attacks within 30 feet next round.	Shot through both ears proves effective. Foe dies instantly. Add +20 to your next 6 rounds. Very neat.	Strike through brain makes life difficult for foe. You have ½ round to act. Add +20 to your next attack.	Strike through foe's eye. Foe dies instantly. Add 25 to your next attack. Carry on.

5.82 SLASH

	"A"	"B"	"C"	"D"	"E"
01-05	Zip.	Weak strike yields no extra damage. +0	+2 hits.	+2 hits	+3 hits
06-10	+1 hit.	+2 hits	+3 hits.	+4 hits	Unbalance foe. +5 hits. You receive initiative next round. +4 hits.
11-15	You receive initiative next round. +1 hit.	Glancing blow to foe's side. +3 hits. You receive initiative next round.	Blow to foe's side yields +6 hits. You receive initiative next round.	+3 hits. Foe must parry for next round of action.	Foe must parry next round of action.
16-20	Foe must parry next round. +1 hit.	Blow to side. +2 hits. Foe must parry next round at -10.	Blow to side. +4 hits. Foe must parry next round -20.	Minor side wound. Foe fights at -10. +2 hits. You receive initiative next round.	Stun foe for 1 round. Foe may r parry. Add +10 to your next swing.
21-35	Foe must parry next round. +2 hits. Add +10 to next swing.	Foe must parry next round -20 +2 hits.	You break foe's rib. 3 extra hits. Foe is stunned next round.	Strike to side. Foe is stunned for next round and cannot parry. +3 hits.	Foe receives minor side wound, fights at -10 and takes 1 hit per round. +3 hits.
36-45	Minor calf wound. Foe receives 1 hit per round.	Minor calf wound. Foe takes 1 hit per round. +2 hits.	You slash foe's leg. Foe takes 2 hits per round. +2 hits.	You slash foe's upper leg and deliver 3 extra hits. Foe takes 2 hits a round.	Blow to foe's upper leg. If foe has leg armor +5 hits. If foe has no armor, +3 hits and +3 hits per round.
46-50	Blow to foe's back. +2 hits. Foe must parry next round -30.	Blow to foe's back. Foe must parry next round at -30. +4 hits.	Blow to foe's back stun foe 1 round. Foe may not parry. +3 hits and 1 hit per round.	Strike foe's lower back. Foe may not parry and is out next round. +3 hits. Foe takes 2 hits per round.	Strike to foe's lower back. Foe may not parry and is out next round. +4 hits. Foe takes 3 hits per round.
51-55	Blow to foe's chest. +2 hits. Foe must parry next round -25. Foe's wound gives 1 hit per round.	Minor chest wound. Foe takes 1 hit per round and must parry next 2 rounds. +3 hits. Foe fights -5.	Minor chest wound. +4 hits. Foe takes 2 hits per round and fights at -10. Foe must parry next round.	Medium chest wound. +5 hits. Foe takes 3 hits/rnd, fights -15, must parry next rnd.	Chest wound. Foe takes 4 hits per round, is at -10, and is stunned 2 rounds. +6 hits.
56-60	Minor thigh wound. Foe takes 2 hits per round and must parry next round. +3 hits.	Minor thigh wound. Foe takes 2 hits per round. +4 hits. Foe must parry next two rounds.	Minor thigh wound. Foe takes 2 hits per round. +5 hits. Foe is stunned next round.	Medium thigh wound. +6 hits. Foe takes 2 hits per round and is stunned 2 rounds.	Thigh wound. Foe is stunned for 2 rounds. +8 hits. Foe takes 5 hits a round.
61-65	Minor forearm wound. +3 hits. Foe takes 2 hits per round and is at -10.	Minor forearm wound. Foe is stunned next round. +4 hits. Foe takes 2 hits per round and is at -10.	Medium forearm wound. +4 hits. Foe takes 3 hits per round, is at -10, and is stunned next round.	Medium forearm wound. +4 hits. Foe takes 3 hits per round, is at -10, and is stunned next 2 rounds.	Forearm wound. Foe is stunned for 2 rounds. +6 hits. Foe takes 3 hits per round and is at -15.
66	You shatter shoulder in foe's non-weapon arm. Arm is useless. +10 next swing. Foe is stunned 3 rounds. +9 hits. Your initiative.	Shatter elbow in foe's weapon arm. +8 hits. Foe is stunned 4 rounds and cannot parry during first 2 rounds.	You shatter foe's knee. Foe is knocked down. +6 hits. Foe at -90 and is down for 3 rounds. (and cannot parry).	You knock foe out for 6 hours with a strike to side of head. +15 hits. If foe has no helmet, you kill him instantly.	Sever foe's weapon arm. +12 hits. Foe expires in 12 rounds, but drops immediately. Add +10 to your next swing.
67-70	Slash foe's neck. +6 hits. Foe is stunned for 3 rounds and cannot parry during next round.	Blow to foe's neck area. Foe takes 3 hits per round and fights at -5. Stun foe 2 rounds. +7 hits.	Slash foe's neck. Foe is stunned 4 rounds and cannot parry during next 2 rounds. +8 hits. +10 next round.	Slash muscle in foe's shoulder area. +5 hits. Foe is stunned 3 rounds, and is at -20. Add +10 to your next swing.	Slash tendons and crush the bone in foe's left shoulder. Arm useless and foe takes 2 hits per round. Stun foe 4 rounds.
71-75	Slash tendons in foe's lower leg. Foe at -30 and takes 2 hits per round. +4 hits. Stun foe 2 rounds. Poor sucker.	Slash muscle in foe's calf. Foe is stunned for 3 rounds and cannot parry during next round. +6 hits. Foe at -40.	Slash muscle and tendons in foe's lower leg. Foe is stunned for 2 rounds and cannot parry. +7 hits. Foe at -45.	Slash muscle and sever tendons in foe's lower leg. Foe is stunned for 3 rounds and cannot parry for next 2. Foe at -50.	Slash foe's lower leg and sever muscle and tendons. Foe at -70 +8 hits. Stun foe 6 rounds.
76-80	Slash foe's upper arm. +5 hits. Foe takes 3 hits per round and is at -25. Foe is stunned and unable to parry 2 rounds.	Slash muscle in foe's non-weapon arm. Foe is at -30 and takes 3 hits per round. Foe is stunned and unable to parry for 2 rounds. +6 hits.	Slash muscle and tendons in foe's non-weapon arm. +9 hits. Foe takes 4 hits per round and arm is useless. Foe is stunned 6 rounds.	Slash muscle and tendons in foe's weapon arm. Arm is useless (he drops weapon) and foe is stunned 4 rounds. Foe cannot parry next 2 rounds. +10 hits.	Slash tendons and break bone in foe's non-weapon arm. Arm is useless. +12 hits. Foe is stunned and unable to parry for next 3 rounds.
81-85	Slash foe in side. +6 hits and a major wound. Foe takes 6 hits a round and is stunned 5 rounds. Add +20 to your next swing.	Slash foe in side. +7 hits and a major wound. Foe takes 6 hits per round. Foe is stunned and cannot parry for next 2 rounds.	Strike to foe's side. +8 hits. Foe takes 4 hits per round and is at -20. He/she/it is stunned and cannot parry for next 2 rounds.	Major abdominal wound. +10 hits. Foe takes 8 hits per round, is stunned for 4 rounds, and is unable to parry for next 2 rounds. Foe at -10.	Sever opponent's hand. +5 hits. Foe is stunned and unable to parry for next 12 rounds. Foe then dies.
86-90	Slash foe in back. +8 hits. Foe is stunned and cannot parry for 2 rounds. Wound yields 2 hits a round. Foe at -10.	Strike to back knocks foe down. Foe is stunned and unable to parry for 3 rounds. +10 hits. Foe takes 3 hits a round.	Blast to back breaks bone and knocks foe down. +9 hits, foe at -10 and is stunned and unable to parry for 4 rounds.	Sever opponent's hand. +6 hits. Foe is stunned for 6 rounds, unable to parry. Foe then drops and dies 6 rounds later.	Sever foe's leg. +15 hits. Foe drops and lapses into unconsciousness. Foe dies in 9 rounds. Add +10 to your next swing.
91-95	Cut off foe's ear. +3 hits. Foe takes 3 hits per round and hears at -50. Foe is stunned 3 rounds and unable to parry next round.	Strike to foe's hip. +7 hits and foe is stunned 3 rounds. Foe cannot parry next round and fights -20. Add +10 to your next swing.	Sever foe's leg. Foe drops immediately and dies in 6 rounds due to shock and blood loss. +20 hits.	Sever foe's weapon arm. Foe is stunned and unable to parry for next 9 rounds. Foe then dies. +15 hits.	Sever foe's spine. +20 hits. Foe collapses in a second, and is paralyzed from the neck down permanently.
96-99	Slash foe's nose. Minor wound. +2 hits and a permanent scar. Foe takes 2 hits a round and is at -30 Foe stunned 6 rounds.	Strike to foe's head and neck breaks skull and causes massive brain damage. Foe drops and dies in 6 rounds. +20 hits.	Sever foe's non-weapon arm. Foe is stunned and unable to parry for next 12 rounds. Foe then dies. +18 hits.	Slash foe's side. +20 hits. Foe dies in 3 rounds due to massive internal organ damage. Foe is down and unconscious immediately.	Strike to foe's head destroys brain and makes life difficult for the poor fool. Foe expires in a heartbeat immediately.
100	Neck strike severs carotid artery and jugular vein. Foe's neck is broken. Foe dies in 1 round of intense agony.	Disembowel foe, killing him instantly.	Destroy foe's eyes. +5 hits and foe is stunned and unable to parry for next 30 rounds.	Impale adversary in heart. +12 hits. Foe dies instantly. Heart is destroyed.	Strike to foe's groin area. +10 hits. All vitals are destroyed immediately. Foe is stunned, anguished, and unable to parry for 12 rounds.

5.83 UNBALANCE

	"A"	"B"	"C"	"D"	"E"
01-05	Nary a thing extra. +0 Hits.	Fairly weak. +0 Zip.	Nope.	+1 Hit.	+2 Hits.
06-10	Sorry pal, maybe next time.	+1 Hit.	+2 Hits.	+3 Hits.	+5 Hits.
11-15	Glancing strike. +3 Hits.	Lame side strike. +4 Hits.	Weak blow. +5 Hits.	Back strike. +6 Hits.	Blow to back. +7 Hits.
16-20	Foe must parry next round. +3 Hits.	Glancing side blow. +4 Hits and foe must parry next round.	Side strike. Foe must parry next round. +5 Hits.	Blow to foe's side. Foe is at -10 next round. +7 Hits.	Side blow. Foe is at -20 next round. +8 Hits.
21-35	On line, but weak. Foe must parry next round. +4 Hits.	Foe is unbalanced and is at -20 next round. +5 Hits.	Chest strike. Foe is stunned next round. +6 Hits.	Blow is weak but stuns foe for next round. +8 Hits.	Blow cracks foe's rib. Foe is stunned and is at -10 next round. +9 Hits.
36-45	Break foe's concentration. You gain initiative for next round. +4 Hits.	Leg strike unsteadies foe. +5 Hits. You gain initiative next round. Foe is at -5 for 2 rounds.	Blow to leg. Foe is at -40 next round. +5 Hits.	Calf strike. Foe's hurt muscle impairs maneuvers by -25. You gain the initiative next round. +7 Hits.	Hard glancing blow to leg. If foe has leg armor, +10 Hits. If not, +12 hits and foe is stunned for 2 rounds.
46-50	Back strike. +5 Hits. Foe must parry next round at -10. Good, glancing shot.	Back hit forces foe to parry next round at -20. +5 Hits.	Lower back strike. Foe reels and is stunned and unable to parry next round. +5 Hits.	Blow to back spins foe. +8 hits and foe is stunned and unable to parry next round.	Strong back blow staggers foe. +12 Hits. Foe is stunned and sadly unable to parry next round.
51-55	Chest strike knocks foe back. Foe must parry next round at -20. +5 Hits.	Blow stuns foe for next round. +5 Hits.	Blast staggers foe. +6 Hits and foe is stunned and unable to parry next round.	Chest strike takes wind out of foe. +10 Hits. Foe is stunned and unable to parry next round.	Foe is knocked down. +12 Hits. Foe is stunned for 2 rounds and unable to parry next round.
56-60	Glancing leg strike. If foe has leg armor, +5 Hits. If not, +7 Hits and foe is stunned next round.	Thigh strike bruises foe. +6 Hits. Foe is forced to parry at -30 next round.	Skipping calf strike. If foe has leg armor, +7 Hits. If not, +9 Hits, foe is stunned 2 rounds, and moves at -10.	Thigh strike. +12 Hits. Foe is stunned for 2 rounds. You have initiative next 3 rounds.	Glancing strike to leg. Foe is stunned for 3 round. +14 Hits.
61-65	Arm strike. Foe is stunned for next round. +6 Hits.	Forearm strike disarms foe. +6 Hits.	Shoulder strike disarms foe and leaves foe stunned for next 2 rounds. +6 Hits.	Arm strike disarms foe. Foe is stunned for 2 rounds. Add +20 to next action. +7 Hits.	Blow to shoulder spins foe. +13 Hits. Foe is stunned and unable to parry for 2 rounds.
66	Shoulder strike sends foe spinning. +7 Hits. Foe is stunned and unable to parry for 2 rounds while regaining bearings.	Elbow strike numbs foe's forearm. +8 Hits. Foe drops his weapon and is stunned and unable to parry 2 rounds.	Knee strike knocks foe down. +9 Hits. Foe is at -80 due to broken knee and is stunned and unable to parry for 3 rounds.	Hard hit strike. If foe has helmet, he is knocked back 10 feet and stunned for 6 rounds. If not, foe is knocked out for 24 hours.	Foe is knocked down and is unconscious. +30 Hits.
67-70	Chest strike unbalances foe. +6 Hits. Foe is unbalanced and fights at -50 for 2 rounds.	Blow to foe's chest. +7 Hits. Confused foe is stunned and unable to parry next round.	Strike to chest. Foe is at -20 due to broken ribs. +8 Hits. Foe is stunned for 2 rounds.	Shoulder strike spins foe. +10 Hits. Foe is at -25 due to broken collar bone and is stunned and unable to parry next round.	Shoulder blast knocks foe down. Foe is stunned and is unable to parry for 2 rounds and is at -10 due to minor fracture.
71-75	Blow to foe's lower leg. Foe is stunned for 2 rounds. +7 Hits.	Blow bruises foe's calf. Foe is stunned next round. +9 Hits. Foe is at -10.	Bruise foe's leg. +10 Hits. Foe is stunned and unable to parry next round. Foe operates at -20.	Blow breaks foe's leg. Foe moves at -75. +12 Hits. Foe is stunned and unable to parry next round.	Hard blow to foe's thigh knocks foe down. +15 Hits. Foe is stunned and unable to parry for 3 rounds.
76-80	Blow to foe's weapon hand. If foe has a weapon, it is torn away and +8 Hits. If not, +12 Hits and foe is stunned for 2 rounds.	Strike to foe's non-weapon arm. Foe is stunned for 2 rounds and is knocked backwards 5 feet. +10 Hits. Bruised foe is at -10.	Strike to foe's weapon arm. Foe is knocked back 5 feet and is stunned for 3 rounds. +11 Hits. Mild fracture. Foe is at -25.	Strong blow to foe's weapon arm. Foe is knocked back 10 feet. +10 Hits. Foe is at -25 and drops weapon. Foe is stunned for 3 rounds.	Strike to foe's shield arm. Foe stumbles back 3 feet and falls down. +15 Hits. Foe is stunned and is unable to parry for 4 rounds and is disarmed.
81-85	Side strike. +12 Hits. Foe is stunned and unable to parry next round. Add +10 to your next roll.	Blow to foe's side. Foe is knocked sideways 3 feet and is stunned for 3 rounds. +15 Hits.	Shot to side knocks foe 5 feet sideways. Foe drops anything carried in his non-weapon hand and is stunned for 6 rounds.	Strike to foe's left side knocks foe 5 feet sideways. Foe breaks ankle and falls down. Foe is at -50. +11 Hits.	Awesome side shot sends foe tripping sideways. Foe breaks leg and rolls 5 feet. Foe is at -50, is stunned and unable to parry for 6 rounds.
86-90	Blow to back. Foe stumbles 5 feet side ways and is stunned for 3 rounds. +13 Hits. Add +20 to your next roll.	Strike to foe's back knocks foe sideways 10 feet. +12 Hits. Foe is stunned and unable to parry for 2 rounds.	Precise back strike knocks foe down. Foe is disarmed and stunned for 6 rounds. +14 Hits. Add +20 to your next roll.	Brutal back strike knocks foe down. +12 Hits. Foe is disarmed and stunned and unable to parry for 4 rounds.	Cruel head strike... Foe sees stars (more than usual). +20 Hits. Foe is knocked 10 feet backwards and is stunned and unable to parry for 12 rounds.
91-95	Head strike breaks foe's nose. If foe has helmet, he is stunned for 3 rounds. If not, foe is knocked out for at least 2 hours.	Blow to side of foe's head crushes ear area. Foe is stunned for 6 rounds. +9 Hits. Foe is at -50 foe 3 weeks... impaired balance.	Side strike spins foe 10 feet sideways. Foe must roll on appropriate fumble table next 3 rounds. +8 Hits.	Strike to foe's non-weapon arm. If foe has a shield or armor, he takes +10 Hits. If not, Foe's arm is useless and he is stunned for 9 rounds.	Blow to foe's shoulder. If foe has a shield or armor, he is stunned for 6 rounds. If not, he is knocked down, has a useless arm, and passes out.
96-99	Nicely placed strike sends foe sprawling on his face. +10 Hits. Foe is stunned and unable to parry for 3 rounds.	Side strike causes foe to ungracefully stumble to an embarrassing prone position. Foe is stunned and unable to parry 6 rounds.	Smooth and snazzy strike sends foe to his knees. If foe was using 1-hand weapon, it is thrown backwards 10 feet. Foe is stunned for 24 rounds.	Strike top foe's head sends him 10 feet backwards. If foe has helmet, +9 Hits, the helmet is destroyed, and foe is stunned for 6 rounds. If not, foe is sent into a coma for 4 weeks.	Pinpoint strike breaks foe's neck. Foe falls back 5 feet, spins, and stumbles to the ground. Foe dies of shock and suffocation in 3 rounds.
100	Brutal hip strike knocks foe down, tears tendon, and shatters joint. Foe stunned and unable to parry for 9 hours. Leg useless, foe -90.	Inspired back strike sends foe flying 10 feet and onto his face. Severe nerve damage. Foe is paralyzed from waist down.	Upper chest strike knocks foe 10 feet sideways. Foe falls down and breaks both arms. For is sent into a 2 month coma.	Savage blow to foe's head knocks foe down. Foe falls into coma and dies in 12 rounds due to severed vein. Add +20 to next roll.	Frightening strike to foe's temple knocks foe back 20 feet. Foe dies instantly. Add +20 to your next 3 rolls. Blind now.

5.84 BURN	"A"	"B"	"C"	"D"	"E"
01-05	Hot air. +0 hits.	Hot draft; +0 hits.	+1 hit.	+2 hits.	+3 hits.
06-10	+1 hit.	+2 hits.	+3 hits.	+4 hits.	Foe loses initiative for 1 round. +4 hits.
11-15	Foe loses initiative for 1 round. Hard, hot breeze. +2 hits.	Foe loses initiative for 1 round. Strong heat; little effect. +2 hits.	Foe loses initiative for 1 round while he recovers his balance. +3 hits.	Foe loses initiative for 1 round. Not quite singed. +4 hits.	Foe feels heat. Foe loses 1 round initiative. If he has no armor, he loses 2 rounds initiative. Either way, +5 hits.
16-20	Foe loses initiative for 1 round. The nearby fire gives foe 3 more hits. Good blast, weak fire.	Blast unbalances foe. Foe loses initiative for 2 rounds.	Foe loses initiative for 2 rounds. +5 hits.	Foe is unbalanced and must parry for 1 round. +6 hits.	Hot, unbalancing blast. Foe must parry for 1 round. +7 hits.
21-35	Blast unbalances foe. He loses initiative for 2 rounds. +4 hits.	Foe loses initiative for 2 rounds. Bothersome smoke. +6 hits.	Light burns. Foe must parry for 1 round. +7 hits; foe takes 1 hit per round.	Minor burns. Foe must parry for 2 rounds. +8 hits. Foe takes 1 hit per round.	Minor burns. Foe must parry for 2 rounds. +9 hits. Foe takes 2 hits per round.
36-45	Foe must parry for 1 round. +6 hits.	Light burns. Foe must parry for 1 round. +7 hits. Foe takes 1 hit per round.	Minor burns force foe to parry for 2 rounds. +8 hits and 1 hit per round.	Blast stuns foe for 1 round. +9 hits. Foe takes 2 hits per round due to pain and suffering.	Blast stuns foe for 1 round. +10 hits. Foe takes 3 more hits per round.
46-50	Light burns. Foe must parry for 1 round. +7 hits, and foe takes 1 hit per round.	Minor burns. Foe must parry for 2 rounds. +8 hits. Foe takes 1 hit per round.	Fire stuns foe for one round. +9 hits. Foe takes 2 hits per round. Minor burns.	Fire stuns foe for 1 round. +10 hits. Foe takes 3 hits per round. If foe is using a non-metallic tool or weapon, it is destroyed.	Fire stuns foe for 2 rounds. +12 hits and 3 hits per round. If foe is using a non-metallic tool, it is destroyed.
51-55	Blast unbalances foe. +8 hits. Foe must parry for two rounds and takes 1 hit per round.	Blast stuns foe for 1 round. +8 hits. Foe takes 2 hits per round. Wide shot, strong fire.	Blast stuns foe for 2 rounds. +9 hits. If foe has leg armor, he takes 1 hit per round. If not, foe takes 3 hits per round.	Blast stuns foe for 2 rounds. If foe has a helmet he takes 8 hits and 2 per rnd; otherwise he takes 11 hits and 4 per round.	Foe reels back 3 feet. +13 hits. Foe is stunned and unable to parry for 1 round. Foe takes 3 hits per round from hot blast.
56-60	Foe is stunned for 1 round. +9 hits. Foe loses initiative for 2 rounds and takes 2 hits per round.	Foe is stunned for 2 rounds. If foe is in metal armor and has leg armor: +8 hits. If not: +9 hits and 3 hits per round.	Blast stuns foe for 2 rounds. +10 hits. Foe takes 2 hits per round. All other cloth covering on foe's back is destroyed.	Foe's clothing ignites. +12 hits. Foe is stunned and unable to parry for 1 round. Takes 2 rounds to extinguish fire. Foe takes 9 hits each round aflame.	Fire stuns foe 2 rounds; +15 hits. Foe cannot parry for 1 rnd. He fights at -10 and burns deliver 3 hits per round.
61-65	Foe is stunned for 2 rounds. If foe has leg armor, he takes +7 hits and one hit per round. If not, he takes 10 hits and 3 hits per round.	Foe is stunned and unable to parry for 1 round. +9 hits, and 2 hits per round. Foe fights at -5 (leg burns).	Foe is stunned and unable to parry for 1 round. +10 hits, foe takes 3 hits per round and fights at -10. Upper leg burns.	Foe is stunned 2 rounds and unable to parry for 1. If foe has leg armor, he takes +10 hits and 4 hits per round. If not, +13 hits and 6 hits per round.	Searing blast burns foe's legs. Foe is stunned and unable to parry for 2 rounds. He takes 4 hits per round and fights at -10. +15 hits.
66	Blast causes foe to drop whatever he is holding. +9 hits. Foe is stunned and unable to parry for 2 rounds. He fights at -15. Chest burns.	Foe is stunned 2 rounds. If foe wears non-metallic armor, it is now useless. +10 hits. Foe takes 4 hits per round from chest blast.	Chest blast knocks foe down. +12 hits. If foe has arm protection, he takes 2 hits per rnd; if not his weapon arm is useless and he takes 4 hit/rnd.	Neck blast. If foe has neck armor, he takes 3 hits/rnd and fights at -10. If not, foe is unconscious and taking 10 hits per round.	Head strike. If foe has a helmet, he is knocked out and takes 5 hits per rnd. If not, foe is killed instantly, his head vaporized. Fine aim.
67-70	Back blast. Foe is stunned for 2 rounds. Foe takes 2 hits per round and fights at -5. +8 hits.	Back blast. Foe is stunned for 2 rounds and unable to parry for 1 round. Foe takes 2 hits per round and fights at -10. +7 hits.	Back blast. Foe is stunned for 2 rounds and unable to parry for 1 round. Foe takes 2 hits per round and fights at -15.	Back blast. Foe is knocked down. +15 hits. Foe is out of action for 1 round. Foe takes 3 hit/rnd; all organic material on his back is destroyed.	Blast to foe's left arm. If using a 2-handed weapon, drops it. If he has arm armor, he takes 4 hits/rnd and fights at -15. If no armor, foe takes 5 hits/rnd, arm useless.
71-75	Hot smoke blinds foe. Foe is stunned and unable to parry for 1 round. +12 hits.	Chest blast. Foe is stunned for 2 rounds and unable to parry for 1 rnd. Foe fights at -15. Add 10 to your next swing. +9 hits.	Chest blast. Foe is stunned for 3 rounds. If foe has organic chest armor, it is destroyed. If no chest armor, foe takes 6 hits per round and fights at -25.	Blast to foe's non-weapon arm. If foe is using a two-handed weapon, he drops it. He is stunned 6 rounds, loses use of arm and fights at -50.	Chest blast. If foe has chest armor, it is destroyed. Foe takes +12 hits and is stunned 3 rounds. Otherwise, foe is down, takes 6 hit/rnd, fights at -60.
76-80	Blast stuns foe for 2 rnds. Foe cannot parry for 1 round. +10 hits. Side wound. Foe takes 2 hits per round.	Arm strike. Burns stun foe for 2 rounds. Foe takes 2 hits per round. All cloth on foe's weapon arm is burned off and foe drops whatever he is holding.	Blast to foe's shield arm. If foe has a shield, he drops it. If it is an organic shield, it is destroyed. If foe has no shield, he is stunned 6 rds, loses use of arm, fights at -30%.	Foe loses weapon hand. Severe burns. Any item in hand possibly damaged. Foe is stunned and unable to parry for 3 rounds, and takes 5 hits per round.	Blast to foe's non-weapon arm. Foe loses use of arm and is knocked unconscious. +20 hits.
81-85	Back blast. Foe is stunned for 2 rounds, and burns deliver 2 hits per round. He is at -20. +8 hits.	Back blast. Foe is knocked down. All organic material on foe's back is destroyed. Foe is stunned 1 rnd and takes 2 hits/rnd.	Blast to foe's non-weapon arm. Foe is stunned and unable to parry 6 rounds, loses use of arm, and fights at -80.	Blast burns both of foe's arms and all of upper chest. Foe loses use of arms (drops whatever he was holding) and is stunned 9 rounds. +15 hits.	Foe inhales flame and gets parched throat and lungs. Foe expires in 12 painful rounds. +20 hits.
86-90	Blast knocks foe down. Fire destroys any of Foe's organic foot and calf covering. +10 hits.	Leg strike. Any organic leg covering catches fire and delivers 6 hits per round until extinguished — which takes 1 round. Foe is stunned for 3 rounds. +10 hits.	Foe loses foot, but wound is cauterized. Foe is stunned and unable to parry for six rounds, takes +3 hits per round, and fights at -85. +15 hits.	Abdomen strike. If foe has abdominal armor, it is destroyed, foe is knocked out and takes 2 hits/rnd. If not, foe dies in 12 rounds from organ damage.	Foe's lower body is engulfed in flames. Foe dies in 9 rounds as a result of organ and tissue loss. +20 hits.
91-95	Fire burns foe in hip area. Foe is stunned and unable to parry for 2 rounds. oe fights at -30. +12 hits.	Head strike. Foe is blinded and fights at -95 for 6 rnds. If foe has no helm, he takes 8 hits per round and loses 50% of head hair.	Upper leg burns. Foe loses foot, but wound is cauterized. Foe is stunned and unable to parry for 6 rounds, takes +4 hits per round and fights at -90. +18 hits.	Head strike. If foe has a closed helmet, he is in a coma for 2 days. If not, foe dies in 6 rounds due to shock and brain damage. +20 hits.	Chest strike. All organic material on foe's body is destroyed. Foe dies of shock and nerve damage in 6 rounds. +25 hits.
96-99	Blast to foe's neck area. If foe has neck armor, he is stunned and unable to parry for 3 rounds. If not, foe is down and taking 8 hits per rnd.	Neck strike destroys foe's throat. +20 hits. Foe takes 12 hits per round and is inactive for 9 rounds. Foe then dies. Add 10 to your next roll.	Chest strike. If foe has chest armor, it is utterly destroyed and foe dies of burns in 9 rnds. If not, foe's chest cavity is a hollow cinder and he dies instantly.	Foe's side is engulfed in flames. Foe dies in 6 rounds due to multiple compound fractures, tissue and organ loss, and boiling blood. +20 hits.	Foe is instantly dehydrated into dust. Add 10 to your next roll.
100	Searing blast to foe's head. +15 hits. If foe has helm, he is knocked out and takes 7 hits per rnd. If not, foe is in a coma for 1 month and loses 50% of Presence.	Blast to foe's neck fuses vertebrae and unites skin with clothing. Very unpleasant. Foe is paralyzed permanently. +25 hits.	Foe's head is but a charred stump. Sadly, foe cannot handle the loss and he dies instantly. Add +10 to your next roll.	Heat vaporizes foe's midsection, destroys foe's clothing, armor, and all items he carried. He is cut in half and dies. Add +15 to your next roll.	All that remains of foe are charred bits of teeth and bone. Add 20 to your next roll.

5.85 SHRAPNEL/AUTOMATIC

	"A"	"B"	"C"	"D"	"E"
01-05	A grazing shot; no extra Hits. Your gun just jammed...sorry.	You shoot off a piece of foe's equipment. +0 Hits.	Hit foe's weapon, destroying it and breaking one of foe's fingers. +2 Hits.	Foe is staggered by your effort. He is stunned next round. +6 Hits.	Foe urinates in fear. +7 Hits.
06-10	Just a nick...for +1 Hit.	+2 Hits.	Foe stunned next round. +3 Hits.	Foe, impressed with your hail of fire, is stunned for 2 rounds. +7 Hits.	You have initiative for the next 3 rounds. +10 Hits.
11-15	+3 Hit.	You have initiative next round as foe checks for damage. +4 Hits.	Hit foe's side in poorly aimed fire. +9 Hits. You have the initiative.	Solid hit to shoulder blade. Foe is stunned for 4 rounds and is unable to parry for 2 rounds. He takes 2 Hits per round. +9 Hits.	Foe fumbles weapon and is unable to parry when he is stunned next to rounds. +12 Hits.
16-20	Foe may not attack next round. +4 Hits.	Slash foe's side. He must parry next round. +5 Hits.	Blows to the sides cause foe to parry for 2 rounds. +9 Hits.	Foe takes 3 side strikes. He is stunned for 6 rounds and bleeds, taking 4 Hits per round +11 Hits. Add 10 to your next action.	Grazing head strikes stun foe for 3 rounds. He takes 2 Hits per round. +13 Hits. Add 25 to next attack.
21-35	You gain initiative next round. +4 Hits.	Foe must parry next round at -40 as the metal is too close for comfort. +6 Hits.	You shatter one of foe's ribs. Foe is stunned for 2 rounds, takes 2 Hits per round, and is knocked on his back. +11 Hits.	Foe hit in hip and along both sides. He is stunned and unable to parry for 4 rounds. He is at -45 and takes 2 Hits per round. +13 Hits.	Several ribs shatter in glancing blows. Foe takes 2 Hits per round and is stunned for 2 rounds with no parry. +15 Hits.
36-45	Blow to the calf. Foe receives 1 Hit per round unless armored. +5 Hits.	Strikes to calf and hand give +7 Hits. Foe is at -10.	Strike foe's knee and calf. Foe receives 4 Hits per round and foe is at -40. +12 Hits.	Foe doubles over with hits to the shin, thigh, and groin. He/she receives 5 Hits per round, is prone for 4 rounds and permanently sterile. +15 Hits.	Arm and leg strike. If armored, foe takes +12 Hits. If not, he takes +17 Hits and is bleeding at 4 Hits per round, is at -40 and stunned for 10 rounds.
46-50	Glancing shots to foe's upper back. Foe must parry next round at -30. +5 Hits.	Strike to the back. Foe is stunned and unable to parry for 2 rounds. Foe receives 2 Hits per round and +8 Hits.	Strike across foe's back and buttocks — ouch. He takes 2 Hits per round and is stunned for 3 rounds. +13 Hits.	Strikes to lower back paralyze foe's legs. He is down (at -80 to all action) and taking 4 Hits per round.	Multiple back blows send foe flying 10 feet. Unable to parry, foe is stunned for 12 rounds. He takes 6 Hits per round and is at -70. +19 Hits.
51-55	2 strikes to foe's chest. He is knocked back parrying at -20 next round. Foe receives 2 Hits per round and +6 Hits.	Foe hit in chest and side. +10 Hits. He is stunned for 3 rounds and takes 5 Hits per round.	Foe staggers and parries for 3 rounds after receiving minor wounds to the chest and groin. Foe receives 3 Hits per round and +15 Hits.	Major wounds to foe's chest. He is stunned and unable to parry for 3 rounds. He takes 5 Hits per round. +19 Hits.	Foe knocked back with chest strikes. Aorta damage causes 20 Hits per round. Lung lacerations will suffocate foe in 4 rounds. He is prone, meanwhile. +21 Hits.
56-60	2 shots to foe's leg. If armored, +7 Hits. If not, +10 Hits. Foe is stunned for next 3 rounds.	2 strikes to the thigh and 1 to the forearm sadden foe. Foe receives 4 Hits per round and +11 Hits. Foe is stunned 3 rounds and unable to parry. He is at -50.	Foe stunned for 5 rounds by strikes to the calf and thigh of both legs. He is down and taking 5 Hits per round and is at -50. +16 Hits.	You lacerate foe's thigh and shatter a hip joint. He is in a week long coma taking 5 Hits per round. +22 Hits.	Both thighs and groin very severely slashed. Foe takes 10 Hits per round, is down and stunned for 30 rounds. +23 Hits. Embarrassing.
61-65	Hit along weapon arm. Foe receives 2 Hits per round. Foe is stunned next round. +10 Hits.	Blows along forearm and opposite shoulder. Arms less than useless. Foe receives 4 Hits per round and 12 Hits.	Foe drops possessions after being struck in the arms. Foe takes +17 Hits, stunned for 5 rounds, -25 on actions, and bleeds. Receives 6 Hits per round. Give up.	Foe loses hand, and arm is severely mangled. He is unable to parry for 5 rounds and is stunned for 20 rounds. Receives 6 Hits per round. +24 Hits.	You deliver ugly wounds to foe's arms and shoulders. Limbs are useless. Foe is at -60, stunned, and unable to parry for 5 rounds. +25 Hits.
66	Strikes to shoulder/collar area. Foe is stunned for 5 rounds and arm is useless. Activity at -30 and foe receives 4 Hits per round +15 Hits.	Elbow shattered with forearm left dangling. Foe receives 6 Hits per round as foe sees this and passes out. +20 Hits.	You cut foe down at the knees. Foe is immobilized and at -100. Receives 10 Hits per round and foe is stunned for 12 rounds.	The side of foe's head springs 3 leaks. Too late to call a plumber; he's dead. Very gory.	You expose foe's chest cavity, appropriate for pre-med anatomy course. He is dead. +15 to your next action.
67-70	Blow along neck and chest. Foe knocked down and stunned for 4 rounds. Foe receives 4 Hits per round and +17 Hits.	Neck and collar strikes cause 6 Hits per round and +14 Hits. Foe at -20 and stunned for 5 rounds.	Multiple strikes along the upper body. Foe is stunned for 8 rounds and cannot parry for 4 rounds. Receives 2 Hits per round and +20 Hits.	Shoulder smashed. Foe spins back 10 feet. He is stunned and unable to parry for 7 rounds. Arm is useless. Receives 6 Hits per round. +26 Hits.	Muscles and tendons in foe's arm and leg are torn beyond recognition. He takes 12 Hits per round, and is down for 20 rounds. +28 Hits.
71-75	Tendons in both legs are slashed. Foe is at -50 and is taking 4 Hits per round. He is out for 2 rounds and stunned for 5 more. Too bad.	Foe's leg riddled. He is at -50 with 4 Hits per round and also stunned for 5 rounds. +17 Hits.	Leg muscles and tendons slashed by strikes to calf and thigh. Foe stunned and unable to parry for 8 rounds, takes 5 Hits per round, and is at -75. +25 Hits.	Hits in the shin, knee, hip, and side, down foe in a convulsive heap. He is down for 24 rounds and at -90. He takes 8 Hits per round. +27 Hits.	Foe loses both legs to your raging assault. He is in shock, taking 14 Hits per round, and will die anyway in 6 rounds. +30 Hits.
76-80	Foe's left side and arm are perforated. Foe is at -40, stunned and unable to parry for 6 rounds. Foe takes 3 Hits per round and +18 Hits.	Foe's left arm takes multiple lacerations. Receives 3 Hits per round and operates at -40. Foe is stunned next round and cannot parry. +18 Hits.	Blows to both arms and chest break several indigenous bones. Foe is stunned for 12 rounds, takes 8 Hits per round, and is unable to parry. +27 Hits.	Strike destroys foe's weapon and neatly separates his arm from his body. Foe is in shock and prone taking 8 Hits per round. +30 Hits.	Bone splintered from one shoulder to the other. Additional thigh wound. Foe is prone taking 14 Hits per round and equipment is destroyed. +32 Hits.
81-85	Foe pummeled in the side and hip. Immobilized until aided. He takes 6 Hits per round and +20 Hits.	Strikes to the side and abdomen. Foe experiences 9 Hits per round for bleeding. Stunned and unable to parry for 5 rounds before passing out from shock. +21 Hits.	Several side and back wounds cause foe to parry in a stunned state for the next 13 rounds. Foe takes 9 Hits per round and +28 Hits.	Severe blows to foe's side and abdomen. Foe is stunned and unable to parry for 5 rounds. He is taking 10 Hits per round and is at -95. +32 Hits.	Witless loser charges you as you sever his spine, hand, and lacerate the side of his head. He falls in a heap, quite lifeless.
86-90	Hit foe's back and upper leg. He is bloody and knocked 10 feet away. Foe unable to parry for 5 rounds. 6 Hits per round, and +18 Hits.	Strikes blow away ear and pierce hip. Foe at -30, cannot parry for 2 rounds, stunned for 6 rounds, and takes 8 Hits per round. +27 Hits.	Foe knocked down. Strikes kill an unarmed foe. Otherwise, he is stunned, unable to parry for 12 rounds, receiving 9 Hits per round. +30 Hits.	Sent spinning, foe is struck in the spine, the kidneys, and he loses a hand. This one is history in one round. +33 Hits.	Disemboweling stream of metal pummels foe's leg, abdomen, and chest. He lapses into unconsciousness before dying in 4 rounds. +35 Hits.
91-95	Foe loses one ear and nose is lacerated. Hearing at -50. Stunned for 10 rounds if armored or out 3 hours if not. Foe receives 5 Hits per round and +23 Hits.	Impacts to middle and upper back and back of head. If unarmed, foe dies; otherwise, he is stunned for 10 rounds. Takes 8 Hits per round and +25 Hits.	Foe makes an excellent ventilator with holes in the leg, side, and chest. He expires in 1 round. +32 Hits.	Several strikes take out the liver, spleen, and intestines. Poor slob fights for one messy round then drops. +34 Hits.	Spinal shot induces a bizarre twist. Arteries in chest and arm also severed. Foe is paralyzed and dies in 3 rounds. +40 Hits.
96-99	Malicious blow to foe's face. He loses nose, cheekbone, and a part of his skull. Foe is in coma until revived. Receives 4 Hits per round and +25 Hits.	Foe brutalized in strikes to the side, cheek, neck, and brain. Foe dies in 2 prone rounds. Add 10 to your next attack. +35 Hits.	Foe knocked back 15 feet without an arm, and with gashes in the neck. He is paralyzed by a broken spine and dies in 8 rounds. +35 Hits.	A classic example of unanesthetized surgery. You remove a plethora of vital organs. A bit sloppy. Foe is out and dies in 3 rounds. +35 Hits.	A steady stream nails the sucker in brain, neck, heart, abdomen, and groin. Your allies within 50 feet add +10 to their next attacks. You are out of ammunition.
100	Hip is destroyed. More importantly, the head is messily separated from the shoulders. Bye.	Poor sucker is without the lower half of his body and has a hole where his eye was to boot. It was quick.	foe takes strikes to the chest, and face. Lungs fill with blood, making breathing difficult. Poor fool expires in 3 messy rounds.	Foe hit in the heart and brain for a prompt demise. Good shot. Add +20 to your next attack.	Foe bursts into a bloody pulp. Stop wasting ammunition.

5.86 IMPACT	"A"	"B"	"C"	"D"	"E"
01-05	Nary a whisper. +0 hits.	Great luck escapes you. No additional damage. +0.	+1 hit.	+2 hits. Pretty weak.	+3 hits.
06-10	+1 hit.	+2 hits	+3 hits.	+4 hits.	Blast stuns foe for 1 round. +3 hits.
11-15	Foe loses initiative for 1 round. +2 hits.	Foe is spun about. +4 hits. Foe loses initiative 1 round.	Foe is unbalanced. +3 hits and foe must parry 1 round.	Foe is unbalanced. +4 hits and foe must parry 1 round.	Blast stuns foe for 1 round. +4 hits.
16-20	Foe is spun about. +3 hits. Foe loses initiative 1 round.	Blast unbalances foe. +2 hits and foe must parry 1 round.	Foe is unbalanced. +4 hits and foe must parry 1 round.	Blast unbalances foe. +6 hits and foe must parry 1 round.	Foe stunned for 1 round. +9 hits.
21-35	Foe is unbalanced, takes +5 hits, and loses 2 rounds of initiative.	Blow unbalances foe. +5 hits and foe must parry 1 round.	Foe is unbalanced. +8 hits and foe must parry 1 round.	Foe is unbalanced. +10 hits and foe must parry 1 round.	Foe reels from blast. +15 hits and foe is stunned for 1 round.
36-45	Foe is unbalanced. +8 hits. Foe loses 2 rounds of initiative.	Foe unbalanced by blast. +9 hits and foe must parry next round.	Foe is unbalanced. +10 hits and he is stunned for 1 round.	Foe is unbalanced and must parry for 2 rounds. +12 hits.	Foe is spun about and reels backwards 10 feet. +20 hits. Foe is stunned 2 rounds.
46-50	Blow unbalances foe. +10 hits. Foe loses 3 rounds of initiative. Getting better.	Blow unbalances foe. +10 hits and foe is stunned next round.	Foe is unbalanced and must parry for 2 rounds. +12 hits. Add 5 to your next action.	Foe is spun about. +20 hits. Foe is stunned 2 rounds.	Foe is staggered. +20 hits and foe is stunned and unable to parry 1 round.
51-55	Blow unbalances foe. +10 hits. Foe is stunned for 1 round. Grazing blast.	Blow unbalances foe. +12 hits and foe is stunned next round.	Foe is knocked back 5 feet and must parry for the next 2 rounds. +15 hits.	Foe is knocked back 5 feet and must parry for the next 2 rounds. Add 5 to your next action.	Foe is really staggered. +20 hits. Foe is stunned 2 rounds and unable to parry next round.
56-60	Foe is unbalanced. +10 hits. Foe is stunned next round.	Foe is spun about. +10 hits and foe is stunned for 2 rounds.	Foe is spun about +12 hits and foe is stunned for 2 rounds.	Foe is staggered as he takes 10 hits. Foe is stunned and unable to parry for 1 round.	Foe is knocked down. +20 hits. Foe is out of action for 2 rounds.
61-65	Foe is unbalanced. +12 hits. Foe is stunned during next round.	Foe is staggered. Poor fool is stunned and unable to parry next round. +10 hits.	Foe is stunned and unable to parry next round. +10 hits. Add 5 to your next action.	Foe is staggered. +10 hits. Foe is stunned 2 rounds and unable to parry for next round.	Foe is knocked down. +20 hits. Foe is out of action for 3 rounds.
66	Blast break's foe's non-weapon shoulder. Arm is useless. +20 hits. Foe must parry for 1 round. +7 hits.	Blow shatters foe's weapon shoulder. +15 hits. Arm is useless. Foe is stunned 1 round.	Blow breaks both of foe's arms. Foe is knocked down, is at -90, and is stunned for 3 rounds.	Blow to foe's head. If foe has no helmet you kill him. If foe has a helmet he is out for 3 hours, but faceplate is cracked with slow leak.	Blast shatters skull into thousands of lost particles. Foe dies instantly. Direct hit; fine punch.
67-70	Blow to foe's back. Foe is stunned and unable to parry for 1 round. +7 hits.	Blow to foe's back. Foe is stunned and unable to parry next round. +12 hits.	Blow to foe's back. Foe is stunned for 2 rounds and unable to parry next round.	Foe is knocked down, takes 15 hits and is out of action for 2 rounds. Add 5 to your next act.	Blast to foe's non-weapon arm. Foe is stunned 1 round and has a shattered shoulder.
71-75	Blow unbalances foe. +10 hits and foe is stunned for 2 rounds. Strong grazing blast.	Blow stuns foe for 2 rounds. +20 hits. Foe is unable to parry next round.	Foe is knocked down. +10 hits. Foe is out of action for 2 rounds. Add 5 to your next act.	Foe now has a broken non-weapon arm. +10 hits. Foe loses use of arm, is stunned 1 round.	Blast to foe's chest breaks ribs and stuns foe for 6 rounds. +20 hits. Foe at -25.
76-80	Blow stuns foe for 2 rounds. +15 hits. Foe is unable to parry for 1 round.	Foe is knocked down. +10 hits. Foe is out of action for 2 rounds. Add 5 to your next act.	Blow breaks foe's collar bone. Foe is at -25. Break is minor. +15 hits. Foe is stunned 1 round.	Blow breaks foe's weapon arm. +10 hits. Arm is useless. Foe is stunned for 1 round.	Blistering blast to foe's shoulder area breaks collar bone and both shoulders. Foe's arms are useless. +25 hits.
81-85	Blow to foe's back. +10 hits. Foe has broken ribs and torn cartilage, fights at -25.	Blow to foe's back tears cartilage, breaks ribs. +10 hits. Foe is stunned for 2 rounds, fights -25.	Foe has broken thigh. +15 hits. Foe fights at -40 and is stunned for 3 rounds.	Blow breaks both of foe's arms and knocks foe down. +20 hits. Foe is down for 3 rounds, has 2 useless arms.	Blast to side crushes a variety of organs. Foe dies of internal bleeding after 6 rounds of inactivity. +30 hits.
86-90	Blow knocks foe down. +10 hits. Foe is down for 3 rounds and is unable to parry.	Strike to foe's calf. +20 hits. Foe fights at -50 due to broken bone and torn tendons. Foe is stunned 3 rounds.	Blow breaks foe's hip. +20 hits. Foe fights at -60 and is stunned and unable to parry for 2 rounds.	Strike to foe's abdomen. +20 hits. If area not armored, foe dies in 6 rounds due to organ loss. If armored, foe stunned 12 rounds.	Blast crushes bone in foe's lower body. Foe finds life hard and dies in 3 rounds. +50 hits.
91-95	Blow breaks foe's hip. Foe fights at -50. +20 hits. Foe is stunned and unable to parry for 3 rounds.	Blow to upper head area. If foe has no helmet he is dead. Otherwise, foe is in a coma for 2 weeks. +25 hits. Helmet broken and useless.	Blow shatters foe's knee. Foe is hobbled and is at -75. +20 hits. Foe is stunned and unable to parry for 9 rounds.	Blow shatters foe's jaw. Foe's brain is destroyed. +50 hits. Foe dies after 3 rounds of inactivity.	Blast drives bone through foe's lungs. Foe drops and dies after 6 rounds of intense agony. Sad. +30 hits.
96-99	Blast to foe's head. +20 hits. If foe has no helmet, he is knocked out and in a coma for 1 month. If foe has helmet he is knocked out for 1 day.	Blast to foe's collar area severs windpipe. Foe cannot breathe or fight. +25 hits. Foe dies in 12 long rounds.	Blast to foe's chest. Foe dies immediately after sudden shock. +50 hits.	Blow to foe's side. +25 hits. Bone is driven into foe's kidneys and foe dies of shock in 1 round.	Blast crushes skull. Foe dies immediately. Add 20 to your next action.
100	Head strike. +25 hits. If foe has helmet, it is broken and foe is knocked down and out for 1 day. If no helmet, foe dies due to the skull fracture in 3 rounds.	Blow to back of neck paralyzes foe from the shoulders down. +30 hits. Foe is unhappy.	Blast to foe's head crushes skull. Foe dies immediately. Add 10 to your next action.	Chest disruption. Foe's lungs and heart explode. Foe dies instantly. Add 25 to your next action.	Blast annihilates foe's entire skeleton. Foe is reduced to a gelatinous pulp. Try a spatula.

	5.87 ELECTROCUTION	5.88 RADIATION	5.89 VACUUM	5.91 WEAPONS FUMBLE
-49-05	Hair stands up. +0 hits.	Warm glow gives you a tan. +0 hits.	Ears pop. +0 hits.	Lose your grip. No further activity this round.
06-20	Light charge. +3 hits.	Mild rays. If untreated, 50% chance of cancer in a year.	Rushing air delivers 5 hits.	One's ten thumbs just cannot locate that elusive trigger. No further activity this round.
21-35	Explosion of light. Target stunned 1 round.	Insidious exposure delivers 5 hits, unhealable until specially treated.	Staggered by airburst. +10 hits.	The safety was on. -50 to activity for this round and the next trying to recover. Boy, do you look silly.
36-50	Medium charge. +6 hits; -10 to activity.	Rays deliver a mild burn: 2 hits per round and -10 to activity.	Gale winds spin target about; he reels backwards 10 feet. +12 hits. If no armor: stunned 2 rounds.	Fumble your quick-draw lose your cool. You find yourself at -30 activity for 3 rounds of action.
51-65	Heavy charge. +9 hits; -20 to activity and stunned 1 round.	Bitter chromosome damage: you are O.K. but your children have a 50% chance of being 'damaged'. Also affects Regenex treatments.	Ears really pop: mild hearing damage and +8 hits, also stunned 2 rounds.	You drop your gun and you're stunned this round and next trying to decide whether to retrieve it or use a new one.
66-79	Strike to left arm. +12 hits; -30 to activity.	Target irradiated: hair falls out in one day; sores appear delivering 10 hits and 1 per round. Hits can be 'healed' but per round problem cannot be stopped until radiation treatment done.	Blast sends target whirling: +10 hits. Left arm is broken and useless; he is stunned 3 rounds.	You really mishandle your weapon. Stunned 2 rounds.
80	Strike to side devastates nervous system. Severe shock results. Victim is a living vegetable for 10 days.	Target looks at source: severe retinal damage causes permanent blindness. +20 Hits.	Victim knocked down and is struck on the head. +12 hits. Helmet is crushed and useless, he is stunned 5 rounds. If no helmet: skull fractured, dies in 3 rounds.	Poor judgment, and worse aim. You pull the trigger, lose an ear and take 2 hits per round.
81-86	Strike to right arm: Muscle and cartilage mangled. Arm useless. 2 hits per round. Item in hand shorted out. Target is stunned 6 rounds.	Target gets radiation sickness: nausea, hair loss and sores. -40 to all activity and constant 30 hits until treatment administered. Death in 30 days if not treated.	Cold and air loss take victim's breath away: he is stunned 3 rounds and takes +15 hits.	The ammunition cartridge is jammed. It will take 2 rounds to draw a new weapon or 6 rounds wrestle it free.
87-89	Victim is permeated by electricity. Entire nervous system rearranged. Drops and lies in shock for 10 hours before dying.	Exposure causes target to faint for 1-10 minutes. Severe radiation sickness puts poor victim at -70 to activity (including perception due to retinal damage). Death in 10 days if not treated.	Flying debris stuns target for 3 rounds. +20 hits.	Fumble ammunition when loading. Your precious ammo skitters 10 feet away. Now what, buddy?
90	Head strike. If target is wearing a helmet: it is destroyed and a 2 week coma results. If not: dies instantly as brain is fried.	Severe exposure: "B" heat critical and target in coma. Death in 2 days.	Luckily, victim is lodged between pipes within 10' of a door to safety, avoiding an unpleasant space walk. Unluckily, his spine was damaged and he is paralyzed from the waist down. +25 hits.	Only you could get your finger caught in the trigger. You are stunned for 4 rounds of action. Try surrendering.
91-96	Chest strike. If metal armor: it becomes fused and immobile. If not: unlucky target is knocked out for 6 hours.	Deadly rays course through target: "A" heat critical and target is stunned 5 rounds. After ten minutes victim is struck by severe nausea lasting 1-10 days. Temp constitution drops 2-20 points.	Victim hears bells: eardrums burst and hearing permanently damaged. Nose bleeds. He takes 18 hits and 3 per round. -50 to activity as eyes water and lungs burn.	Your spastic aim hits 20 feet short of target. You are at -30 activity for 3 rounds.
97-99	Electrifying experience: victim's brain falls victim to massive shock. Passes out and dies in 6 rounds.	Target zapped: he is blind and stunned for 10 rounds, after which he lapses into unconsciousness for one day. Then 50% chance of death or merely life with a Permanent Con reduced by 5-50 points.	Decompression collapses one lung and destroys hearing. Target at -70; +24 hits. and he is stunned 3 rounds.	You seem to think that your gun is a baton. It slips and in trying to recover it, you knock it 5 feet in front of you.
100	Nervous system acts as a superconductor. Sad instant death provides all witnesses with a fine light show.	Rays flash-fry target's skin: +40 hits and 10 per round. Victim is blind and unconscious, and will die in 5 minutes.	Target feels blood start to boil: +30 hits and 10 per round while exposed. He is stunned for 6 rounds.	Your gun slips in your sweaty palm as you fire. You shoot off your toe. Now you're at -50 and took +8 hits. 2 hits per round.
101-106	Strike to face: victim loses nose and is stunned 8 rounds. Blinded for 2 weeks. If wearing a helmet: lucky target is only knocked down.	Penetrating waves do no initial damage, but three of target's internal organs will fail in 1-10 days. (roll each). Permanent Con reduced 4-40 points.	Explosive decompression slams target against bulkhead, and he is lacerated by crystallizing atmosphere: +15 hits, 4 per round and stunned 3 rounds.	Cartridge drops out of your weapon, scattering ammo, on which you slip and fall down. Stunned 5 rounds (and red-faced).
107-109	Chest strike: If target wearing metal chest armor it is a single fused mass; he is frightened and stunned 3 rounds but otherwise OK. If not: heart and lungs destroyed: he dies instantly.	Unpleasant burns: target receives a "C" heat critical and will die in 10 hours if not treated.	Large piece of equipment is torn loose and slams into victim's side: bone is driven into kidneys. He takes 30 hits and is stunned for 10 rounds, then he dies.	Poke yourself in the eye while trying to get fancy. +8 hits. -20 to activity and stunned 2 rounds.
110	Head is no longer available for use. Smoke and ozone surround the lifeless body.	Victim feels microwaved as his blood boils: +50 hits and knocked unconscious. Poor fool dies in 3 rounds due to massive internal damage.	Lack of air pressure disrupts lungs, eyes and ears. Not a pretty sight. Target dies in 6 messy rounds.	You pull the trigger and empty the gun into your own foot. +20 hits; 8 hits per round. -70 to activity. Stunned 3 rounds.
111-116	Abdomen strike. Stunned 7 rounds. 6 hits per round. If no armor over abdomen: dies of shock and bleeding in 12 rounds.	Target collapses. Widespread cellular damage causes 60 hits and coma; death in 10 days.	Target spun by departing air, and knocked down. He breaks both arms. -60 to activity and stunned 3 rounds, during which he slides towards the new exit.	Trigger slips while you are bringing up your weapon. Make an attack with no modifications on the closest combatant.
117-119	Chest strike destroys both lungs. Cut in half. Charge extends 10 feet giving an "A" critical to anyone in the way.	Selective rays vaporize eye tissues: victim is stunned for 10 rounds, takes 20 hits and is quite blind.	Victim unwittingly attempts to turn inside-out. Though unsuccessful (sort of) he loses use of all sensory organs as well as lungs, and tumbles, unconscious, towards deep space, exiting in one round. +50 hits.	While daydreaming you put your hand in front of the barrel while firing. Lose a finger. +10 hits; 5 hits per round and stunned 3 rounds.
120	Charge disrupts cell structure as electricity permeates body in beautiful display before turning it to dust.	Target glows a pretty shade of red before vanishing utterly.	Wasting no time, target zips straight out of hull breach. Surrounded by a cloud of frozen oxygen, he explores the final frontier on his own. Unfortunately, he is quite dead after 2 rounds. Wave g'bye.	You spin the weapon in your hand and deal a point-blank burst attack on yourself. Roll the attack and say your prayers, buddy.
	-20 — "A" crit -10 — "B" crit +0 — "C" crit +10 — "D" crit +20 — "E" crit	-20 — "A" crit -10 — "B" crit +0 — "C" crit +10 — "D" crit +20 — "E" crit	-20 — "A" crit -10 — "B" crit +0 — "C" crit +10 — "D" crit +20 — "E" crit	-20 — Hand Energy -10 — Energy Pistol +0 — Two-handed Energy +10 — Pistol Projectile +20 — Two-handed Projectile

PERSONAL MANEUVER CHART									
	Routine	Easy	Light	Medium	Hard	Very Hard	Extremely Hard	Sheer Folly	Absurd
-201	Fall down. +2 Hits. You are out 3 rounds.	Fall. Knock self out. You are out for 12 rounds. +9 Hits.	Fall. Break arms. +10 Hits. You are out for 6 rounds.	Fall. +15 Hits. Break arm. You are out for 9 rounds.	Fall. Break arms. +20 Hits. You are out 18 rounds. Arms useless.	Fall. Break both arms and neck. +30 Hits. You are out 60 rounds.	Fall sends you into a coma for 3 years. +30 Hits. Broken spine.	Fall breaks neck. You die in 3 rounds.	Fall crushes skull.
(-200) — (-151)	Fall to act.	Fall down. Lose 2 rounds. +2 Hits.	Fall down. +3 Hits. You are out for 4 rounds.	Fall. Break wrist. +10 Hits. You are out for 6 rounds.	Fall. Break leg. +15 Hits. You are out 9 rounds.	Fall. Break arms. +20 Hits. You are out 18 rounds. Arms useless.	Fall. Break back and legs. +25 Hits. Paralysis of lower body.	Fall. You smash your backbone and are in a coma for 1 year.	Fall paralyzes you from neck down.
(-150) — (-101)	10	Fall to act.	Fall down. +2 Hits. You are out for 2 rounds.	Fall down. Sprain ankle. You are at .75%. +6 Hits.	Fall. Break arm. +10 Hits. You are out 6 rounds. Stunned 3 rounds.	Fall. Break leg. +15 Hits. You are out for 6 rounds.	Fall. +30 Hits. You are out 6 rounds. Shatter knee. You are at .80%.	Fall. Break both arms and neck. +30 Hits. You are out 60 rounds.	Fall. You smash your backbone and are in a coma for 1 year.
(-100) — (-51)	30	10	Fall to act.	Fall down. Lose 2 rounds. +3 Hits.	Fall down. Sprain ankle. You are at .75%. +5 Hits.	Fall. +20 Hits. You break your wrist. You are out 2 rounds. Not very smooth.	Fall. +12 Hits. Break arm. You are out for 6 rounds.	Fall. +30 Hits. You are out 9 rounds. Shatter knee. You are at .80%.	Fall. Break back and legs. +25 Hits. Paralysis of lower body.
(-50) — (-26)	50	30	10	Fall to act.	Fall down. +5 Hits. You are out 3 rounds.	Fall. Sprain ankle and tear ligament. You are at .30%. +15 Hits.	Fall. +10 Hits. Knock yourself out. You are out for 18 rounds. You lose pool.	Fall. +12 Hits. Break arm. You are out for 6 rounds.	Fall. You are out 18 rounds. You break both arms. +25 Hits.
(-25) — 0	70	50	30	5	Fall to act.	Fall down. +5 Hits. You are out of action for 3 rounds.	Fall. Sprain ankle and tear muscle. You are at .30%. +10 Hits.	Fall. +20 Hits. You break your wrist. You are out 2 rounds. Not very smooth.	Fall. +10 Hits. You break your leg. You are at .75%. You are out 6 rounds.
01 — 20	80	60	50	10	5	Fall to act.	Fall down. +5 Hits. You are out for 3 rounds.	Fall. +5 Hits. You pull a leg muscle. You are at .25%. You are out 2 rounds.	Fall. +15 Hits. Break arm. You are out for 6 rounds.
21 — 40	90	70	60	20	10	5	Fall to act.	Fall down. +7 Hits. You take 3 hits per round. You are out for 2 rounds.	Fall. Knock yourself out. You are out for 30 rounds. +10 Hits.
41 — 55	100	80	70	30	20	10	5	Fall down. +5 Hits. You are out for 3 rounds.	Fall. Sprain ankle and tear ligament. You are at .30%. +15 Hits.
56 — 65	100	90	80	40	30	20	10	Fall to act.	Fall down. +7 Hits. You take 3 hits per round. You are out for 2 rounds.
66 — 75	100	100	90	50	40	30	20	5	Freezes for 2 rounds.
76 — 85	100	100	100	60	50	40	30	10	Fall to act.
86 — 95	100	100	100	70	60	50	40	20	5
96 — 105	110	100	100	80	70	60	50	25	10
106 — 115	110	110	100	90	80	70	60	30	20
116 — 125	120	110	110	100	90	80	70	40	30
126 — 135	120	120	110	100	100	90	80	50	40
136 — 145	130	120	120	110	100	100	90	60	50
146 — 155	130	130	120	120	110	100	100	70	60
156 — 165	140	130	120	120	120	110	100	80	70
166 — 185	140	140	130		Excellent move. You are great. Subtract 4 hits from your current total.	120	110	90	80
186 — 225	150	140	Great move. You feel better. Subtract 4 hits from current total.	Brilliant. Move inspires all. You are unstunned. Your allies are at +10% for 2 rounds.	Move inspires your allies. Add 20 to friendly rolls for 3 rounds.	Move inspires your allies. Add 30 to friendly rolls for 2 rounds.	120	100	90
226 — 275	150	Incredible move. You feel great. Subtract 3 from your current hit total.	Brilliant. Move inspires all. You are unstunned. Your allies are at +10% for 2 rounds.	Move inspires your allies. Add 25 to friendly rolls for 3 rounds.	Move inspires your allies. Add 30 to friendly rolls for 3 rounds.	Move inspires your allies. Add 30 to friendly rolls for 4 rounds.	You have half the round to act.	100	100
276+	Incredible move. You feel great. Subtract 3 from your current hit total.	Brilliant. Move inspires all. Your allies are at +10% for 2 rounds.	Move inspires your allies. Add 20 to friendly rolls for 3 rounds.	Move inspires your allies. Add 25 to friendly rolls for 3 rounds.	Move inspires your allies. Add 30 to friendly rolls for 3 rounds.	Move inspires your allies. Add 30 to friendly rolls for 6 rounds.	Move stuns all foes within 30 feet. You still have half the round to act.	Move stuns all foes within 50 feet.	

6.0 VEHICULAR COMBAT

Presented below is a ship-to-ship combat system usable for any two or more vehicles capable of high-speed N-space maneuvering. By necessity, all ship combat takes place in normal space, mainly because any sort of discreet maneuvering while in Hyperspace inevitably leads to a random displacement, sending the ship far off course. Also, energy weapons are useless in hyperspace, as the ship they are intended to strike is moving many times their rate. These rules are also most suited for combat between relatively large ships (at least 1,000 tons) with sophisticated offensive and defensive systems. The velocities involved are large, and thus so are the distances between the ships. Virtually all such combat takes place with neither craft ever getting within normal visual range of the other.

However, with the incredibly advanced sensing, targeting and magnification technologies available to the spacecraft of the future, the opponent's ship still looms huge on a viewing screen as it fires computer-tracker lasers or antimatter torpedoes.

As has been mentioned, the starship-mounted weapons of **Space Master** require many support facilities in order to be effective. These are detailed in section 6.13. The weapons themselves (including their various advantages and disadvantages) are discussed below, in section 6.12. Immediately following are several terms used frequently in this section which bear clarification at the onset. Any other terms which might be unclear are in the Glossary.

For combat involving much smaller craft (Such as SMAC fighters in a dogfight situation, or SMACs attacking a larger craft), see the Small Spacecraft Combat conventions, section 6.43).

6.11 DEFINITIONS

AR: (Acceleration Rating): the rate of change of speed a given ship is capable of.

CPU: (Central Processing Unit): the main processor of a computer. In **Space Master** the Mk. number of a computer is equal to its processing unit capacity. Since most programs require more than one Processing Unit each, probably substantially fewer programs than units can be run simultaneously.

HUD: (Heads Up Display): Applicable to gunner bonuses, a HUD is a small visual readout screen or other display which shows targeting data and other relevant information to the gunner. HUD's have differing bonuses based on their quality and sophistication.

6.12 SHIP MOUNTED WEAPONRY

There is a substantial array of ship mounted weapons available in **Space Master**, differing in complexity, power and effect. The general types of offensive weaponry are described below, grouped by what type of critical they deliver (Pierce or Blast). Energy weapons all fire some sort of projectile which travels at essentially the speed of light. Failure for such weapons usually indicates either a gunner fumble or an electronic or capacitance breakdown. All missiles and torpedoes are fired from magazines via a tube. Failure for these weapons is usually either a mechanical breakdown, or a premature detonation as the missile (being fired at hyperlight speeds) is struck by a bit of space debris and destroyed — always a calculated risk in ship combat.

WEAPONS DELIVERING A PIERCE CRITICAL

Laser Cannon: Potentially the most complex of all the weapons systems, laser cannon banks are also — perhaps quixotically — the most compact. Laser banks fail on an unmodified roll of 01-07, the largest failure range, due to their sophistication and delicate targeting mechanisms (but only for spacecraft mounted LASERS when used in spacecraft combat). Though laser cannon do not deliver may pure hits, their critical severity range is very high: an "I" (a combination critical — see the attack chart). A powerful laser is potentially the most devastating weapon against any craft.

Blast Cannon: A particle beam weapon, the Blast Cannon acts to break down the molecular structure of the target. The effect is essentially of a beam weapon, though it is slightly less accurate and powerful than a laser. Though more bulky than a laser bank or disruptors, the machinery is less susceptible to damage or misalignment.

Disruptor Bank: Pulses of oscillating electromagnetic radiation which disintegrating anything in their path, Disruptors are very effective against unshielded material. Disruptors are more bulky than Laser Cannon but less so than Blasters.

Ion Cannon: The Ion Cannon fires a series of ionized energy bolts in phased rapid-fire. Though the bolts are actually a series of small blast strikes, the effect is that of a pulsed beam, thus the Pierce critical is used. The Ion Cannon is the most simple mechanically. The Ion Cannon uses the Blaster table with Pierce criticals.

Non-explosive Projectile: Rarely used against any but the smallest ships, non-explosive projectiles are included mainly for completeness. Some ships do still mount these weapons, usually in rapid-fire gun mounts, so the Pierce effect is sometimes almost that of a slashing beam. The loading and firing machinery malfunctions on a roll of 01-03.

WEAPONS DELIVERING A BLAST CRITICAL

Matter/Antimatter Torpedo: The most powerful of the guided missile weapons, M/A torpedoes are canisters with a self-contained electromagnetic field holding separated small amounts of matter and antimatter. The torpedoes detonate automatically on proximity. M/A torpedo launchers fail on an unmodified roll of 01-04.

Thermonuclear Missile: Though bulkier and less powerful in pure destructive energy than M/A torps, Nuclear missiles do, however, deliver a Radiation critical. These missile launchers fail on a roll of 01-04.

Explosive Missile: These relatively ineffective missiles are commonly only used by low-technology societies or against undefended targets. At short range they can be devastating since they have no guidance systems to fool. They fail on a roll of 01-04.

Plasma Gun: The most devastating weapon in terms of pure delivery of concussion hits, the Gun fires a bolt of energy plasma which expands and encloses the target, forcing an implosion. The weapon is a tremendous drain on a ship's energy, but the results are often worth it. The mechanism is roughly three times the size of Laser equipment.

6.13 SYSTEMS IMPORTANT TO COMBAT

SENSORS

Sensors are crucial to combat not only for analysis of opponent's actions, but simply to know what the opponent is doing instantly. Keeping in mind that all visual data travels at the speed of light, any normal input as to what an opponent is doing is subject to the delays of light speed. Sensors (or SENSR scans, as they are properly known — see section 2.0) gather data at hyperlight speeds, and thus allow for computer updates on enemy movements.

SHIELDS

An integral part of ship defense in **Space Master** are Deflector shields (or screens as they are sometimes called). Generated from a single source, the shields are distributed over a ship's hull using a superconductor grid implanted in the hull's outer surface. These shields absorb or deflect most forms of energy, spreading it over the surface of the ship and thus dispersing it. Strong bombardments temporarily weaken shield power, as reflected in the critical strikes which indicate a temporary lowering of shield DB.

One special feature of shields is that (with the appropriate Defense program) they can be doubled over a certain area of the ship. The

areas are: front, rear, side, top or bottom. See the diagram on the Combat Status Chart (sec. 6.16) for what facings are actually covered. When shielding is doubled for a facing, the Shield DB is literally doubled. However, the rest of the ship facings have no shield protection. Special shield facings are selected if desired at the beginning of each turn and are locked in for the duration of the turn.

COMPUTER PROGRAMS

Computer programs are dealt with extensively in section 3.2, and that section should be studied for all applicable computer programs for combat. Here are reviewed briefly the key programs and what purpose they serve.

Defense: Evade (DB bonus); EW Distribution; Defense (screen control).

Offense: Tactics (Initiative bonus); EW Distribution; Target Lock-on (Energy weapons); Central Gunner Control (if individual gunners not used); Gunner Interface (if gunners used); Predict (energy weapons); Missile Targeting (missiles, torpedoes).

Miscellaneous: These other programs are necessary to normal operation: Basic Systems Monitoring; Life Support; Power Distribution; Damage Control. Construct Analysis, for Sensors, is also necessary if detailed information on the opponent is desired from scans during combat. Also, if repairs are being made, the Technical Reference programs may need to be called up.

The desired programs (assuming they have been purchased and fed into ship memory) should be loaded into the computer CPU prior to battle. Keep in mind that the Computer Mk. # is equal to the number of Processing Units it can have running simultaneously in its CPU.

STEALTH / ELECTRONIC WARFARE

Stealth Systems, also known as Electronic Warfare (EW) systems have many uses on the ship, and to be fully utilized require a full-time operator during battle. A ship's EW rating can be used as a DB, (or to cancel an opponent's EW-caused DB) or can jam (and detonate) incoming missiles. The primary EW operator (person with highest EW skill at a console) must declare (or secretly write down) where he will allocate EW for that turn: DB, Anti-DB, Transmission Jamming or Missile Jamming. The total EW number can be split, but the decision made at the beginning of the turn is locked in until the next turn.

EXAMPLE: Duncan is the EW operator of his ship, the **Defiant**. He has an EW skill of 50, and the **Defiant's** EW rating is also 50. The Sensor officer detects a ship closing, possibly hostile. Duncan activates the **Defiant's** EW screens and ponders how to allocate points. The sensor officer announces that he can only detect Laser Cannons as the incoming ship's armament, so Duncan sets the EW on full DB, since he is defensively minded, and there is no evidence that the other ship has missile armament. He is committed for the game turn. A round later as the ship closes and the Sensor Officer gets another roll, he detects missile tubes! Too bad, since Duncan cannot reallocate some of the ship's EW points until next turn. If he had known, he might have devoted some EW to missile jamming, and had a better chance of stopping the potentially devastating missile attack, sure to come from the opponent.

EW Missile Jamming

With missile jamming, the EW bonus is used as an attack against an incoming missile — the missile receiving a bonus against this EW equal to its Mk. rating. More than one missile can be acted upon in a given round, but there must either be multiple operators or the operator's skill bonus must be split. Note that missile jamming is the only time that the EW operator skill bonus is employed in combat.

EXAMPLE: The **Defiant** has been under attack, the enemy firing laser cannon, which have been ineffective till now. It is the beginning of turn two and Duncan may reallocate his EW, based on the new Sensor data. The **Defiant** has an EW rating of 50. Duncan, with an EW skill bonus of 50, has a number of options:

Option 1: He can ignore the threat of missiles and hold his full EW as a subtraction to his DB, as he has been. Flaws in this idea are that if the enemy fires missiles, they will almost certainly reach their target, and his EW-DB might already be partially annulled by the **attacker's** EW — if they are using theirs to thwart his.

Option 2: Use his full EW on missile jamming, giving himself a good chance of destroying any that are fired. This, however, reduces the ship DB by 50.

Option 3: He can allocate part of the EW rating to each: for instance 20 to overall DB, and 30 to missile jamming. He decides to do Option 3.

The opponent launches two Mk. 20 missiles at **The Defiant**. With two incoming missiles, and Duncan as the only EW operator, he has two choices: 1) split his EW and try to stop both. With this option, he would need to roll 66 or above to jam each (half his bonus of 50: 25, plus EW committed to jamming: 30 (note full jamming EW is used against each missile, while the operator skill must be split), minus the missile Mk. of 20 equals 35. He adds his roll, and the total must exceed 100. A separate roll is made for each missile. 2) Use all of his EW against one missile and have a better chance of destroying one. In this case he adds his full EW: 50 plus the allocated ship EW: 30, minus the missile Mk. of 20. He must roll a 41 or better.

Note that if there were two operators (and consoles), each operator could devote his full EW skill rating and the ship's full (allocated) EW rating against a missile. Missile strike results are determined at the end of the round, after all jamming attempts are made.

EW Cloaking/Stealth

This function cannot be used simultaneously with any other function. Cloaking thwarts enemy sensor detection/analysis. It is not very effective during combat, since overt use of weapons and sublight engines are easily picked up on sensors and the 'cloak' is useless. It is useful just before combat in attempting to ambush an unsuspecting opponent. In this case, the Stealthy ship's EW operator adds his EW skill bonus and the ship's EW, and rolls. The 'victim' ship is allowed a routine sensor roll, adding the ship sensor bonus, the operator bonus, and any others applicable on the Sensor Table in Section 5. If the Stealthy ship's modified roll is 100 over the victim's roll, it is undetected. Less than 100 but still more than the victim indicates inconclusive data; a roll of less than the victim indicates full detection and ship analysis. Once a ship is picked up on sensors, rolls are made every turn, but the stealthy ship must roll a modified differential of over 200 to 'vanish' again, after a sensor lock has been established.

EW Defensive Bonus

Ship's DB is increased by a factor equal to the amount of available EW designated to it.

EW Anti-Defensive Bonus

This function can be used to cancel an opponent's DB created by that opponent's EW only. EW anti-defensive bonus cannot be used to cancel other ship DB factors such as shields or Evade. For example, say the **Defiant** has 20 points of its EW designated for DB, the rest reserved for missile jamming. The **Defiant's** attacker uses 50 points of their EW rating in an attempt to cancel the **Defiant's** EW-DB, but only effectively cancels 20 points, because that is all that was designated.

EW Transmission Jamming

EW can also jam other ships' (and, necessarily, their own) transmissions by creating a large radius interference field, the generating ship at the center. Radius and intensity vary according to points designated. Each point adds 1 LS to the radius, and subtracts 1 from a Comm Tech's attempted transmission roll. All ships within the radius are affected both for incoming and outgoing transmissions.

6.14 COMBAT CONVENTIONS

Combat will take place on the star grid, each hex representing 100 kilometers.

Because space is in three dimensions (no joke!), there is an 'altitude' factor, represented by the space occupied by the altitude counter on the Combat Status Chart (6.16). The number represents the # of hexes of altitude a ship has gained. Negative altitude is also of course possible. Changes in altitude are made by executing turns the same as in the map plane.

Because there is no friction and very little gravity in deep interplanetary space to slow a spacecraft down, once a ship is given an initial thrust it would theoretically continue at that same velocity forever. (One or another of Newton's Laws). This is rather straightforward. However, when a craft is moving at very high speeds, a number of sticky, complex things (related to relativity) begin to occur. Things like time dilation and mass-to-energy ratio shifts. Fortunately, however, the RIF (Relative Inertial Field) generator was invented. In effect, the RIF generator nullifies the effects of Relativity within the ship's field — much like a gravitic field is able to nullify gravity.

However, RIF generator notwithstanding, velocity is constant until thrust (or some other force) is applied to cancel it. Acceleration is constant as long as thrust is applied — until a ship reaches the speed of light. This velocity is the great threshold into hyperspace. If one is deliberately *shunting* with a set course, all fine and good; but if a ship strays over the line it will *randomly* enter hyperspace. A truly terrifying concept. See Ship maneuvering, section 6.1 for the grim consequences. (This should almost never happen during actual combat, since the velocities are relatively small).

As noted in the weapons section above, Energy Weapons generally travel at the speed of light; they therefore are greatly enhanced by a ship *Predict* program, so that the attack may will extrapolate to the ship's new position and fire appropriately. Missiles have their own 'disposable' RIF generators, enabling them to travel at hyperlight speeds.

All combat proceeds as a succession of game *Turns*, each turn lasting one minute. Within each turn are six *Rounds*, each lasting ten seconds (the standard **Space Master** and **Rolemaster** round) and these rounds have phases. The Gamesmaster is advised to initiate turn sequence as soon as one ship detects another and adhere strictly to it to maintain fairness of play.

6.15 COMBAT SEQUENCE

At the beginning of each turn four things are established:

- Initiative determination
- General power allocation
- Shield distribution
- EW allocation.

Initiative is determined for the turn with a roll, modified by the following factors:

Initiative Determination:

- a) N-Space Acceleration Rating of the ship (the actual maximum potential acceleration, in km/rnd squared. See the Movement Chart).
- b) Computer Tactics Program rating bonus (if in use).
- c) N-Space Combat skill bonus of Pilot.

- d) EW Generated by the ship (irregardless of allocation — whether for defense, jamming or whatever, the total EW rating is still used).
- e) Highest Single Heavy Energy Projector Gunner skill bonus. This crewman must be currently manning a gun (and cannot be the pilot).
- f) Advantageous position (up to +50, GM discretion). For example, an opponent is just lifting off a planetary surface, is surprised or in orbit at Zero Thrust, etc. would be at a severe disadvantage.
- g) Ship size. In general, a smaller ship is more maneuverable and potentially "quicker" than a larger craft. See the Ship Mass Key on the Status Chart for Initiative bonuses based on ship mass.

Combatant ship with highest modified roll has initiative throughout the Turn, and may fire first. This player also has the option of moving first or forcing the opponent to do so. Initiative is recalculated (if necessary) at the beginning of each turn.

General Power Allocation:

If a ship's main energizer is not powerful enough to run all systems simultaneously, the Head Engineer allocates power to the appropriate systems. This is locked in for the duration of the turn. Note that power *within* a weapons system can be shifted from round to round (from one Laser cannon to another, for instance). Consult the Starship design section for details of power systems.

Shield Facing:

If a special shield facing is desired (double shielding over one ship-quarter, for instance) it must be declared here, and is locked in for the turn. Special shield facing can only be used if a *Defense* program is in CPU.

EW Declaration:

Each combatant declares (or writes down secretly if he prefers) ship EW allocation for that turn.

NOTE: Power allocation, Shield facing and EW declaration can be changed as often as every *round* IF there is a crewman devoting full attention to manipulate each function. The GM may wish to have each crewmember make a static maneuver roll (using appropriate skill bonus) to determine whether or not he is successful in such endeavors as well.

After these initial factors have been established, combat proceeds through the six rounds. Each round has a number of phases, as defined below.

COMBAT ROUND SEQUENCE

- 1) Declaration of Fire (all weapons)
- 2) Sensor Scan Resolution
- 3) Energy Weapon Fire Resolution
- 4) Movement
- 5) Missile Jamming Declaration and Resolution.
- 6) Missile Strike Resolution

DECLARATION OF FIRE:

This can either be done secretly or announced. Each player declares what Energy weapons will be fired and at what target(s), and what missiles are fired, and at what Target(s). Note gun facings (Combat Status Chart, 6.16) and limitations. In some situations, all guns may not be brought to bear simultaneously. Power expenditure and missile inventory should be noted.

SENSOR SCAN RESOLUTION:

If fire is done secretly, this phase is important for combatants to know their opponents' position and what attacks have been launched. Sensor officers roll and make appropriate modifications (Com-

puter analysis, Operator Skill bonus, EW, etc.) and GM reveals any learned data. This is treated as a static maneuver if **Future Law** is used.

ENERGY WEAPON FIRE RESOLUTION:

When resolving Energy Weapon attacks, several factors are taken into account.

Offensive Bonuses:

- a) Gunner's Skill Bonus. Applicable only to the gun manned by the gunner with that bonus. Also only usable if the ship has a Gunner Interface program in the CPU.
- b) HUD (Heads Up Display) Bonus. Applicable only to appropriate manned gun.
- c) Weapon Size/Range. Weapon bonus is directly related to Mk. number (i.e., an Mk. 20 laser cannon has an innate +20 bonus). For range subtraction, each hex of distance traveled (counting the target hex but not the source hex): subtract 5 from the total OB. The Mk. number also reflects total range: an Mk. 20 gun would have a 20 hex range.
- d) Ship Predict Bonus. This is a variable bonus Computer program which must be in the CPU to be used. The Target Lock-on program must also be running in the CPU to use Predict. Once activated, Predict acts as a bonus to all energy weapons, no matter how many targets.
- e) Central Gunner Control. *Used only with guns not specifically manned.* Operational only with Central Gunnery Control program in CPU, it allows the Pilot (or other bridge crewmember) to fire all guns using his Gunner Skill Bonus (-10 to all guns for each gun more than one he remotely controls). All guns so linked must be aimed at the same target, and no HUD bonuses are allowed.
- f) EW Rating. Only applicable to OB if used (and allocated this turn) to counteract target DB; also has limitations in this area. See section 6.13 on Stealth/EW abilities for more details.
- g) Pilot Combat Pilot bonus. The Combat Pilot bonus of whomever is the main pilot of the ship can either be used on offense or defense. It cannot be split between the two. Keep in mind also that — if using **Future Law** Skill Levels — no more Combat Pilot skill levels can be applied than there are Function Rating levels of Sublight drive for the ship. (The pilot must have maneuvering power with which to employ his skill, right?)

EXAMPLE: Preston Perfect, the famed space pilot, has a Combat Pilot bonus of +75 (25 Skill Levels!), but is trapped aboard the space freighter **Sluggish Moose**. The **Moose** has but 5 Function Rating levels in Sublight drive. She is under attack by evil Terrasmaks. Preston would like to employ his fabulous Combat Pilot skill, but is hampered by the **Moose's** lack of maneuverability. He only gets to add +25 (five skill levels).

Defensive Bonuses

- h) EW Rating. Only applicable to DB if allocated this turn. May be partially or fully cancelled by Attacker EW. See section 6.13 for more details on the various abilities of EW.
- i) Shields. Set DB as designed for ship, based on shield rating picks. Only usable at 1/2 value if Defense program not in CPU. See section 6.13 for more details on shields and shield arrangement.
- j) Ship Evade Bonus. This is a variable bonus Computer program which must be in the CPU to be used. It provides an additional DB based on evasive maneuvers controlled by the ship computer. Ship hull mass encumbrance must be subtracted from either this or the Combat Pilot skill bonus. Also, as mentioned under **Combat Pilot** in Offensive Bonuses, the Evade rating level cannot exceed the number of Sublight drive rating levels (any additional Evade rating levels are wasted, as the ship is incapable of the more complex maneuvering).

- k) Pilot Combat Pilot Bonus. This skill can be directly applied to the DB by the astronaut piloting the ship. It can work in addition to ship Evade bonus. The total employed Combat Pilot skill levels cannot exceed the Sublight drive rating level (see **Combat Pilot** under **Offensive Bonus**). **Combat Pilot** and **Evade** are treated separately, however.

EXAMPLE: A ship with a Sublight drive rating of 5 can benefit from up to a Combat Pilot skill level of 5 (+25 to DB) and an Evade rating of 5 (+25 to DB); thus a total maneuvering DB of +50.

All of these factors are taken into account and a D100 open-ended roll is made and modified, one for each weapon — except when central fire control is used: one roll is made, and the roll plus the pilot Gunner bonus is added to each gun bonus under centralized control. The results and criticals (if any) are applied immediately. Damage inflicted by the ship with initiative can affect the return strike ability of the target ship(s).

MOVEMENT:

Each ship has an Acceleration Rating, based in its maximum sublight acceleration capability. See the Movement Table (on the Combat Status Display sheet) for the various ratings. Note that the Acceleration Rating (AR) is the potential *change in velocity*, the number in the AR column corresponding exactly to the number of hexes a ship could reduce or increase its speed (in a straight line). The number need not be used (i.e., constant velocity) or part of it may be used, but it cannot be exceeded.

Note that pilot maneuver rolls (using the vehicular maneuver table) for every movement in combat are **not** done. Initiative rolls are all that need be made for movement.

EXAMPLE: Sky Cloudd is pilot of the scout ship **Meridian Queen**. The **Queen** is stationary in orbit around a planet and Sky wants to head out of the system at full thrust. The **Queen's** Acceleration Factor is 11 (twelve rating picks in sublight drive under Starship construction). The first round of thrust the **Queen** accelerates from Zero velocity to 1,100 km/rnd (110 kilometers per second). The second round she accelerates from 1,100 km/rnd to 2,200 km/rnd. Third round the **Queen** increases speed from 2,200 to 3,300 km/rnd. She can thus accelerate (as long as she continues on a straight course) until reaching what Sky considers a reasonable cruising speed (note that it would take the **Queen** a little over 0.75 hours to reach the speed of light, 300,000 km per second, and the Hyperspace threshold.) Naturally Sky would want to travel at slightly below this speed to prevent an accidental slipover, and computer monitoring would keep velocity constant below the danger area. Deceleration would be performed in the same manner. Note that, if Sky were planning any sharp turns or other maneuvers, he would probably keep to a lower speed until they were completed, because of the turn restrictions (see below).

Turning:

The concept of turning in a frictionless environment is somewhat complex, but once understood is relatively easy to implement in this system. Two factors need to be kept in mind when planning to initiate a turn during movement. They are:

— Continuing velocity and direction from last turn (this is ascertainable from the *Velocity and Direction* display on the Combat Status Chart).

— Number of AF points available for use this round (this corresponds to the Rating Picks on the table, also on the Combat Status Chart).

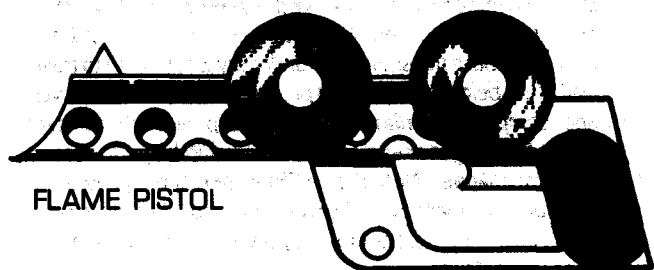
Look over the Turn Table (on the Status Chart). Across the top are turn ranges in 30° groupings. Down the left column are Acceleration to Velocity ratios ("V" for instance means that the ship is

travelling at the same velocity as its Acceleration factor). For the **Meridian Queen** (from the example above) this would be 1100 km/rnd. It is important to remember that the velocity used for this ratio is the velocity of the ship from last round (which should be easily read from the Velocity display).

The numbers within the chart indicate how much (or how little) velocity the ship can have at the end of the round after the turn. If two numbers are given (.7-1.1V for instance) they indicate that the ship could have decelerated to .7 of its original velocity or up to 1.1 times its original velocity. The new speed is also, of course, in the new direction. If only one number is given in the table, the ship could decelerate to Zero velocity or as much as the number indicated. This new velocity is also the actual number of hexes travelled during the round the turn is made.

EXAMPLE: The **Meridian Queen** is travelling at a velocity of 1000 km/rnd. Her Acceleration Factor is 1100 km/rnd. The pilot (Sky) wishes to initiate a 60° turn. Checking the table, the closest acceleration/velocity ratio is 1.2 (always round up in the favor of the ship when determining A/V ratio). As can be seen from the table, the **Queen** can have — at the end of the round — a maximum velocity of 1.3 times the initial velocity. In this case it would be 1300 km/rnd. Sky, wishing to maintain as much speed as possible, chooses this velocity. He could, if desired, bring the ship to a full stop.

To determine exactly where on the grid map the ship will end up, check which direction the ship is currently heading, and visualize a line extending out from the ship in the direction of the desired turn. See figure 1. The dotted line is the visualized 60° turn for the **Queen** from the example above (each hex side is a 60° difference). Now, imagine a line halfway between the desired direction and the current direction (the dashed line on Figure 1). The **Queen** can move as much as 1300 km along this line (13 hexes at 100 km/hex). Move the ship along this line, counting hexes as closely as possible. If there is a question over which hex the ship can end up in (the two labelled "A" and "B" in the figure), again, give the benefit of the doubt: Allow the **Queen** to end up in hex "B", if the pilot desires. Of course, any turn of less severity is also permitted. The ship counter (if used) should now be pointing in a direction 60° from its original vector. The Velocity chart on the Ship Status Display should be updated to 1300 km/rnd from the 1000 it was previously set on.



Remember of course that ships can engage in vertical as well as horizontal turns. To accomplish this, use the same rules, but visualize a vertical hex grid intersecting the flat one. For simpler combat, or while just learning the system the GM may wish to disallow this option. Include it if possible, however, as it does add another 'dimension' to starship combat. (yuk-yuk).

Note: This is somewhat of an abstraction of the ship's actual movement, though the final ship position and displacement are very reflective of reality. In actuality, the ship would have moved in an arc towards its new position and vector, but since the interrim positions are unimportant to combat, this easier abstraction can be implemented. For the adventurous, we include in the appendix the actual formulae used to calculate turn and velocity.

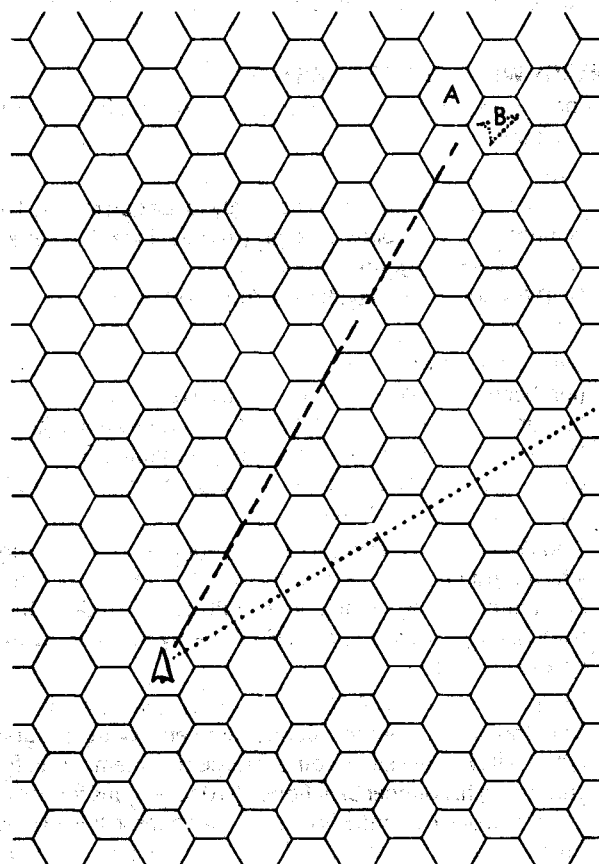


Figure 1

Two or more ships may inhabit the same hex. If they occupy the same hex at the same altitude, visualize the two passing side by side — or above and below — at (relatively) close range. The ship with initiative has the option of deciding which flank to pass on. Determine, based on the visualized pass, which weapons — include all front and rear mounted weapons — can be brought to bear during the pass (next fire phase), with no range subtractions.

MISSILE JAMMING DECLARATION AND RESOLUTION:

After movement, missiles in flight approach their target (irregardless of new ship positions). Target ship EW operators may now use their Skill-bonuses and any EW Rating points allocated to Jamming. Note: at least five points of EW must be allocated to jamming for operators to use EW jamming at all. Allocations of EW skill must be in units of five-point multiples.

With jamming, the EW bonus is used as an attack against an incoming missile — the missile receiving a bonus equal to its Mk. rating. More than one missile can be acted upon in a given round, but there must either be multiple operators, or the operator's skill bonus must be split (in units no smaller than five points). Note that missile jamming is the only time that the EW operator skill bonus is employed in combat. For more details and examples regarding EW Jamming, see Stealth/EW, section 6.13.

MISSILE STRIKE RESOLUTION:

This is determined in a way similar to Energy Weapon attack resolution, with a few important exceptions: 1) Missiles are fired from central control, and 2) They have no range subtraction. This resolution is done at the very end of the round, after any jamming attempts have been made. Damage inflicted here is applied effective beginning of the next round (just previous to the next energy weapon exchange). This assumes some travel-time delay.

6.16 COMBAT STATUS CHART

ALTITUDE REGISTER

+700

+600

+500

+400

+300

+200

+100

+0

-100

-200

-300

-400

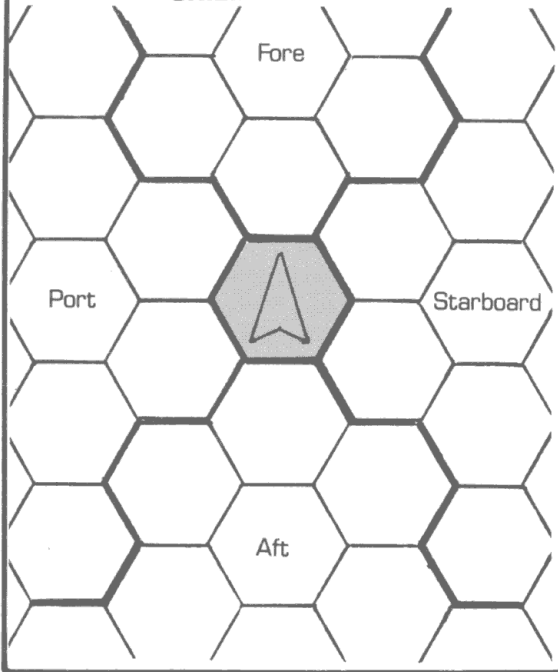
-500

-600

-700

Z coordinate in kilometers

SHIELD FACINGS



SHIP ACCELERATION

25	16.25
24	16
23	15.75
22	15.5
21	15.25
20	15
19	14.5
18	14
17	13.5
16	13
15	12.5
14	12
13	11.5
12	11
11	10.5
10	10
9	9
8	8
7	7
6	6
5	5
4	4
3	3
2	2
1	1

Acceleration Rating (# of Picks)

Actual Acceleration (x 100 km/rnd)

SHIP VELOCITY

KM/RND X 10	KM/RND X 100	KM/RND X 1,000
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

TURN TABLE

DESIRED TURN (in degrees)

A/V ratio	0°	1 - 30	31 - 60*	61 - 90	91 - 120	121 - 150	151 - 180
.01 V	-	@	-	-	-	-	-
.05 V	.95-1.05	@	-	-	-	-	-
.1 V	.9-1.1	@	-	-	-	-	-
.3 V	.7-1.3	@	-	-	-	-	-
.5 V	.5-1.5	.8-.9V	-	-	-	-	-
.6 V	A + V	.7-1.1V	-	-	-	-	-
.7 V	A + V	.6-1.3V	-	-	-	-	-
.8 V	A + V	.4-1.5V	.5-.6V	-	-	-	-
.9 V	A + V	.2-1.6V	.25-.75V	-	-	-	-
V	2V	1.8V	1V	0	0	0	0
1.2 V	A + V	2V	1.3V	.6V	.3V	.2V	.2V
1.4 V	A + V	2.2V	1.6V	1V	.6V	.4V	.4V
1.6 V	A + V	2.4V	1.9V	1.25V	.9V	.7V	A - V
1.8 V	A + V	2.6V	2.1V	1.5V	1.1V	.9V	.8V
2 V	3V	2.8V	2.3V	1.7V	1.3V	1.1V	1V
2.5 V	A + V	2.8V	2.5V	1.8V	V -.5	V -.866	A - V
3 V	4V	v + .866	3.4V	2.8V	2.4V	V -.866	A - V
4 V	5V	"	4.4	3.8	3.4	V -.866	A - V
5 V	6V	"	V +.5	V -.1	V -.5	"	"
6 V	7V	"	"	"	"	"	"
7 V	8V	"	"	"	"	"	"
8 V	9V	"	"	"	"	"	"
10 V	11V	"	"	"	"	"	"

Key:

V: velocity, as of the end of the previous round (also as indicated on the ship display).

A: Acceleration; the Sublight Acceleration Rating of the ship.

*: To complete a full 60 ° turn, an Acceleration/Velocity ratio of .866 (as opposed to .8, as noted in the chart) must be achieved. This concept should come into play when there is doubt about the extent of a turn, and the restraint can be employed.

@: indicates that a turn is not initially possible; the craft must decelerate down to no more than 2x it's Acceleration Rating (AR) or "save up" acceleration points, and initiate a turn after a rating of 5 or more has been reached.

A range of numbers in a box (e.g., .7-1.1V) indicates the possible minimum to maximum velocities available to the ship executing the turn — as a factor of the previous velocity. See section 6.1.

One number in a box indicates the maximum velocity available to the ship. The minimum possible is Zero.

Offensive Bonus:

- a) Missile Mk. Number. Note that there is no range subtraction for missiles. They have a maximum range: the number of hexes equal to their Mk. rating (assuming the standard hex scale). *There is no ceiling of 10 hexes as with energy weapons since missiles travel at hyperlight speeds, being equipped with their own miniature RIF generators.*
- b) Missile Targeting. This is a variable bonus Computer program which must be in the CPU to be used, and is similar in purpose to predict, though applicable only to missiles. It allows the computer to *install target data and course programming into the missile's internal tracking system.* The Target Lock-on program must also be running in the CPU to use Missile Targeting.
- c) EW Rating. Only applicable to OB if used (and allocated this turn) to counteract target DB; also has limitations in this area. See section 6.13 on Stealth/EW abilities.

Defensive Bonus:

All are exactly the same as against Energy Weapons. After all factors are resolved, a new round is begun.

6.17 SHIP STATUS CHART

This chart (see inside front cover) is the complement of the Combat Status chart, providing a handy reference for all general ship information, as well as a damage/malfunction status board.

6.2 VEHICULAR COMBAT

6.21 SMALL SPACECRAFT COMBAT

These combat rules are appropriate for very small, *maneuverable* spacecraft such as SMAC fighters. The rules are useable either for such craft engaged with each other, or with a larger ship, which is treated as essentially static during the combat. The Starship Combat rules should be read and understood before attempting to use these rules, as they are based closely on Starship combat concepts.

SMAC (Singly Manned Attack Conveyance) Fighters are an entire class of spacecraft and represent a class of space combat as well. They are very small, usually capable of carrying only one man (the pilot/gunner) in a small cockpit. With a rather limited range, SMAC fighters invariably operate from a base ship or orbiting station equipped with docking and service facilities. SMACs are very maneuverable, capable of rapid acceleration and tight turns. Their weaponry is powerful for their size, but the fire control systems (massive, expensive equipment necessary for long-range Starship combat) are relatively simple.

This space can be saved because SMAC fighters close with their target to within visual range and fire using only HUD (heads Up Display) bonus and gunner bonus for targeting. Against such attacks Evade programs for large craft are useless. EW defense is ineffective at such close range as well, since it has limited capability to prevent visual contact at such range.

As has been said before, the combat parameters when SMAC fighters are involved are on a different scale altogether. However, most of the rules employed in Starship Combat may be reused here, with smaller ranges. The differences are detailed point-by-point below, corresponding to the sections in Starship combat.

6.211 Ship-mounted Weaponry

SMAC Fighters can utilize almost any type of weapon that a Starship can, though they rarely carry the larger, more sophisticated missiles. Plasma Guns are the only prohibitively massive weapon at any size. The others are usually Mark 10, or Mark 20 at the largest.

When attacks are made against SMAC Fighters, the Aircraft critical chart is used, not the Starship criticals. When SMACs attack Starships, the Starship crits are used as always.

6.212 Systems Important to Combat SENSORS

These are important for SMAC astrogation and tracking, but not used for this style of short-range combat.

SHIELDS

SMAC fighters often do not even have shields, and if they do they are not very powerful. When present, however, they can be shifted for "double shielding" just like starship shields. This is done manually, and does not require a special computer program.

COMPUTER PROGRAMS

A SMAC Fighter computer is small, and possesses few of the usual combat programs (Evade, Predict, Missile Targeting, etc. are not needed). Smaller versions (25% Starship program cost) of N-Space Astrogation, Piloting, and other aids are present in most types, as well as Gunner Interface programs which allow for firing to be committed and implemented.

STEALTH/ELECTRONIC WARFARE

While Stealth fields are ineffective against SMAC Fighter attacks, the fighters themselves often have Stealth fields to protect them from starship attacks. This is possible, of course, because the Starships still depend heavily on Sensors and other electronic targeting aids. Stealth fields used on SMACs are usually simple affairs, however, being able to only use the *Cloaking* and *Defensive Bonus* (see Starship Combat Rules) options.

6.213 Small Spacecraft Combat Conventions

— One hex equals 100 meters (one tenth of a kilometer) where they represented one 100 km in Starship combat.

— Acceleration numbers on the chart now represent 100 m/rnd (for the purpose of ship-to-ship maneuvering), where they represented 100 km/rnd in Starship Combat. All general acceleration and movement rules apply. SMACs have RIF generators like starships.

— Combat proceeds in Turns like Starship combat, mostly for the determination of initiative and certain starship functions.

6.214 Combat Sequence

At the beginning of each round, initiative is determined for all ships involved. Power allocation, shield distribution and EW allocation are also determined for Starships (see starship rules) SMAC Fighters' power allocation is fixed, their shields are manually switched by the pilot (a maneuver). SMAC Fighter EW would be set on Defensive Bonus as the only useful combat option.

Initiative is determined by an open-ended percentage roll, modified by the following factors:

- a) N-Space acceleration ratings of the involved ships, each rating level being equal to +5.
- b) (Starships only) Computer Tactics program rating bonus.
- c) N-Space Combat skill bonus of Pilot.
- d) EW generated by the ship (irregardless of allocation).
- e) Highest gunner skill bonus (one from each ship). Unlike the Starship rules, the gunner of a SMAC fighter can also be the pilot.
- f) Advantageous position (see starship rules).
- g) SMAC fighter initiative bonus: +100 (all SMAC fighters receive this bonus, reflecting their superior maneuverability over Starships).

Combatant ship with highest initiative fires first, and has the option of moving first or forcing the opponent(s) to do so. Initiative for SMACs is recalculated every round.

All other Starship factors are determined, if needed.

After these factors have been established, combat proceeds through the phases, as listed below. Phases with an asterisk (*) after them are applicable only for starship combat, and may be ignored if only SMACs are involved.

COMBAT ROUND SEQUENCE

- 1) Orientation Phase
- 2) Declaration of Fire *
- 3) Sensor Scan Resolution *
- 4) Energy Weapon Fire Resolution
- 5) Movement
- 6) Missile Jamming Declaration and Resolution *
- 7) Missile Strike Resolution

The details of these phases are explained in Starship Combat, section 6.15. Exceptions and changes to those rules are noted below.

DECLARATION OF FIRE: An important alteration: SMAC Fighter Gunners do not have to declare fire during phase 1. They have the option of *holding fire* on opportunity until after their move in phase 4 and before the next combatant's move (assuming they have the initiative and desire to move first). They can then choose a maneuver to close with the opponent and fire before the opponent can execute a maneuver to avoid the attack. This has no effect on the combat sequence in the following round.

ENERGY WEAPON FIRE RESOLUTION:

Notes:

All attacks by Starships on this combat scale are *point-blank*, due to the extremely short range for their powerful weapons.

SMAC weaponry in general has only *one-quarter* the range of Starship weaponry (should a SMAC ever find itself forced to fight on the Starship 100 km/hex scale). This is reflected by subtracting 20 from the gun bonus for every hex of range to target.

Offensive Bonuses:

- a) Gunner's Skill Bonus. Applicable only to the gun manned by the gunner with that bonus. Also only useable by Starships if the ship has a Gunner Interface program in the CPU.
- b) HUD Bonus. Applicable only to appropriate manned gun.
- c) Weapon Size/range.
- d) Pilot Combat Pilot skill bonus (if using **Future Law**). SMAC pilots are able to utilize 1/2 of their *Combat Pilot* bonus if also using their Gunner Bonus in the same round. The *Combat Pilot* bonus can be applied to either MB or DB.
- e) Central Gunner Control. Only applicable to Starships.
- f) EW Rating: only useable by a Starship to counter a SMAC defensive EW.

Note that *Predict* is not used. SMAC combat maneuvering is too unpredictable and close in for such programming.

Defensive Bonuses:

- g) EW Rating. Only useable by SMAC's against Starships — not Starships vs SMAC's. If individual Starship gunners wish to ignore Sensor input and use visual/HUD data only, they are immune to SMAC EW as well. They must make a successful *Perception* roll to locate each target, however.
- h) Shields. This is a set DB as designed into the ship, based on shield rating picks. See section 6.13 for more on shields, including shield facing changes.
- i) Pilot Combat Pilot Skill Bonus. See "d)" above under Offensive Bonuses, and "k)" in section 6.15 for details.

Note that *Evasive* is not applicable to SMAC combat.

MOVEMENT:

Full movement must be completed before a ship can fire. No ship can fire weapons while theoretically in 'mid-move'.

The Turn rules are used, but only SMAC Fighters may move and turn. The reason for this is that they can easily accelerate to pace with a larger, less maneuverable ship, and after matching velocities, they can freely dart about on the reduced scale, harassing the larger ship at short range. Therefore, the larger ship is theoretically moving, but the SMACs are keeping pace, and still attacking at will. Large ships cannot perform such discreet maneuvers because of their mass and the necessity of their design parameters.

MISSILE JAMMING DECLARATION AND RESOLUTION:

Non-explosive projectiles fired by SMAC's cannot be jammed, as they have no internal guidance system. Other types of missile carried by SMAC's may be without such a system, cutting their price in half, and also making them only useable at short (SMAC combat system) range.

6.22 AIRCRAFT COMBAT

Due to the vast range of types of aircraft and their myriad abilities and forms, general guidelines for aircraft combat are included here, to be extrapolated from and added to as the GM desires.

Basically, the Small Spacecraft Rules can be applied here, with a few additional "twists":

— Since there will most certainly be a strong gravity field in effect, altitude becomes a very real factor in determining movement. Aircraft can use it to accelerate, but lose altitude (dive) and must fight against it to gain altitude. Aircraft with gravitic lift are pretty much immune to this problem, and can ignore gravity. Others can — and must — incorporate it.

As a general guide for climbs/dives, add/subtract 25% to the velocity for every round descending/ascending up to 30°, and 50% to every round descending/ascending up to 60°.

Use the Turn Table on the Combat Display Chart for aircraft turns, substituting theoretical max velocity/current velocity instead of Acceleration/velocity. The Aerodynamics bonus acts as a percentage add to max velocity for the purpose of turning. Naturally, combinations of turning and descent are possible. For convenience (if using a hex grid) declare hex size to be a convenient distance for combat. For instance, if the cruising speed of a combatant is 500 kph, have it be able to move 5 hexes per round. This makes figuring easier, and actual distance travelled is fairly irrelevant when it involves only air-to-air combat. If ground or marine combatants are involved, exact displacement determination is necessary, and hex size must be determined.

Regarding Missiles used by aircraft: since the travel distance for missiles used by aircraft are relatively very small, these missiles have no mini-RIF generator or high-speed drive system. They cost only half the Starship missiles (see Starship Parts Cost, sec. 4.212). Range is 1 km per Mk. number for these missiles air-to-air; 100 km per Mk. number air-to-ground.

6.23 LAND AND MARINE VEHICLE COMBAT

Movement for this type of combat is probably the easiest of all, due to the relative simplicity of maneuvering on the ground. All land-oriented vehicles have sophisticated braking systems, and ships can reverse engines and maneuver fairly effectively. The GM should use his discretion in determining maneuverability, based on vehicle size, design, and maneuver bonus. Again, the standard phase sequence is applicable:

COMBAT ROUND SEQUENCE

- 1) Orientation Phase
- 2) Declaration of Fire
- 3) Sensor Scan Resolution
- 4) Energy Weapon Fire Resolution
- 5) Movement
- 6) Missile Jamming Declaration and Resolution
- 7) Missile Strike Resolution

It is crucial that initiative be determined in these situations — see the Initiative chart, 6.53. In general, craft move in the following order (assuming the fastest and most maneuverable craft move last).

Ships
Ground Troops
Submersibles
Elite Troops
AFV's
Powered Troops
Aircraft
Starships
SMAC Fighters.

Movement undetectable to the opponent should be secretly recorded.

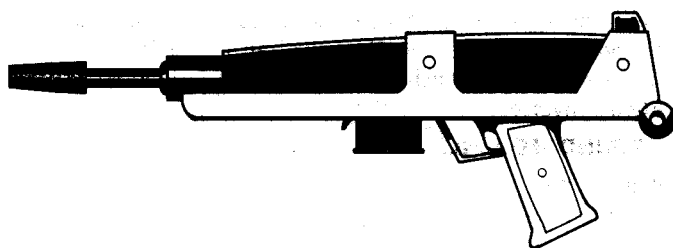
6.24 DAMAGE THRESHOLD MODIFICATIONS

Under certain circumstances, the damage thresholds for the Vehicular Combat Attack Charts are ignored. Note that if a target vehicle has a mass of less than 500 tons (approximately), AND the attacking weapon is Mk. 10 or greater, ALL attack damage thresholds (Mk. 10 max, Mk. 20 max, etc.) are ignored. This reflects the fact that relatively smaller vehicles do not have the structural integrity to withstand the lower Mk.# attacks as reflected in the attack tables. For example, a Mk. 15 projectile has a better chance of devastating a 25 ton AFV of CAT 28 than a 10,000 ton support cruiser of CAT 28, merely because the AFV has less structural integrity to rebut the force of the attack (despite the armor).

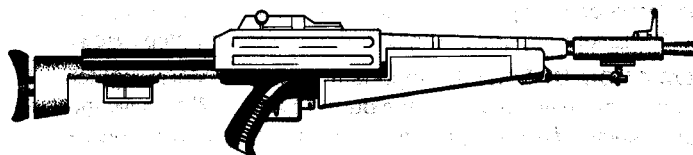
6.3 MIXING TYPES OF COMBAT

6.31 PERSONNEL VS CONSTRUCT ARMOR TYPES (VEHICLES)

A general rule when attacking Construction Armor Types (CAT 21-30) with personal weapons: reduce the weapon Mark number by two thresholds (e.g., a Mark 5 Laser would not be able to exceed the Mk. 3 threshold). Use the AT 20 column, and subtract 10 from the weapon bonus for every level over CAT 21. For CAT 29, reduce the threshold by three levels, and for CAT 30 reduce four levels. Divide all hits delivered by ten (rounding heavily up: 1 hit on the chart means one hit; 10 hits on the chart still means 1 hit; 11 hits is 2 hits, etc.).



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BLASTER RIFLE
Conboy Labs

Any criticals delivered by personal weapons should be extrapolated to a reduced severity as well. All hits indicated should be divided by 10; all system damage at 1/10th that indicated (for a critical result saying the system is destroyed, the GM might say that the system power is reduced by 10%. Alternatively, the target craft hit potential can be multiplied by ten (though specific damage should still be reduced to 10% of that indicated. The GM may wish to additionally extrapolate the critical result to more realistically reflect the situation.

When Mounted weaponry (Mk. 10 and up) attacks personnel, use CAT 21 and allow all such weapons to attack at full threshold potential (even Mk. 10 guns can max out at 150, the normal Mk. 50 max out). If trying to hit a specific individual, that person gets their full Quickness DB + 50 (due to being such a small target). Anyone within 1 meter of the target takes the same damage. All those more than 1 meter away but within 10 meters of the target take 1/10th of the hits as 'ground zero'. Groups of 10 or more being attacked do not get the +50.

Substitute **Slash** criticals when **Pierce** is indicated; **Impact** crits when **Blast** is indicated.

Obviously, the hit amounts are potentially excessive; it can be safely assumed that if a target takes more than ten times their hits plus Constitution, they are totally vaporized and irretrievable.

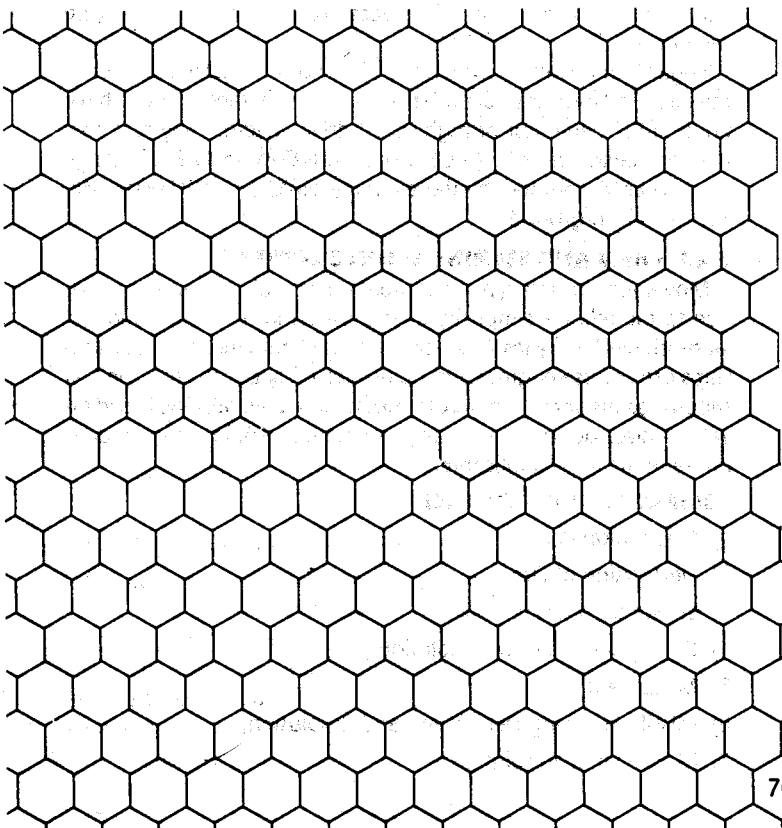
6.32 MOUNTED WEAPONS VS STRUCTURES

Unshielded structures are very vulnerable to mounted weapons attacks. Assume each 10 Mk. of a weapon can vaporize/melt/blast through a 5 cm thick sheet of normal steel in a 1 meter diameter. (thus an Mk. 50 gun could burn through 50 cm of steel 5 meters in diameter). Most such weapons can be set to "disperse", substituting meters of diameter for centimeters of depth.

For other materials, use these multipliers to the dimensions given above: Masonry (brick or concrete): 5x. Wood: 10x (and it is aflame).

Range subtraction for all but Starship and permanent ground installation weapons is -5 every 100 meters in a clear Terran atmosphere. Halve the range in dense clouds or fog. For Starships and permanent ground weapons the subtraction is only -5 every 100 km at sea level. As a result, Starships can attack planetary surface targets from directly above in low orbit with only a small subtraction.

Used in this way, vehicles can be devastatingly destructive to most buildings. With a few shots a large Starship can lay waste to entire city blocks.



6.411 Projectile

Attack Chart for: Non-explosive Projectile

	30	29	28	27	26	25	24	23	22	21	
01-02	F	F	F	F	F	F	F	F	F	F	01-02
03-06	0	0	0	0	0	0	0	0	0	0	03-06
07-10	0	0	0	0	0	0	0	0	0	0	07-10
11-14	0	0	0	0	0	0	0	0	0	0	11-14
15-18	0	0	0	0	0	0	0	0	0	0	15-18
19-22	0	0	0	0	0	0	0	0	0	0	19-22
23-26	0	0	0	0	0	0	0	0	0	0	23-26
27-30	0	0	0	0	0	0	0	0	1	0	27-30
31-34	0	0	0	0	0	0	0	0	2	1	31-34
35-38	0	0	0	0	0	0	0	0	3	4	35-38
39-42	0	0	0	0	0	0	0	0	4	7	39-42
43-46	0	0	0	0	0	0	0	1	5	10	43-46
47-50	0	0	0	0	0	0	0	2	7	15	47-50
51-54	0	0	0	0	0	0	1	3	10	20	51-54
55-58	0	0	0	0	0	0	2	6	15	25	55-58
59-62	0	0	0	0	0	0	4	9	20	30	59-62
63-66	0	0	0	0	0	1	6	13	25	35	63-66
67-70	0	0	0	0	0	2	8	17	35	40	67-70
71-74	0	0	0	0	0	3	10	21	45	45	71-74
75-78	0	0	0	0	1	5	12	25	55	50	75-78
79-82	0	0	0	1	2	7	15	30	65	60	79-82
83-86	0	0	0	2	5	10	18	35	75	70A	83-86
MAXIMUM RESULT FOR MK 10 WEAPONRY											
87-90	0	0	1	3	8	14	21	40	85	80A	87-90
91-94	0	1	2	4	11	17	24	45	95A	90A	91-94
95-98	0	2	4	5	15	20	27	50A	110A	100A	95-98
99-102	0	3	7	7	18	24	30	60A	120A	110B	99-102
MAXIMUM RESULT FOR MK 20 WEAPONRY											
103-106	0	4	10	9	22	28	35	70A	130A	120B	103-106
107-110	1	6	13	12	30	32	40A	85B	140B	140B	107-110
111-114	2	8	17	16	37	36A	45A	100B	155B	160B	111-114
115-118	5	10	21	20	41	40A	50A	115B	170B	180B	115-118
MAXIMUM RESULT FOR MK 30 WEAPONRY											
119-122	8	14	25	35	45	45A	55A	130B	185B	200C	119-122
123-126	11	18	30	40	50	50A	65B	145B	200B	225C	123-126
127-130	14	22	35	45	55A	55A	75B	160C	225C	250C	127-130
131-134	17	26	40	50A	60A	60B	85B	175C	250C	275C	131-134
MAXIMUM RESULT FOR MK 40 WEAPONRY											
135-138	21	30	45A	55A	65A	70B	110C	215C	300C	325D	135-138
139-142	25	35	55A	60A	70B	80B	120C	235D	325D	350E	137-142
143-146	30	45A	65A	70A	80B	90C	140D	255D	350D	375E	141-146
147-150	35A	55A	75A	80B	90C	100C	160D	275E	375E	400E	147-150
MAXIMUM RESULT FOR MK 50 WEAPONRY											
	30	29	28	27	26	25	24	23	22	21	

All criticals are Pierce

UM 01-02: Roll 1D10: 1-5 Misfire, projectile lost; 4- 10 Launcher jam, roll malfunction severity.

6.412 Explosive Missile

Attack Chart for: Conventional Explosive Missile

	30	29	28	27	26	25	24	23	22	21	
01-02	F	F	F	F	F	F	F	F	F	F	01-02
03-06	0	0	0	0	0	0	0	0	0	1	03-06
07-10	0	0	0	0	0	0	0	0	0	2	07-10
11-14	0	0	0	0	0	0	0	0	1	3	11-14
15-18	0	0	0	0	0	0	0	1	1	5	15-18
19-22	0	0	0	0	0	0	0	1	2	7	19-22
23-26	0	0	0	0	0	0	1	2	3	9	23-26
27-30	0	0	0	0	0	0	2	2	4	12	27-30
31-34	0	0	0	0	0	0	3	3	6	15	31-34
35-38	0	0	1	0	0	1	4	4	8	20	35-38
39-42	0	0	1	0	1	2	5	5	10	25	39-42
43-46	0	0	1	1	1	3	6	7	13	30	43-46
47-50	0	0	2	1	2	4	7	9	16	35	47-50
51-54	0	0	2	2	2	5	8	11	20	40A	51-54
55-58	0	0	2	3	3	6	10	13	25	45A	55-58
59-62	0	0	3	3	4	7	12	17	30A	50A	59-62
63-66	0	1	3	4	5	8	15	20	35A	60A	63-66
67-70	0	1	4	4	6	10	20	25	40A	70A	67-70
71-74	0	2	4	5	7	12	25	30A	50A	80A	71-74
75-78	1	2	5	6	9	14	30A	35A	60A	90A	75-78
79-82	1	3	6	7	11	16	35A	40A	70A	100A	79-82
83-86	2	4	7	8	13	20	40A	45A	80A	110B	83-86
MAXIMUM RESULT FOR MK 10 WEAPONRY											
87-90	2	5	8	10	17	25	45A	50A	90A	120B	87-90
91-94	3	6	9	12	20	30	50A	60A	100B	130B	91-94
95-98	3	7	10	14	25	35A	55B	70B	110B	140B	95-98
99-102	4	8	13	17	30	40A	60B	80B	120B	150C	99-102
MAXIMUM RESULT FOR MK 20 WEAPONRY											
103-106	5	9	16	20	35	45A	65B	90B	130B	170C	103-106
107-110	6	10	20	25A	40A	50A	70B	100B	140C	180C	107-110
111-114	7	12	25	30A	45A	55A	75B	110B	150C	190C	111-114
115-118	8	14	30A	40A	50A	60A	80B	120C	160C	200D	115-118
MAXIMUM RESULT FOR MK 30 WEAPONRY											
119-122	9	16	35A	50A	55A	70B	90C	130C	180D	225D	119-122
123-126	10	18	40A	60A	60A	80B	100C	140C	200D	250D	123-126
127-130	11	20A	45A	70B	70B	90C	110C	150D	220D	275D	127-130
131-134	13A	23A	50A	80B	80B	100C	120D	160D	240E	300E	131-134
MAXIMUM RESULT FOR MK 40 WEAPONRY											
135-138	15A	26A	55B	90B	90C	110C	130D	180D	260E	325E	135-138
139-142	17A	30A	60B	100C	100C	130D	150D	200E	280E	350E	139-142
143-146	20A	35B	70B	115C	120D	150D	170D	225E	300E	375E	143-146
147-150	30A	40B	80C	130D	140D	180E	200E	250E	330E	400E	147-150
MAXIMUM RESULT FOR MK 50 WEAPONRY											
	30	29	28	27	26	25	24	23	22	21	

UM 01-02: Roll 1D10: 1-5 Misfire, projectile lost; 4-9 Launcher jam, roll malfunction severity; 10 premature detonation, roll point-blank attack on ship.

Blast criticals.

6.413 Nuclear Missile

Attack Chart for: Thermonuclear Missile

	30	29	28	27	26	25	24	23	22	21	
01-02	F	F	F	F	F	F	F	F	F	F	01-02
03-06	0	0	0	0	0	0	0	0	0	4	03-06
07-10	0	0	0	0	0	0	0	0	0	7	07-10
11-14	0	0	0	0	0	0	0	0	3	10	11-14
15-18	0	0	0	0	0	0	0	0	5	20	15-18
19-22	0	0	0	0	0	0	0	3	10	30	19-22
23-26	0	0	0	0	0	0	2	6	15	40	23-26
27-30	0	0	0	0	0	0	4	9	20	50	27-30
31-34	0	0	0	0	0	0	6	13	25	60	31-34
35-38	0	0	0	0	0	0	8	17	35	70A	35-38
39-42	0	0	0	0	0	0	10	21	45	80A	39-42
43-46	0	0	0	0	0	0	12	25	55A	90A	43-46
47-50	0	0	0	0	2	15	15	30	65A	100A	47-50
51-54	0	0	0	0	5	20	18	35	75A	110A	51-54
55-58	0	0	0	3	8	25	21	40A	85A	120B	55-58
59-62	0	0	2	6	11	30	24	45A	95A	130B	59-62
63-66	0	0	4	9	15	40	27A	50A	110B	150B	63-66
67-70	0	2	5	12	18	50	30A	60A	120B	170B	67-70
71-74	0	4	10	15	22	60	35A	70A	130B	190B	71-74
75-78	1	6	13	18	30	70A	40A	85B	140B	210C	75-78
79-82	2	8	17	22	37	80A	45B	100B	155C	230C	79-82
83-86	5	11	21	28	41	90A	50B	115B	170C	250C	83-86
-----MAXIMUM RESULT FOR MK 10 WEAPONRY-----											
87-90	8	14	25	33	45	100A	55B	130B	185C	275C	87-90
91-94	11	18	29	38	50	110A	65B	145B	200C	300D	91-94
95-98	14	22	34	43	55A	120A	75B	160C	225C	325D	95-98
99-102	17	26	38	48A	60A	130A	85B	175C	250C	350D	99-102
-----MAXIMUM RESULT FOR MK 20 WEAPONRY-----											
103-106	20	30	43	55A	66A	140B	95C	195C	275C	375D	103-106
107-110	24	34	48A	60A	72A	150B	110C	215C	300D	400E	107-110
111-114	28	38	53A	65A	78B	160B	120C	235C	325D	425E	111-114
115-118	32	42	58A	72A	84B	180B	140C	255D	350D	450E	115-118
-----MAXIMUM RESULT FOR MK 30 WEAPONRY-----											
119-122	36	47A	64A	79B	90B	200B	165C	275D	375D	475E	119-122
123-126	40	52A	70B	86B	98B	220C	190C	300D	400D	500E	123-126
127-130	45A	58A	76B	93B	110B	240C	220D	325D	425D	525E	127-130
131-134	50A	64A	82B	105B	125B	260C	250D	350D	450E	550E	131-134
-----MAXIMUM RESULT FOR MK 40 WEAPONRY-----											
135-138	55A	70B	90B	115B	140B	280C	280D	375D	475E	570E	135-138
139-142	60A	76B	98B	125B	155C	300D	315D	400E	500E	600E	139-142
143-146	65B	83B	108B	135C	170C	320D	350D	425E	530E	630E	143-146
147-150	70B	90B	120C	150C	190C	350D	390D	455E	560E	660E	147-150
-----MAXIMUM RESULT FOR MK 50 WEAPONRY-----											
	30	29	28	27	26	25	24	23	22	21	

Blast criticals

*NOTE: Any critical strike by an atomic warhead delivers radiation criticals of same severity to all ship's crew (unless they are specially shielded).

6.414 Matter/Antimatter Torpedo

Attack Chart for: Matter/Antimatter Torpedo											
	30	29	28	27	26	25	24	23	22	21	
01-02	F	F	F	F	F	F	F	F	F	F	01-02
03-06	0	0	0	0	0	0	2	6	5	10	03-06
07-10	0	0	0	0	0	1	4	9	10	20A	07-10
11-14	0	0	0	0	0	3	6	13	15	30A	11-14
15-18	0	0	0	0	0	5	8	17	25A	40A	15-18
19-22	0	0	0	0	0	7	10	21	35A	50A	19-22
23-26	0	0	0	0	0	9	12	25	45A	60A	23-26
27-30	0	0	0	0	2	12	15	30	55A	70A	27-30
31-34	0	0	0	0	5	15	18	35	65A	90A	31-34
35-38	0	0	0	3	8	18	21	40A	75A	110B	35-38
39-42	0	0	2	6	11	21	24A	45A	85A	130B	39-42
43-46	0	0	4	9	15	24	27A	50A	100B	150B	43-46
47-50	0	2	7	12	18	27	30A	60A	115B	170B	47-50
51-54	0	4	10	15	22	30	35A	70A	130B	190B	51-54
55-58	1	6	13	18	30	34A	40A	85B	145B	210C	55-58
59-62	2	8	17	22	37	39A	45B	100B	160C	230C	59-62
63-66	5	11	21	28	41	44A	50B	115B	175C	250C	63-66
67-70	8	14	25	33	45	49A	55B	130B	190C	275D	67-70
71-74	11	18	29	38	50	55A	65B	145C	205C	300D	71-74
75-78	14	22	34	43	55A	65A	75C	160C	225C	325D	75-78
79-82	17	26	38	48	60A	75B	85C	175C	250C	350D	79-82
83-86	20	30	43	55A	66A	85B	95C	195C	275C	375D	83-86
MAXIMUM RESULT FOR MK 10 WEAPONRY											
87-90	24	34	48A	60A	72A	95B	110C	215C	300D	400E	87-90
91-94	28	38	53A	65A	78B	110B	120C	235C	325D	425E	91-94
95-98	32	42	58A	72A	84B	125B	140C	255D	350D	450E	95-98
99-102	36	47A	64A	79B	90B	140C	165D	275D	375D	475E	99-102
MAXIMUM RESULT FOR MK 20 WEAPONRY											
103-106	40	52A	70B	86B	98B	160C	190D	300D	400D	500E	103-106
107-110	45A	58A	76B	93B	110B	180C	220D	325D	425D	525E	107-110
111-114	50A	64A	82B	105B	125B	210C	250D	350D	450E	550E	111-114
115-118	55A	70B	90B	115B	140B	240C	280D	375D	475E	570E	115-118
MAXIMUM RESULT FOR MK 30 WEAPONRY											
119-122	60A	76B	98B	125B	155C	270D	315D	400E	500E	600E	119-122
123-126	65B	83B	108B	135C	170C	300D	350E	425E	530E	630E	123-126
127-130	70B	90B	120C	150C	190C	330D	390E	455E	560E	660E	127-130
131-134	75B	97B	130C	170C	210C	370D	435E	485E	590E	690E	131-134
MAXIMUM RESULT FOR MK 40 WEAPONRY											
135-138	81B	104C	145C	190C	230D	410E	480E	520E	625E	725E	135-138
139-142	87B	113C	160C	210D	250D	450E	525E	560E	675E	775E	139-142
143-146	93C	120C	175D	230D	275E	490E	570E	600E	735E	825E	143-146
147-150	100C	150D	190D	250E	300E	520E	625E	650E	780E	900E	147-150
MAXIMUM RESULT FOR MK 50 WEAPONRY											
	30	29	28	27	26	25	24	23	22	21	
UM 01-02: Roll 1D10: 1-5 Misfire, projectile lost; 4-9 Launcher jam, roll malfunction severity; 10 premature detonation, roll point-blank attack on ship.											

6.415 Blast Cannon

Attack Chart for: Blaster

	30	29	28	27	26	25	24	23	22	21	
01-02	F	F	F	F	F	F	F	F	F	F	01-02
03-06	0	0	0	0	0	0	0	0	5	10	03-06
07-10	0	0	0	0	0	0	0	5	10	15A	07-10
11-14	0	0	0	0	0	0	0	10	15	20A	11-14
15-18	0	0	0	0	0	0	0	15	20	25A	15-18
19-22	0	0	0	0	0	0	0	20	25A	30A	19-22
23-26	0	0	0	0	0	1	0	25A	30A	35A	23-26
27-30	0	0	0	0	1	3	0	30A	35A	40B	27-30
31-34	0	0	0	0	1	5	0	35A	40A	45B	31-34
35-38	0	0	0	1	1	7	0	40A	45A	50B	35-38
39-42	0	0	1	2	2	9	0	45A	50A	55B	39-42
43-46	0	0	1	2	3	12	0	50A	55B	60C	43-46
47-50	0	0	2	3	4	15	3	55B	60B	65C	47-50
51-54	0	1	3	4	5A	18	5	60B	65B	70C	51-54
55-58	1	1	4	6	6A	21	10	65B	70B	75C	55-58
59-62	1	2	5	8	7A	24	20A	70B	75C	80D	59-62
63-66	2	2	6	10A	9A	28	30A	75B	80C	85D	63-66
67-70	2	3	7	13A	11A	33A	40B	80C	85C	90D	67-70
71-74	3	4	10	16A	13A	38A	50B	85C	90C	100D	71-74
75-78	3	5	11A	19A	15B	42A	60B	90C	95C	110D	75-78
79-82	4	6	12A	21A	18B	46B	70B	95C	100D	120D	79-82
83-86	4	7A	13A	24A	21B	50B	80C	100C	105D	130E	83-86
-----MAXIMUM RESULT FOR MK 10 WEAPONRY-----											
87-90	5	8A	15B	27A	24B	54B	90C	105D	110D	140E	87-90
91-94	6	9A	17B	30B	28C	60B	100C	110D	120D	150E	91-94
95-98	7	10A	19B	34B	32C	64C	110C	115D	130D	160E	95-98
99-102	8A	11B	21B	38B	36C	68C	120C	120D	140E	170E	99-102
-----MAXIMUM RESULT FOR MK 20 WEAPONRY-----											
103-106	9A	12B	23B	42C	40C	72C	130C	125D	150E	180E	103-106
107-110	9A	14B	25C	47C	45C	76C	140D	130D	160E	200E	107-110
111-114	10A	16B	28C	51C	50C	80D	150D	140E	170E	220F	111-114
115-118	11A	18B	31C	55C	55D	84D	160D	150E	180E	240F	115-118
-----MAXIMUM RESULT FOR MK 30 WEAPONRY-----											
119-122	12A	21C	34C	59D	60D	88D	170D	160E	190E	260F	119-122
123-126	13B	24C	37D	64D	65D	92D	180D	170E	200E	280F	123-126
127-130	14B	27C	40D	69D	70D	100D	190E	180E	210F	300F	127-130
131-134	15B	30C	43D	75D	80D	115E	200E	190E	220F	320G	131-134
-----MAXIMUM RESULT FOR MK 40 WEAPONRY-----											
135-138	16B	33D	46D	81E	90E	130E	210E	200F	240F	340G	135-138
139-142	17C	34D	49E	87E	100E	145E	220E	210F	260F	360G	139-142
143-146	25D	37D	52E	93E	115E	160E	230E	230F	280F	380G	143-146
147-150	30D	42E	60E	100E	200E	225E	240F	250F	300F	400G	147-150
-----MAXIMUM RESULT FOR MK 50 WEAPONRY-----											
	30	29	28	27	26	25	24	23	22	21	

UM 01-02: ROLL 1D10: 1-4 Capacitor Overload, gun does not fire; 5-10 roll malfunction severity.

Critical Hits: F = E and A Blast
G = E and B Blast

All regular criticals are Blast

6.416 Laser Cannon

Attack Chart for: Laser Cannon

	30	29	28	27	26	25	24	23	22	21	
01-04	F	F	F	F	F	F	F	F	F	F	01-03
04-06	0	0	0	0	0	0	0	0	1	2	04-06
07-10	0	0	0	0	0	0	0	3	3	4	07-10
11-14	0	0	0	0	0	0	1	6	7	8A	11-14
15-18	0	0	0	0	0	0	2	9	10A	12A	15-18
19-22	0	0	0	0	0	0	4	12A	15A	16B	19-22
23-26	0	0	0	0	0	1	6	16A	19A	20B	23-26
27-30	0	0	0	0	1	3	8	20A	23A	25B	27-30
31-34	0	0	0	0	2	5	10	24A	27B	30C	31-34
35-38	0	0	0	2	3	7	12A	28B	31B	35C	35-38
39-42	0	0	1	4	5A	9	15A	32B	36B	40C	39-42
43-46	0	0	1	6	7A	11	18A	36B	41B	45D	43-46
47-50	0	0	2	8	9A	13	21A	40C	47C	50D	47-50
51-54	0	1	3	10	12A	15	24A	44C	52C	55D	51-54
55-58	1	1	4	12A	15A	18A	27A	48C	56C	60D	55-58
59-62	1	2	5	14A	18A	21A	30B	52C	61C	65E	59-62
63-66	2	3	6	16A	21A	24A	33B	56D	65D	70E	63-66
67-70	2	4	7	18A	25B	27B	36B	60D	70D	75E	67-70
71-74	3	6	10	21A	30B	30B	40B	65D	75D	80E	71-74
75-78	4	7	11A	24A	35B	33B	44C	70D	80D	85E	75-78
79-82	5	8A	12A	27B	40B	36B	48C	75D	85E	90E	79-82
83-86	6	9A	13A	30B	45B	39C	52C	80D	90E	95F	83-86
MAXIMUM RESULT FOR MK 10 WEAPONRY											
87-90	6	10A	15A	33B	50C	42C	56C	85E	95E	100F	87-90
91-94	7A	11A	17A	36B	55C	46C	60C	90E	105E	110F	91-94
95-98	8A	12A	19B	39B	60C	50C	65D	100E	110E	120F	95-98
99-102	9A	13B	21B	42B	65C	54C	70D	110E	115F	130F	99-102
MAXIMUM RESULT FOR MK 20 WEAPONRY											
103-106	10A	14B	23B	45C	70D	58D	75D	120E	120F	140F	103-106
107-110	11B	15B	25C	48C	75D	62D	80D	130F	125F	150G	107-110
111-114	12B	17B	28C	51C	80D	66D	90D	140F	140F	160G	111-114
115-118	13B	19C	31C	54D	85D	70D	100E	150F	150F	170G	115-118
MAXIMUM RESULT FOR MK 30 WEAPONRY											
119-122	14B	21C	34C	57D	90E	75D	110E	160F	160F	180G	119-122
123-126	15C	23C	38C	60D	95E	80D	120E	170F	170G	200G	123-126
127-130	16C	25C	42D	65D	100E	85E	130E	180F	180G	220G	127-130
131-134	17C	27D	46D	70D	110E	90E	140E	190G	200G	250H	131-134
MAXIMUM RESULT FOR MK 40 WEAPONRY											
135-138	18C	29D	50D	75E	120E	95E	150F	200G	220H	270H	135-138
139-142	20D	31D	55E	80E	130F	100F	165F	210G	240H	290H	139-142
143-146	22D	33E	60E	85F	140F	115F	180F	230H	250H	320I	143-146
147-150	25E	35E	65E	90F	150F	130F	200G	250H	270I	350I	147-150
MAXIMUM RESULT FOR MK 50 WEAPONRY											
	30	29	28	27	26	25	24	23	22	21	

Critical hits:
 F = E and A Pierce (seperate rolls)
 G = E and B Pierce " "
 H = E and C Pierce " "
 I = E and D Pierce " "

UM 01-03: ROLL 1D10: 1-3 Capacitor overload, gun does not fire; 4-10 roll malfunction.

6.417 Disruptor

Attack Chart for: Disruptor

	30	29	28	27	26	25	24	23	22	21	
01-02	F	F	F	F	F	F	F	F	F	F	01-02
03-06	0	0	0	0	0	0	0	1	5	3	03-06
07-10	0	0	0	0	0	0	0	3	9	5A	07-10
11-14	0	0	0	0	0	0	0	5	13	10A	11-14
15-18	0	0	0	0	0	0	2	8	17	15A	15-18
19-22	0	0	0	0	0	0	4	12	21A	20A	19-22
23-26	0	0	0	0	0	1	6	16	25A	30B	23-26
27-30	0	0	0	0	1	3	8	20A	29A	40B	27-30
31-34	0	0	0	1	1	5	10	25A	33A	50B	31-34
35-38	0	0	0	1	1	7	13	30A	37A	60B	35-38
39-42	0	0	1	2	3	9	17	35A	41B	70C	39-42
43-46	0	0	1	2	6	12	21A	40A	45B	80C	43-46
47-50	0	0	2	3	9	15	25A	45B	49B	90C	47-50
51-54	0	1	3	4	12	18	29A	50B	53B	100C	51-54
55-58	0	1	4	6	15	21	33A	55B	57C	110D	55-58
59-62	1	2	5	8	16A	24	37B	60C	61C	120D	59-62
63-66	1	2	6	10	19A	28A	41B	65C	65C	130D	63-66
67-70	2	3	7	13	22A	33A	45B	70C	70C	140D	67-70
71-74	2	4	10	16A	25A	38A	49B	75C	75C	150D	71-74
75-78	3	5	11	19A	30B	42A	53B	80C	80C	165E	75-78
79-82	4	6	12	21A	35B	46B	57C	85C	85D	180E	79-82
83-86	5	7A	13A	24A	40B	50B	61C	90D	90D	195E	83-86
MAXIMUM RESULT FOR MK 10 WEAPONRY											
87-90	6	8A	15A	27A	45B	54B	65C	95D	95D	210E	87-90
91-94	7	9A	17A	30B	50C	60B	69C	100D	105D	225E	91-94
95-98	8	10A	19B	35B	55C	64C	73C	105D	110E	240E	95-98
99-102	9A	12B	21B	40B	60C	68C	77C	110D	115E	255E	99-102
MAXIMUM RESULT FOR MK 20 WEAPONRY											
103-106	10A	14B	23B	45C	65C	72C	81D	115D	120E	270E	103-106
107-110	11A	16B	25C	50C	70D	76C	86D	120E	135E	285E	107-110
111-114	12A	18C	28C	55C	75D	80D	92D	130E	150E	300F	111-114
115-118	13A	20C	31C	60C	80D	84D	100D	140E	170E	320F	115-118
MAXIMUM RESULT FOR MK 30 WEAPONRY											
119-122	14B	22C	34C	65D	85D	88D	110E	150E	190E	340F	119-122
123-126	15B	24C	37D	70D	90D	92D	120E	165E	210F	360F	123-126
127-130	16B	26D	40D	75D	100D	100E	130E	180E	230F	380F	127-130
131-134	17C	28D	50D	80E	110D	115E	140E	200E	250F	400G	131-134
MAXIMUM RESULT FOR MK 40 WEAPONRY											
135-138	18C	35D	60E	90E	120E	130E	150E	220F	275F	425G	135-138
139-142	20D	40E	70E	100E	130E	145E	165E	240F	300F	450G	139-142
143-146	25E	45E	80E	110E	140E	160E	180E	260F	325F	475G	143-146
147-150	30E	50E	90E	120E	150E	180E	225F	280F	350G	500H	147-150
MAXIMUM RESULT FOR MK 50 WEAPONRY											
	30	29	28	27	26	25	24	23	22	21	

Critical Hits: F = E and A Pierce (separate rolls)
 G = E and B Pierce " "
 H = E and C Pierce " "

NOTE: Subtract 20 from any attack vs. any construct target utilizing an energy shield.

UM 01-02: Roll 1D10: 1-5: capacitor overload, gun does not fire; 6-10: roll malfunction.

Attack Chart for: Plasma Gun

	30	29	28	27	26	25	24	23	22	21	
01-04	F	F	F	F	F	F	F	F	F	F	01-04
05-06	0	0	0	0	0	10	5	6	0	20	05-06
07-10	0	0	0	0	0	15	10	9	10	40A	07-10
11-14	0	0	0	5	5	20	15	13	20	60A	11-14
15-18	0	0	0	10	10	30	20	17	30	80A	15-18
19-22	0	0	5	15	15	40	25	21	40A	100A	19-22
23-26	0	0	10	20	20	50	30	25	50A	130A	23-26
27-30	0	0	15	25	25	70	40A	30	70A	160B	27-30
31-34	0	5	20	35	30	90	50A	35	90A	190B	31-34
35-38	0	10	25	45	40	110	60A	40A	110	220B	35-38
39-42	0	15	35	55	50	130	70A	45A	130A	250B	39-42
43-46	0	20	45	65	60	150	80A	50A	150B	280B	43-46
47-50	0	25	55	75	70	170A	90A	60A	170B	310C	47-50
51-54	0	35	65	85	80	190A	100B	70A	190B	340C	51-54
55-58	0	45	75	95	90	220A	110B	80B	220B	370C	55-58
59-62	5	55	85	110	100	250A	120B	90B	250C	400C	59-62
63-66	10	65	95	120	120	280A	130B	100B	280C	450C	63-66
67-70	15	75	110	130	130	310B	150B	110C	310C	500D	67-70
71-74	20	85	120	140	150	340B	160B	120B	340C	550D	71-74
75-78	25	95	130	155	170A	370B	180B	130C	370C	600D	75-78
79-82	35	110	140	170A	190A	400B	200C	140C	400C	650D	79-82
83-86	45	120	155	185A	210A	440B	230C	160C	450C	700D	83-86
-----MAXIMUM RESULT FOR MK 10 WEAPONRY-----											
87-90	55	130	170A	200A	230A	480C	260C	180C	500D	750E	87-90
91-94	65	140	185A	225A	250B	520B	300C	200C	550D	825E	91-94
95-98	75	155	200A	250A	270B	560B	350C	225D	600D	900E	95-98
99-102	85	170A	225A	275B	290B	600B	400C	250D	650D	975E	99-102
-----MAXIMUM RESULT FOR MK 20 WEAPONRY-----											
103-106	95	185A	250B	300B	310B	640C	450D	300D	700D	1050E	103-106
107-110	110A	200A	275B	325B	330B	680C	500D	350D	750D	1125E	107-110
111-114	120A	225A	300B	350B	350B	720C	575D	400D	825E	1200E	111-114
115-118	130A	250B	325B	375B	375B	760D	650D	500D	900E	1300E	115-118
-----MAXIMUM RESULT FOR MK 30 WEAPONRY-----											
119-122	140A	275B	350B	400B	400C	800D	750D	600E	975E	1400E	119-122
123-126	155B	300B	375B	425C	425C	850D	850D	700E	1050E	1500E	123-126
127-130	170B	325B	400C	475C	450C	900D	950D	800E	1125E	1600E	127-130
131-134	185B	350B	425C	550C	500C	950E	1050E	900E	1200E	1700E	131-134
-----MAXIMUM RESULT FOR MK 40 WEAPONRY-----											
135-138	200B	375C	475C	650C	550D	1000E	1150E	1000E	1300E	1800E	135-138
139-142	225B	400C	525C	700D	600D	1050E	1250E	1100E	1400E	1900E	139-142
143-146	250C	425C	600D	750D	700E	1100E	1350E	1200E	1500E	2000E	143-146
147-150	300C	475C	650D	825E	800E	1200E	1500E	1300E	1600E	2200E	147-150
-----MAXIMUM RESULT FOR MK 50 WEAPONRY-----											
	30	29	28	27	26	25	24	23	22	21	

UM 01-04: Roll 1D10: 1: fumble; 1-4 Capacitor overload, gun will not fire; 6-10 roll malfunction.

6.42 CRITICALS FOR ROBOTS AND SMALL VEHICLES

	Robots with personal Armor Type	AFV'S and Droids with 'construct' armor types	Criticals for Aircraft	Criticals for Ships
-19—05	Your pitiful attack doesn't phase this grease bucket	A grazing strike. No extra damage.	The craft ignores your feeble attempts. +0 Hits.	Shot ricochets off of plating. Try again.
06—20	Weak blow drains 1-10 hours of operating time. Robot inactive for one round. +3 Hits.	Unit loses 10 of its maneuvering bonus. +5 Hits.	Shot damages dynamics. Maximum speed reduced 50%.	Maneuvering controls jammed until repaired. +10 Hits.
21—35	Data output (audio, readout and printout) malfunctions. Roll for severity. +5 Hits.	Blast damages sensor array. Sensor ability reduced 1 — 10 levels.	Communications damaged by proximity blast.	All sensor equipment damaged by close bursts.
36—50	Recorders knocked out and Severely damaged. +8 Hits.	Solid strike on armor plate. +15 Hits.	Structural integrity compromised. +20 Hits.	Blast to armor belt, +100 Hits.
51—65	Gyra systems Moderately damaged. Robot is at -25 to all maneuvers. +10 Hits.	Deflector screen generator malfunctions. Screens at -25.	Screens knocked down due to generator damage. +5 Hits.	All communications knocked out by a malfunction.
66—79	Punishing strikes over exterior surfaces. Robot takes 15 Hits.	Weapon Installation Targeting damage. 1 installation at -50.	HUD and Missile targeting destroyed. Hope you have good guns.	1 weapon installation destroyed by precision strike.
80	Molecutronic brain damaged. Central processor shuts down; roll for severity. +18 Hits.	Well aimed burst knocks out the power supply. +25 Hits.	Cruel blast knocks out all control systems. Craft is plummeting... +25 Hits.	The power supply shuts down due to damage. +50 Hits.
81—86	Screen generator hit. Defensive shields at -1-100%. +22 Hits.	Blast jams loading mechanism in one launcher. Roll for damage severity.	A malfunction jams all missile launching systems.	1-2 gun installations jam due to damage. +50 Hits.
87—89	One weapon installation damaged. +10 Hits.	Cruel hit immobilizes the vehicle. Motive form damaged.	Engine shut down by insinuating blows. +10 Hits.	Engine damage. The ship is dead in the water. +60 Hits.
90	Armor integrity destroyed. Droid reverts to base AT (13 or 1, depending on type).	The central computer is destroyed in a massive energy overload.	Strike to fuel tank/power supply. Unit will explode in 1-5 rounds.	Blast causes the CPU to shut down due to a malfunction.
91—96	Cruel strike knocks out one equipment interface. The facility malfunctions.	Cargo hold punctured. Occupants take appropriate criticals.	Cockpit strike causes all command personnel to eject.	1-2 cargo holds destroyed.
97—99	Well placed strike knocks out the vocalization center. Oratory +0.	1 gun destroyed by lucky hit.	1-100% of all guns malfunction and will not fire.	1-2 weapon installations destroyed. +100 Hits.
100	Intellect circuitry destroyed. This mechanical vegetable is a sorry sight.	Unit is immobilized and will explode in 1-5 rounds.	Engine falls out of craft. Hope everyone has parachutes.	Penetrating blast to engine room causes chain reaction that will destroy the ship in 1-5 rounds.
101—106	Servos damaged. Manipulate loses 1 — 10 levels.	Environmental Protection Integrity destroyed. Occupants exposed to the elements.	Occupants are no longer protected from the outside environment.	Hit to control area causes occupants to take E impact criticals.
107—109	Cunning attack knocks out motive system. Droid is immobilized.	Blast to computer area. Programs in CPU are erased.	On board computer is destroyed. +15 Hits.	All control systems destroyed by pin point attack.
110	Tin man loses his heart. Power system and distribution destroyed. +50 Hits.	Magazine/Power source hit. Unit disappears in a fiery display.	Hull is neatly dissected. A spectacular pyrotechnics display follows.	A magazine detonation cracks the hull in two. There might be survivors.
111—116	Sensors damaged. Droid is sensor blind. EW and perception loses 1 — 100%.	Rocking strike on armor plate stuns unit 1-10 rounds. +20 Hits.	Brutal blow sends craft spinning. Pilot may maneuver for control each round.	Belt hits stun the ship into inactivity for 1-5 rounds.
117—119	Spirited attack erases all programs running in droid's CPU.	Armor integrity destroyed. Revert to AT1. Too bad. +25 Hits.	Cockpit fills with flames affecting pilot and craft takes 5 Hits per round.	Armor belt destroyed. Ship sinks in 1-5 rounds.
120	Poor machine is quickly rendered down into his component parts.	A puddle of molten metal is all that remains.	Trace elements will linger in the atmosphere for years.	The remaining pieces quickly slip beneath the waves.
	-20 — "A" crit -10 — "B" crit +0 — "C" crit +10 — "D" crit +20 — "E" crit	-20 — "A" crit -10 — "B" crit +0 — "C" crit +10 — "D" crit +20 — "E" crit	-20 — "A" crit -10 — "B" crit +0 — "C" crit +10 — "D" crit +20 — "E" crit	-20 — "A" crit -10 — "B" crit +0 — "C" crit +10 — "D" crit +20 — "E" crit

6.431 Pierce	"A"	"B"	"C"	"D"	"E"
01-05	Pretty light show, but no extra damage.	+ 5 Hits.	+ 8 Hits.	+ 12 Hits.	Random Light Malfunction. + 10 Hits.
06-10	+ 1 Hit.	Random Routine Malfunction. + 10 Hits.	Random Light malfunction. + 12 Hits.	Splattering beams reduce shield power by 10 next turn. + 15 Hits.	Random Moderate Malfunction. + 15 Hits.
11-15	+ 5 Hits.	Severe damage to landing lights. + 20 Hits.	Hull breach: infirmary air leak. All within take Vacuum crits if not out within 3 rounds. + 20 Hits.	Moderate damage to internal communications: intercom out, reducing gunner adds by 20. + 20 Hits.	Moderate Computer damage: computer cannot access programs not already in use + 20 Hits.
16-20	Static causes Random Light malfunction. + 10 Hits.	Moderate damage to power allocation control: current power routing locked until repaired.	Moderate impulse drive damage. If not repaired within 1 hour, the damaged exhaust tube will explode, resulting in Ex. Severe damage to Sublight Drive. + 30 Hits.	Computer access system Moderately damaged; computer Mk effectively cut in half until repaired. + 25 Hits.	Severe damage to stealth systems; they are inoperative until repaired. + 30 Hits.
21-35	Random Moderate malfunction. + 15 Hits.	Light damage to sensor array: "Predict" useless. + 40 Hits.	Beam slices across sensor array: Severe damage renders long range sensors inoperative (computer aid to astrogation negated). + 40 Hits.	Reactor cooling system Severely damaged. If not shut down or repaired, reactor will go critical and explode in one hour, destroying the ship. 40 initial Hits.	Brutal shot enters bridge and utterly destroys helm controls. Pilot takes an "E" Electrocutation critical, and all il bridge take an "A" Vacuum (escalating). + 70 Hits.
36-45	Routine sensory damage causes distortions: "Predict" at -20 until repaired. + 20 Hits.	Severe damage to gunner interface. Pilot bonuses to all weapons annulled until repaired. + 35 Hits.	Hot strike opens one crew stateroom to space. Loose items gone and occupant takes 2 "E" vacuum crits, then 1/round as applicable. + 50 Hits.	Pulsed burst of energy penetrates screens and shorts out bridge Astrogation control. Operator takes a "B" Heat and "C" Electrocutation critical. + 60 Hits.	Rude shot opens Recreation room to space. Bulkhead doors seal; all within take "E" Vacuum criticals. In addition, damaged conduits cause 3 Very Severe random malfunctions. + 100 Hits.
46-50	Beam strikes Energy cannon turret: energy capacitors require 3x normal time to recharge (once/turn) due to Moderate damage. + 25 Hits.	Direct shot causes a random Light malfunction and reduces shield power; shields are at -40 next round. + 40 Hits.	Freak shot into missile tube: missile detonates point-blank if armed. If not armed (or no tubes) random Severe malfunction. + 60 Hits.	Cruel beam pierces hull and Severely damages Shield control. Shields reduced by 30 until repaired. + 75 Hits.	Shields devastated by barrage: Very Severe damage and shields are down until repaired. + 150 Hits.
51-55	Overload shorts out landing gear controls (Light damage). Landing will cause 500 Hits and an "E" Blast critical unless repaired first. + 30 Hits initially.	Piercing beam slices through housing of one Translight nacelle, causing Moderate damage. + 60 hits and drive inoperative.	Strike to nacelle causes Severe damage to Translight drive. Hyperspace travel at 20% normal speed until repaired. + 75 Hits.	Well-aimed shots melt through Translight drive nacelle housing, Severely damaging it. Hyperjump not possible. + 100 Hits.	Very Severe damage to Sublight drive locks steering control in present configuration until repaired. + 180 Hits.
56-60	Strike in computer area: 2 random programs erased and Light damage (computer at 1/2 power until repaired). + 35 Hits.	Lancing shot severs computer lines, causing Severe damage. Mk level cut in half until repairs made. + 70 Hits.	Powerful beam shorts out Astrogation console, delivering Very Severe damage, as well as "B" Electrocutation critical to operator. + 90 Hits.	Beam melts hull and parts of computer storage: 5 random programs lost forever. + 120 Hits.	Intense ray blasts a gun mount: Gun Very Severely damaged, hull breached and compartment losing air. Gunner takes a "C" Electrocutation critical and a "B" Vacuum crit + 120 Hits.
61-65	Lucky hit delivers Moderate damage to missile tracking control: "Predict" useless on all missile/torpedo attacks. + 40 Hits.	Hull penetrated, causing pressure loss in main corridor. Portals seal and all in passage take "C" Vacuum criticals. + 90 Hits.	Cruel ray stabs into shuttle bay, delivering Moderate damage to one craft, and + 60 hits each to ship and shuttle.	Strong needle ray goes through shuttle bay and punctures one shuttle hull. Bay and shuttle are in vacuum. + 150 Hits.	Very Severe damage to all bridge control consoles; all 90% inoperative until repaired and bridge personnel take a "B" Electrocutation critical from electrical overloads. + 150 Hits.
66	Intense beam penetrates shields and pierces hull plating; in vacuum, access doors seal. Aux. reactor is Severely damaged and inoperative. + 100 Hits.	Intense assault overloads shields, melts through hull and devastates helm console in auxiliary bridge. It is Ex. Severely damaged, and if manned, operator takes "E" Electrocutation and Heat crits. All take "E" vacuum, in airless, sealed room. + 150 Hits.	Energy lance opens Sublight engine room, causing Severe damage to drive. It is inoperative. All crew take an "A" Radiation and "B" Vacuum crits, escalating. + 180 Hits.	Brutal fire to gun mount destroys cannon and reduces gunner control to melted mass. Gunner takes "E" Electrocutation and Vacuum (ongoing Vacuum criticals). + 300 Hits.	Well-aimed beam severs Translight drive nacelle cleanly from ship, making Hyperspace travel difficult. Two random Severe malfunctions also result, and ship takes 450 Hits.
67-70	Sweeping beam causes Extremely Severe damage to communications antenna array. + 60 Hits.	Lucky needle-thin shot hits fire control: Missile and torpedo firing at -50 until the Severe damage is repaired. + 60 Hits.	Very Severe damage to one energy gun and control console. Gunner takes one each "B" Electrocutation and Heat criticals. + 100 Hits.	Pinpoint shot causes Very Severe damage to short-range sensors ("Predict" program useless, and all weapons at -30 due to sensor handicap). + 180 Hits.	Hot ray melts one weapon mount and overloads its control system: Extremely Severe damage to gun; gunner takes a "D" Electrocutation and "A" Vacuum (escalating) as air leaks out of compartment. + 180 Hits.
71-75	Translight drive controls Moderately damaged: Ship incapable of Hyperspace travel until repaired. + 80 Hits.	Multiple weak shots succeed only in fusing landing gear in position. Landings with retracted gear are at -100. + 70 Hits.	Penetrating shot severely damages power conduit; all portals are sealed shut (manual override only) until repaired. + 120 Hits.	Freak hit to medical area Very Severely damages 50% of cryogenic berths; occupants will die in 10 minutes unless berths repaired first. + 200 Hits.	Beams penetrate reactor area. Damage is Moderate, drives and + 220 Hits.
76-80	Light Impulse control damage: turn factor is raised by one. + 90 Hits.	Sneaky passing shot connects with Sublight Drive exhaust, delivering Moderate damage. Turn control reduced by one factor until repaired. + 80 Hits.	Heat melts through hull and leaves Cloaking control systems an Extremely Severely damaged mess. + 150 Hits.	Very Severe damage to Sublight drive control reduces ship steering factor by 2. + 235 Hits.	Powerful shot leaves Auxiliary reactor room in vacuum; reactor Extremely Severely damaged, unlucky fools trapped within take "E" Vacuum and Radiation criticals. + 280 Hits.
81-85	Destructive ray burns through hull, severs a power conduit: interior gravity nullified (maneuvers in zero-G), lighting on emergency. Severe damage. + 100 Hits.	Barrage overloads shield control. All shields at -50 for one round. + 90 Hits.	Determined attack pummels shields, reducing their power by 50% for one turn. + 160 Hits.	Shield control overloaded and Severely damaged; forward shields are down, leaving front half of spacecraft unprotected. + 280 Hits.	Raking shots deliver Extremely Severe damage to Sensors, Shields and Communications: all inoperative (sensor damage puts all weapons and Navigation at -70). + 300 Hits.
86-90	Attack gets past deflectors and blasts one Energy cannon: gunner takes "C" Heat and Electrocutation criticals, console shorts out. Very Severe damage. + 120 Hits.	Pinpoint beam connects with gun mount: gun is Very Severely damaged, and gunner takes "A" Electrocutation critical. + 100 Hits.	Energy surge shorts computer circuits: Severe damage, and four random programs lost forever. + 180 Hits.	Ray blasts into bridge, shorting out Navigation and Science/Sensor display consoles. Very Severe damage; operators receive "C" Electrocutation criticals. All in bridge take one "A" vacuum crit + 320 Hits.	Very Severe damage to fire control: guns fire only with individual gunner bonus; unmanned guns and missiles are at -50. + 400 Hits.
91-95	Wiring trunks to computer severed: filaments Very Severely damaged, nullifying "Evade" and "Predict", as well as malfunction detection. + 150 Hits.	Raking spear of energy blazes past shields and slices hull, severing power trunks. Three Very Severe random malfunctions result. + 150 Hits.	Concentrated beam punctures hull, fuses Sciences console (Ex. Severe damage). Operator takes "E" Electrocutation critical, and bridge crew takes "B" vacuum crits (escalating) as air departs. + 210 Hits.	Ravens beams slash through ship: Severely damaged power conduits short out main lighting and Life Support: emergency lights, one hour of atmosphere left. Fire control Severely damaged, cutting power to energy weapons and rendering them useless. + 360 Hits.	Lances of energy strafe spacecraft: Computer and Shield Control are Extremely Severely damaged and inoperative. + 500 Hits.
96-99	Cruel strafing beam overloads shields and penetrates hull. 50% of crew quarters in vacuum; doors seal. Severed power conduits trigger 3 Very Severe random malfunctions. + 200 Hits.	Attack strikes main reactor & delivers Moderate damage; reduced to 1/2 output 'til repaired. Area leaks radiation; all in area take 1 "B" Radiat. crit./turn exposed. + 200 Hits.	Precise hit renders fire control inoperative and Extremely Severely damaged. All energy attacks at -100. + 275 Hits.	Blistering rod of energy perforates hull and fuses reactor controls. Entire ship is irradiated before reactor shuts down. Any unfortunates in reactor room and adjacent areas take one "E" Radiation crit Reactor Extremely Severely damaged + 450 Hits.	Artfully controlled beams stab deeply into ship: Extremely Severe damage to Sublight and Translight drives. Emergency lighting; environmental control Very Severely damaged. + 700 Hits.
100	Pinpoint attack in bridge burns past shields and vaporizes hull plate. Helm console explodes, delivering an "E" Electrocutation critical to pilot. Air leak; portals will seal in 6 rounds. + 250 Hits.	Powerful beam cuts a swath through hull. Impulse Engine controls Very Severely damaged and frozen until repaired). Engine room is in vacuum, portals seal, and crew take Vacuum crits "A". 2 Extremely Severe random malfunctions occur. + 300 Hits.	Raking lance of fire burns through main reactor and Sublight drive areas, delivering Very Severe damage. Crew in those areas take a "C" Radiation critical, "E" vacuum crits. Severed power conduits cause three additional Severe random malfunctions. + 800 Hits.	Sizzling streams of destruction vaporize hull plate and machinery. Sublight engine room is in vacuum, and crew in engine room take an "E" Vacuum, Heat, Impact and Radiation critical. Sublight drive Extremely Severely damaged and useless. + 1500 Hits.	Incredible spear of energy literally cuts ship in half. Roll for exact location of strike. Both halves incapable of maneuver, and all crew take "D" impact criticals, but some may survive. Ship takes 2x maximum hits and all systems Extremely Severely damaged.

6.432 Blast	"A"	"B"	"C"	"D"	"E"
01-05	Zippo	+ 4 Hits.	+ 10 Hits.	+ 15 Hits.	Random Routine malfunction. + 10 Hits.
06-10	+ 1 Hit	Random Routine malfunction. + 10 Hits.	Random Light malfunction. + 15 Hits.	Shield power reduced by 10 for one turn. + 20 Hits.	Shield power reduced by 20 for one turn. + 12 Hits.
11-15	+ 5 Hits	Random Light Malfunction. + 20 Hits.	Severe damage to power conduit: Auxiliary reactor inoperative. + 25 Hits.	Moderate damage to fire control: all beam weapons at -20. + 30 Hits.	Severe damage to one weapon mount. Gunner takes a "C" Electrocutation critical. + 20 Hits.
16-20	Random Light Malfunction; + 10 Hits.	Routine damage to Translight Drive: speed at -50% until repaired. + 30 Hits.	Blast in crew quarters area shorts out door and intercom controls (doors seal). 50% chance slow air leak in one room. + 30 Hits.	Moderate damage to landing struts. Landing maneuvers at -40; failure means gear has collapsed Ex. Severe damage results. 300 additional hits. + 40 hits	Electrifying energy blast overloads several systems: roll 3 Moderate random malfunctions. + 40 Hits.
21-35	Random Moderate Malfunction + 20 Hits.	Light Sensor damage: Range cut by 1/2. "Predict" (if used) is at -30. + 50 Hits.	Severe damage to Bridge main visual display: Pilot skill value reduced by 30. + 40 Hits.	Bridge area blast short-circuits Astrogation console: it is Severely damaged and operator takes "C" Electrocutation critical. + 50 Hits.	Explosive hit near bridge area causes Very Severe damage to Astrogation and Sensors consoles. Both operators take "B" Electrocutation criticals. + 100 Hits.
36-45	Routine Intercom Damage cause gunners to be at -20 until it is repaired. + 10 Hits.	Moderate intercom damage: Gunners at -30 until repaired. + 60 Hits.	Light Sublight drive control damage: turn factor shifted down one until repaired. + 50 Hits.	Moderate Sublight drive control damage: turn factor shifted up two levels until repaired. + 70 Hits.	Severe damage to all bridge control systems: bridge useless. All personnel take "A" Electrocutation criticals. + 150 Hits.
46-50	Shields reduced by 10 until Routine Repair done.	Fiery blast reduces shields by 20 for one turn. + 20 Hits and a random Moderate malfunction.	Powerful strike reduces shield power by 30 for one turn. Additional Random Light malfunction; + 60 Hits.	Energy burst momentarily overloads shield control: they are at -40 for one turn. Moderate random malfunction. + 90 Hits.	Shields overloaded: power drops by 30 for next three turns. Random Severe malfunction. + 180 Hits.
51-55	Blast to Cryogenic area: + 30 hits and Routine damage to 50% of beds. Occupants will die in 1-10 minutes.	Explosion causes Moderate Translight drive damage (one nacelle). + 80 hits and 30% chance Hyperjump impossible.	Severe Translight Drive damage (one nacelle). 80% chance Hyperjump impossible until repaired. + 70 Hits.	Severe Translight Drive damage: Hyperjump impossible. Moderate damage to cargo bay and contents. + 120 Hits.	Blast to engine area causes Very Severe damage to Translight drive. Overload shorts out control systems. + 200 Hits.
56-60	Light computer damage. Reduce Mk. by 1/2 until repaired. + 10 Hits.	Moderate computer damage. If "Evade" used, it is inoperative until repaired. + 30 Hits.	Moderate computer damage: Piloting/Astrogation functions inoperative. + 80 Hits.	Severe computer damage: Mk. at 50% capacity; "Evade" and "Predict" inoperative. + 135 Hits.	Severe computer damage: all but life support is down. + 250 Hits.
61-65	Light damage to life support. Environment lost in 2 hours. + 20 Hits.	Moderate Life Support Damage: environment lost in 2 hours. Shock waves also overload lighting conduit: Severe damage and emergency lighting only. + 80 Hits.	Moderate damage to shuttle bay doors: they are inoperable except manually. + 100 Hits.	Severe damage to shuttle bay: bay doors inoperative and seal broken, bay in vacuum. Random Very Severe malfunction to shuttle(s). + 150 Hits.	Extremely Severe damage to shuttle bay: bay doors crushed and useless; roll two Very Severe rolls on each shuttle. + 200 Hits and + 100 per shuttle.
66	Shuddering blast buckles hull plates. + 100 hits and 2 Random Severe Malfunctions. Pressure leak in auxiliary bridge; bulkheads in vicinity seal.	Energy burst rocks ship. Shields at -30 for 2 turns, and one Extremely Severe Random Malfunction. + 150 Hits.	Impact blast penetrates hull, Sublight engine room in Vacuum. Crew in room take 1 "A" vac. crit./turn. Shields down; Sublight maneuvering locked for 1 turn. + 200 Hits.	Well-aimed blast in bridge area: hull breach and slow leak; bridge will be in Vacuum in 5 turns bridge crew takes increasing Vacuum crits. Pilot takes "D" Electrocutation critical from console overload. + 350 hits.	Shields fail to stop blast: hull vaporizes over Sublight engine room. It and all adjacent sections in vacuum. Crew in engine room take "E" vacuum crits; 1/rnd. Sublight power Ex. Severely damaged. Roll 3 Ex. Severe random malfunctions. + 500 Hits.
67-70	Light damage to fire control: all weapons at -20. + 30 Hits.	Moderate damage to Fire Control system. All weapons at -30. + 50 Hits.	Severe damage to one Energy gun. If manned, gunner takes a "C" Electrocutation critical from console overload. + 110 Hits.	Severe damage to fire control: all weapons (except internal guidance) at -40. + 180 Hits.	Burst over gun mount causes Ex. Severe damage to guns and console. Gunner takes "E" Electrocutation and "B" Heat criticals as console explodes. + 200 Hits.
71-75	Conduit overload: Translight Drive velocity at 1/2 until repaired. + 30 Hits.	Moderate damage to landing gear. Landing maneuvers at -50; failure means gear has collapsed and Extremely Severe damage results. + 80 Hits.	Explosive strike causes Severe structural damage: will cause 1000 Hits and "E" Blast critical upon attempted Hyperjump or planet reentry. + 120 hits.	Crushing burst near reactor triggers power surge: 2 Very Severe random malfunctions occur. + 200 Hits.	Lucky burst near reactor delivers Very Severe damage. Drives and weapons out. Crew in area take one each "B" Electrocutation and Heat criticals. + 250 Hits.
76-80	Routine Sublight drive damage: power reduced by 1 factor. + 40 Hits.	Moderate Sublight Drive damage. Power reduced by one factor. + 90 Hits.	Severe Sublight Drive damage: power cut by 50%. + 150 Hits.	Very Severe Sublight drive damage: power cut by 80%. + 250 Hits.	Concentrated energy blast holes ship and leaves all sick bay and intervening facilities in vacuum. Crew within suffer "E" vacuum criticals. + 300 Hits.
81-85	Shock causes Routine though widespread shield overload: Shields are at -30 until repaired. + 50 Hits.	Moderate damage to shield control: shields at -40 until repaired. + 100 hits.	Severe damage to shields: they are reduced by 50. + 180 Hits.	Very Severe Shield damage: they are at -70. + 300 Hits.	Extremely Severe damage to shields. They are down until repaired. + 340 Hits.
86-90	Moderate damage to one weapons system: all guns of that type at -100 until repaired. + 100 Hits.	Well-placed blast inflicts Severe damage on one gun mount. If manned, gunner takes "B" Severity Electrocutation critical from console overload. + 120 Hits.	Very Severe damage to one weapons system. Gunner takes "C" Electrocutation critical. + 200 Hits.	Incredible blast annihilates one weapon mount completely. Hull breached, bulkheads in vicinity seal. Unlucky gunner takes "E" Heat and Electrocutation, and one "E" vacuum crit per rnd. in area. + 350 Hits.	Incredible burst on gun mount overloads entire weapons system: all guns of that type suffer Ex. Severe damage. Gunner at impact point takes an "E" Electrocutation & a Heat critical, & a "B" vacuum crit. each turn. + 500 Hits.
91-95	Severe computer damage reduces capacity to 1/2 until repaired. + 150 Hits.	Concussion causes short-circuits. Severe computer damage: "Evade", "Predict" and "Astrogation" programs inaccessible until repairs made. + 150 Hits.	Very Severe damage to computer: all systems but life support control are down. Sciences bridge operator takes "B" Electrocutation critical. + 250 Hits.	Extremely Severe damage to computer: it is inoperative except for life support; in addition, 1-10 random programs in database irretrievably lost. + 400 Hits.	One half of computer programs and power destroyed permanently. The remainder is Extremely Severely damaged. + 600 Hits.
96-99	Blast overloads shields: they are at -60 next turn. Two Very Severe Random malfunctions occur. + 200 Hits.	Close proximity blast in engine area causes Very Severe damage to Sublight drive, rendering it inoperative. + 250 Hits.	Brutal pinpoint blast ruptures hull in Auxiliary bridge area: Aux. bridge in vacuum and all consoles are Very Severely damaged. + 300 Hits.	Devastating energy burst delivers Very Severe damage to Translight drive. If nacelles, one is totally destroyed. + 500 Hits.	Point-blank detonation destroys Sublight drives. Explosion delivers "E" Impact, Heat, & Vacuum crits. Bulkhd. doors seal. Ship cannot sublight maneuver. + 800 Hits.
100	Point-blank explosion near bridge area overloads all control consoles; each Very Severely damaged. Operators take "C" Electrocutation crit's. Bridge controls out.	Key burst causes Severe damage to main reactor. It is out. All crew take "A" Unbalance crits due to brief gravity loss during jolt. Emergency lighting only. + 500 Hits.	Ship reels from impact energy burst: crew takes "C" Impact crit's, as gravity, life support, and main reactor are Ex. Severely damaged (drives & weapons out). + 1000 Hits.	Impact blast in reactor area breaches hull in that and all adjacent compartments and triggers fuel overload. Bulkheads seal; all but emergency systems are down. Reactor will explode in 10 turns. + 2000 hits	Rocking blast sends ship spinning. Hit on reactor fuses all related control systems (operators take "E" Electrocutation criticals) and triggers power overload. Reactor will explode — atomizing ship and crew — in 3 turns. + 4000 Hits.

6.51 REPAIR DAMAGE/MALFUNCTION CHART

	ROUTINE (1-5)	LIGHT (6)	MODERATE (7)	SEVERE (8)	VERY SEVERE (9)	EXTREMELY SEVERE (10)	DAMAGE PT. REPAIR PER 25 HOURS
-151	Sad job. Damage/Malfunction becomes Very Severe after 1 round.	Dam/Mal becomes very severe after 1 round.	You deliver 10 pts. of damage to the system. Roll again.	You deliver 30 pts. of damage to the system. Repair on extremely severe column.	You deliver 150 Hits to the system. System is a write off.	System is destroyed (Explosively if possible). 100% crew Casualty rate.	-100 1-100% repair crew casualty rate.
(-150) — (-101)	Dam/Mal becomes severe after 4 rounds.	Dam/Mal becomes severe after 5 rounds.	Dam/Mal becomes extremely severe after 1 minute.	Dam/Mal becomes very severe. After one hour waste 10% CIP.	System is a write off after 2 hours of tinkering.	1 — 100% of repair crew becomes casualties. System destroyed.	-10 Roll for random malfunction
(-100) — (-51)	Dam/Mal becomes moderate after 4 rounds.	Dam/Mal becomes moderate after 6 rounds.	Dam/Mal becomes very severe after 2 minutes.	Dam/Mal becomes very severe after 6 rounds.	Dam/Mal upgraded to extremely severe after 1 hour.	2 members of repair crew takes appropriate "D" critical strike.	-5
(-50) — (-26)	Dam/Mal becomes light after 3 rounds.	20 minutes with 5% CIP. otherwise 30 minutes.	Dam/Mal becomes severe after 1 minute.	3 hours to repair with 10% CIP.	72 hours to repair with 50% CIP.	1 member of repair crew takes appropriate "C" critical strike.	-1
(-25) — 0	You fumble with device for 5 minutes until it is working again.	10 Minutes to repair unit. Unit operates at -25% with a routine malfunction.	40 minutes to repair with 10% CIP. You overload circuits causing a random malfunction.	2 hours to repair with 10% CIP.	48 hours to repair with 50% CIP.	1 — 100 Hits to system. Try again.	0
01 — 20	3 minutes to repair.	8 minutes to repair.	30 minutes to repair damage with 10% CIP. Malfunction repaired — no cost.	90 minutes to repair damage with 10% CIP. 60 minutes to repair malfunction with 10%.	36 hours to repair unit to 50% effectiveness. 48 hours to fully repair. 50% CIP.	Repair may not be attempted until 2 "severe" procedures are completed.	1
21 — 40	2 minutes to repair.	5 minutes to repair. "Routine" malfunction will occur next time system is used.	20 minutes to repair with 10% CIP.	1 hour to repair with 10% CIP.	24 hours to repair with 25% CIP.	200 hours to repair with 50% CIP.	3
41 — 55	1 minute to repair.	5 minutes to repair.	15 minutes to repair with 5% CIP. 25 min. otherwise.	1 hour to repair damage with 10% CIP. Malfunction repaired without cost.	24 hours to repair with 25% CIP.	20 hours to repair with 50% CIP.	5
56 — 65	5 rounds to repair.	5 minutes to repair.	13 minutes to repair with 5% CIP. 25 min. otherwise.	55 minutes to repair damage with 10% CIP. Malfunction repaired without cost.	24 hours to repair damage with 25% CIP. Malfunction repaired without cost.	110 hours to repair to 50% effectiveness. 120 hours to repair fully. 50% CIP.	6
66 — 75	5 rounds to repair.	5 minutes to repair.	12 minutes to repair. Dam/Mal becomes "light" after 1 round.	50 minutes to repair damage with 10% CIP. Malfunction repaired without cost.	18 hours to repair damage with 25% CIP. Malfunction repaired without cost.	110 hours to repair with 50% CIP.	7
76 — 85	4 rounds to repair.	4 minutes to repair.	10 minutes to repair.	45 minutes to repair damage with 10% CIP. Malfunction repaired by two light procedures.	15 hours to repair with 10% CIP.	100 hours to repair with 50% CIP.	8
86 — 95	4 rounds to repair.	4 minutes to repair.	9 minutes to repair.	40 minutes to repair with 5% CIP.	15 hours to repair with 10% CIP.	90 hours to repair damage with 50% CIP. Malfunction repaired without cost.	9
96 — 105	3 rounds to repair.	3 minutes to repair.	8 minutes to repair.	40 minutes to repair.	13 hours to repair damage with 10% CIP. Malfunction repaired without cost.	Repair reduced to 2 "moderate" procedures.	10
106 — 115	3 rounds to repair.	2 minutes to repair.	7 minutes to repair damage. 6 minutes to repair malfunction.	30 minutes to repair with 5% CIP. 40 minutes to repair otherwise.	10 hours to repair unit to 50% effectiveness. 11 hours to repair fully. 10% CIP.	80 hours to repair with 50% CIP.	11
116 — 125	2 rounds to repair.	2 minutes to repair.	You isolate 3 "routine" procedures to repair unit. Start next round.	30 minutes to repair.	8 hours to repair. 10% CIP.	70 hours to repair damage with 50% CIP. Malfunction repaired without cost.	12
126 — 135	2 rounds to repair.	6 rounds to repair.	5 minutes to repair.	25 minutes to repair.	5 hours to repair. 10% CIP.	70 hours to repair damage or 60 hours to repair malfunction. Both have 25% CIP.	15
136 — 145	You may use equipment next round.	4 rounds to repair.	Unit at -25% in 3 minutes. Unit repaired in 5 minutes.	20 minutes to repair.	5 hours to repair. 10% CIP. Malfunction is downgraded to severe.	60 hours to repair to 50% effectiveness. 70 hours to repair fully. 25% CIP.	20
146 — 155	Unit ready next round.	3 rounds to repair.	Unit at -50% in 6 rounds. Unit repaired in 5 minutes.	20 minutes to repair damage. Malfunction repair is 3 routine procedures.	4 hours to repair. 10% CIP.	50 hours to repair with 25% CIP.	25
156 — 165	Unit ready. You have ½ of the round left.	2 rounds to repair.	3 minutes to repair.	Downgrade repair to moderate after 5 minutes.	3 hours to repair. 10% CIP.	Procedure reduced to 2 "severe" repair procedures.	30
166+	Quick adjustment. You have the full round to act.	1 round to repair.	2 minutes to repair.	10 minutes to repair.	Reassessment of systems shows 2 "light" repairs are required.	40 hours to repair with 25% CIP.	50

Notes: if only one person is working on a repair (other than Routine), double the times listed.

Notes: double the necessary time if no repair scanner or diagnostic computer is used during the repair.

CIP refers to Cost-in-Parts. This is the indicated percentage of the parent unit cost which must be invested to bring about the desired repair.

6.52 RANDOM MALFUNCTION TABLE

- 01 — N-Space maneuver control (Ship cannot turn)
- 02 — Hyperspace Astrogation control (-20% to plot success).
- 03 — Hyperspace Astrogation control (-80% to plot success).
- 04 — Helm sensor display (No Combat Pilot DB).
- 05 — Command astrogation / sublight navigation (Reduce max acceleration 25%).
- 06 — Command astrogation / translight plotting (Destination co-ordinates lost).
- 07 — Command astrogation / sublight plotting (No destination co-ordinates available).
- 08 — Command astrogation / translight plotting (-50% to plot success).
- 09 — Central energy cannon fire control (guns can only be fired from local gunner consoles).
- 10 — Central energy cannon fire control (guns can only be fired from local gunner consoles).
- 11 — Central missile launch control (Missile batteries on local fire control only).
- 12 — Deflector shield control (Shields reduced by 10 until repaired).
- 13 — Deflector shield control (Screens down until repaired).
- 14 — Deflector shield control (Lose option of doublescreening).
- 15 — Sensor / computer analysis display (Sensors inoperative).
- 16 — Computer data retrieval (All programs in storage are at - 10%; all those in reserve storage require double time to retrieve).
- 17 — Computer program transferal (Computer cannot run programs not already in processor — all programs in either storage inaccessible).
- 18 — N-Space drive control (Reduce max acceleration 50%).
- 19 — N-Space drive control (Ship moves erratically. Very dangerous in critical situations).
- 20 — Translight drive control (No jumps possible. If already in hyperspace — go sub light).
- 21 — Translight drive control (Ship at 50% translight rating).
- 22 — Power distribution control (Power allocations locked until repairs made).
- 23 — Environment control (temp raises + 1 degree per minute until repaired).
- 24 — Environment control (-1 degree per minute).
- 25 — Environment control (Lose environment in 6 hours).
- 26 — Intercom inoperative (gunners and engineering at -10).
- 27 — Lighting in a command area — emergency lights only.
- 28 — Lighting in a support area — emergency lights only.
- 29 — Lighting in a passenger area — emergency lights only.
- 30 — Cryogenic life support (1 — 100% of berths affected. Occupant has 10% chance of dying per hour).
- 31 — Tachion communications (Sending and receiving both at -50).
- 32 — Laser communications (Sending and receiving both at -50).
- 33 — External visual monitors inoperative.
- 34 — Sensors at half range.
- 35 — Sensors out of alignment (-50 due to ghost images).
- 36 — Sensors (Totally blind).
- 37 — Central HUD unit (Only local HUD units may be used; if central gunnery control used, it is without HUD bonus).
- 38 — N-Space drive power conduit overload (Reduce max acceleration by 75%).
- 39 — Translight drive power conduit overload (Reduce rating by 50% and Pilot maneuvers by 20).
- 40 — Overheating triggers N-Space drive shut down (If severity is 'routine' — treat as 'no malfunction').
- 41 — Translight drive shutdown (If severity is 'routine' — treat as 'no malfunction').
- 42 — Power feed imbalance to reactor core (Power output reduced 50%).
- 43 — Power feed imbalance to reactor core (Fuel consumed at 1 — 10 times the normal rate).
- 44 — Power distribution from core (It is 'routine' to divert distribution to aux circuit).
- 45 — Power core coolant leak (1% chance per minute cumulative that drive unit goes critical if left running).
- 46 — Power core radiation shielding leak (Area flooded with 'D' severity radiation).
- 47 — Air circulation (1 — 10 hours of environment left).
- 48 — Air purification (2 — 20 hours of environment left).
- 49 — Humidity control (1% chance cumulative per hour of another malfunction occurring).
- 50 — Waste recycling (Must use tanked water. Hydroponics will die in 1 — 5 days).

- 51 — Gravity control failure (Zero G conditions; if ship uses gravitics for maneuvering, it cannot until repairs are made).
- 52 — Medical system (Random system in sick bay or dispensary).
- 53 — Bulkhead portal control (Portals locked in present position).
- 54 — Flame detection and control (1 — 100% loss in detection and dampening efforts).
- 55 — Workshop mechanical system.
- 56 — Target tracking system (All long range targeting at -50).
- 57 — Target acquisition (1 — 100% of weapon instalations lose directional aid from sensors).
- 58 — Data bank (No new programs may be moved to Processor).
- 59 — Data bank (1 — 100% of programs in data bank are erased).
- 60 — N-Space astrogation by computer (Increase course plotting time by a factor of 10).
- 61 — Hyperspace navigation by computer (Lose course accuracy bonus for computer).
- 62 — Engagement of translight engines (No computer direction for hypershunts available).
- 63 — Translight astrogation by computer (Minus 1 — 100% on hypershunts pilot roll).
- 64 — Computer gunnery control (Lose computer bonus on fire).
- 65 — Central computer — gunner interface (Lose commanding gunner's fire bonus).
- 66 — Malfunction detection (Warning systems inoperative).
- 67 — Local fire control — gunner interface (One installation loses gunner's fire bonus).
- 68 — Local fire control — gunner interface (1 — 100% of installations lose gunner bonuses).
- 69 — Central HUD (Lose main HUD bonus).
- 70 — Local HUD unit (One installation loses HUD bonus).
- 71 — Local HUD unit (1 — 100% of installations lose HUD bonuses).
- 72 — Energy cannon turret power (Cannon locked and inflexible; cannot track targets).
- 73 — Energy cannon ranging (-50% on range for one turret).
- 74 — Energy cannon ranging (-50% on range for all instalations).
- 75 — Energy cannon capacitors (Double time to recharge each installation).
- 76 — Energy cannon capacitors (Power to recharge one instalation is 1 — 10 times normal).
- 77 — Energy cannon capacitors (Power to recharge all instalations is 1 — 10 times normal).
- 78 — Missile firing circuit (One installation affected — no firing possible).
- 79 — Missile firing circuit (1 — 100% of installations incapable of firing).
- 80 — Missile launcher (One installation will not fire).
- 81 — Missile launcher (One launcher fires at half rate).
- 82 — Missile launcher (Premature detonation of next missile fired by launcher. Roll point blank attack on firing ship).
- 83 — Missile magazine (Missiles will not feed into a launcher; it is inoperative).
- 84 — RIF generator inoperative; ship is incapable of hypershunts or normal N-space acceleration. N-Space acceleration change is limited to .001 km per round.)
- 85 — RIF Generator (generator at half power: N-space acceleration halved and hypershunts impossible).
- 86 — EW (Reduce rating by 1 — 10).
- 87 — EW (Reduce rating by 1 — 100).
- 88 — EW (Allocations locked in and controls frozen).
- 89 — Fuel bay (1 — 100% of remaining fuel can not be accessed).
- 90 — Hanger access (Bay door/barrier field locked in present state).
- 91 — Food supply Hydroponic environment (Hydroponic growth will die in 1 — 100 hours).
- 92 — Lab (Current experiment / research will be ruined in 1 - 100 hours).
- 93 — Tractor beam (Range reduced 50%).
- 94 — Tractor beam (Unusable).
- 95 — Running lights out.
- 96 — External flood / landing lights out (Landing at night at - 50).
- 97 — Air lock (Jammed in present position).
- 98 — Helm console (No piloting from this location)
- 99 — Bridge Engineering console (Power allocation and monitoring cannot be done from this location).
- 00 — Special (New or other system not listed).

If severity is unspecified roll (1-5) Routine, (6) Light, (7) Moderate, (8) Severe, (9) Very Severe, (10) Extremely Severe.

6.53 MASS VEHICULAR INITIATIVE CHART

Factor	Numeric Range	Notes
Performance	-100 — +100	Unit's overall skill at performing as a unit.
EW Rating	0 — +200	The difference in ratings of opponents both possess EW.
Terrain Advtg.	+5 — +50	Given to vehicles specifically designed for (or at least more closely adapted to) prevalent terrain.
Tech Advtg.	+5 — +100	GM discretion: given to higher tech combatant.
Morale	0 — +20	Elite Troops; Inspired troops
HUD's	0 — +20	For weapons systems with HUD's
Surprise	+100	
Hidden	+50	
Rear Attack	+30 — +50	Ground-to-ground only
Flank Attack	+10 — +30	Ground-to-ground only
Mtd Attack vs. Unmtd Def.	+20 — +100	Bonus varies depending on "mounted" (gravitic AFV's get a bigger bonus than horses)
Subsonic vs. Hypersonic Aircraft	+30	
Attacker above Def.	+20	Not used in Aircraft/anti-aircraft combat
Opponent in Formation	+10	
Commander Morale Bonus	0 — +50	Only used if a particularly important leader is present (Famous general; Duke of a house, etc.)
Die Roll		Open-ended; one per round.

All factors are added, and energy fire proceeds along from the highest initiative bonus to lowest. No attacks are simultaneous in Non-starship vehicular combat.

7.0 VEHICULAR MANEUVERING AND OPERATION

All driving, steering or other maneuvering control of any vehicle, whether it be a bicycle, car, ship, airplane or starship, is done using the Vehicular Maneuver Table. A few assumptions are made in this section regarding skills. The skills of AFV Crewmember and Combat Pilot refer to combat skills in **Future Law** specifically relating to piloting under enemy fire and in tense situations. If **Tech Law** is being used without **Future Law**, the GM may wish to simply ignore the penalties relating to not having these skills.

7.1 USING THE VEHICULAR MANEUVER AND ASTROGATION TABLE

For piloting, choose the column which most accurately reflects the vehicle being operated. If Astrogation, choose either N-Space (any orbital, in-system or intersystem sub-light plot) or Hyperspace (any faster-than-light course plot), to be used only outside of a system.

Next, the GM must determine the severity of difficulty of a chosen maneuver/course plot, and all other pertinent factors. A roll is made and the result cross-indexed. Most of the text results are fairly self-explanatory, although some GM extrapolation may be necessary. If only a number (%) is given, it must be interpreted in direct reference to a maneuver. Normally, one roll is made per hour in any type of vehicular — including air and space ship — transportation, with appropriate modifications. (Any special maneuvers require an additional maneuver roll.) No in-flight hyperspace rolls are made once the shunt is achieved.

When rolling the hourly/daily movement roll, a result of 100% means that the craft has travelled the exact distance it should according to the chosen speed by the PC. A lesser or greater percentage indicates the percentage of the supposed distance actually travelled at that velocity (within reason). The possible game-terms reasons for the fluctuations are myriad: head/tail-winds, other weather, traffic, poor road conditions, etc.

When a special maneuver roll is called for and the result is a percentage, it usually indicates the percentage of the maneuver which has been completed in the given time-span (usually one ten-second round). More than 100% indicates that the move has been done in less than ten seconds (200% means it took 5 seconds, for instance). If less than 100% is achieved, another roll is required, and with it the additional time is consumed. Note that Hyperspace piloting, and all Astrogation maneuvers require an average of one turn (6 rounds) — though there are exceptions, especially in Astrogation; see the section below dealing specifically with it.

General Modifications:

(For Driving/Piloting/Astrogation maneuvers)

Routine	+30
Easy	+20
Light	+10
Medium	0
Hard	-10
Very hard	-20
Extremely Hard	-30
Sheer Folly	-50
Absurd	-70
Insane	-100

Driver/Pilot/Astrogator Condition:

25-50% of Hits taken	-10
51-75% of Hits taken	-20
76-up Hits taken	-30
For each Hit/rnd bleeding	-5
Each limb out	-10 (or more, depending)
Stunned	-50
Drunk	-50

Vehicle Damage:

Vehicle damage other than concussion hits is usually directly indicated by the critical hit. Any vehicle over 'max hits' is inoperative and helpless (ships are dead in the water, planes fall from the sky). In the case of starships, when a spacecraft goes over max hits (the number equal to the tonnage of the craft) the structural integrity of the hull and frame is lost. No specific additional damage is done, but if the ship attempts to maneuver, enter Hyperspace, enter a planetary atmosphere, or, additionally, land within a gravity field, it must roll on the ship maneuver table, the *Damaged* column. Pilot

skill level will be a modifier, of course. After a roll is made on the *Damaged* column, the actual maneuver roll may be made, with any applicable modifications. Any additional damage indicated from the *Damaged* column roll is immediately applied.

Random Malfunctions/Damage, as designated in this table, are rolled as follows: first, roll 1d10 to determine severity (if severity not indicated in the actual maneuver/critical). 1-5: Routine, 6: Light, 7: Moderate, 8: Severe, 9: Very Severe, 10: Extremely Severe. Second, roll on random malfunction table, re-rolling if the result is inapplicable. If a malfunction severity is already designated on this table, ignore the first step here.

Guidelines for Driving/Marine Pilot Maneuver Modifications

Driving: -10 if surface wet; -30 if snowy; -50 if icy.

Marine: -5 for every meter of wave height; -5 for every 10 kph of wind, including gusts.

GENERAL:

Visibility: -5 for every 100m < 1 kilometer, unless 'Zero' visibility, in which case, -50 (not cumulative with night).

Surface conditions: (if surface vehicle) -10 if surface wet; -30 if surface covered in snow, -10 more for every 10cm; -50 if surface icy and slick.

Precipitation: -10 if raining; -20 of sleet, snow or hail (more if heavy).

Night: -10 Assuming vehicle has adequate lights; if not, -50

Ship under fire/engaged in combat: -25 (assuming driver does not have AFV crewmember pilot skill. If he does have that skill, it should be used instead of the regular driving/piloting skill).

Speed: Naturally this is a very important factor (making a hairpin turn at 120 kph is more dangerous than traveling in a straight line at 10 kph). Where a speed limit is posted, very generally, -1 for every 2 km over the limit is applicable. Since the 'safe' max speed will vary so much depending on the vehicle used and the maneuver though, the GM should assign danger factors based on the situation and vehicle, extrapolating from these examples:

EXAMPLE: *Sanvoc is driving his late-model sportscar on an average asphalt highway. The car is a typical inflated-tire vehicle, max speed 250 kph. Sanvoc is being pursued by hostiles in a low-flying gravitic craft, who are firing at him. It is night (Sanvoc has no special vision — the car of course has headlights) and raining. The safe posted speed limit is 160 kph. Sanvoc has 10 skill levels in driving a car and an AG/QU stat bonus of +15, so starts with a +65. Due to the superior handling qualities of the car, the GM grants Sanvoc an additional +20. However, rain subtracts 10, night 10, and wet road 10. He is also under fire and has no AFV Crewmember: driver (combat driver) skill picks, so -25. Total subtractions: -40. Sanvoc's general net add is 45. Driving along a straight highway (all else aside) at the speed limit is **Routine**, adding another 30, so making the maneuver of regular driving under these conditions will be at +75. Checking the Driving/Marine Pilot column of the Pilot/Astrogation Table, we see that Sanvoc needs to roll above a -15 ($75 + [-15] = 60$) to be completely (if unimpressively) successful.*

*Sanvoc, however, fears that regular cruising is not evasive enough to elude his pursuers. He accelerates to 220 kph. (60 over the limit) reducing his bonus by 30, so it is now 45. Sanvoc's adversaries are still closing, and their shots nearer, so he decides to attempt a daring maneuver: turn off his headlights, then slam on the brakes, spinning the car around 180 degrees, hoping to lose them as he heads the opposite way. No lights reduces his bonus by 40, and the GM determines his spin maneuver to be (ignoring all the environmental factors, which are already incorporated!) **Extremely Hard**, which is 60*

worse than Routine. Sanvoc is at -55. He needs to roll an unmodified 115 to be completely successful. Less than complete success (a percentage, rather than an unpleasant specific failure) may mean he only spun partially, or something similar. However, this will increase the total duration of the maneuver (he needs to roll again to complete the remainder) giving his attackers a chance to figure out what is going on.

Guidelines for Atmospheric and in-atmosphere Orbital Maneuver Modifications

Winds: -5 for every 10 kph, including gusts.

Visibility: -5 for every km < 10 kilometers, unless Zero visibility, in which case, -50.

Precipitation: -10 if raining; -20 of sleet, snow or hail (more if heavy).

Night: -20 (unless special vision).

Landing area not paved/well delineated -30

Pilot has landed here before +20

Landing at night without lights -20

Ship under fire (Pilot does not possess **Combat Pilot Skill**) -25.

Guidelines for N-Space Piloting Maneuver Modifications

Any of the general Pilot Condition Factors listed above.

Ship under fire (Pilot does not possess **Combat Pilot Skill**) -25.

Autopilot Program used: +50 (not useable in a combat or special maneuver situation; assumes Astrogation plot laid in).

Physical hazards: variable, depending on situation. (Piloting through a dense asteroid field would be a series of *Sheer Folly* to *Ab-surd* maneuvers.)

No course plotted: ('flying by the seat of your pants') -50. Note that this penalty is only applicable for complex or involved courses, such as astrogating across a star system. Also, astrogation is inapplicable for combat; in that case the *Combat Pilot* skill is employed (if the pilot has no combat pilot skill and finds himself in combat, he is at -25 (the usual penalty when no skill picks have been made in an area).

EXAMPLE: *Jym-bob, aboard the Flying Merino and trying to evade officers of the Law after a misunderstanding, enters an asteroid field, hoping they are too cowardly (or reasonable) to follow. Since a course as variable and complex as this is not plottable by any known astrogation methods (GM decision), Jym-bob must fly by the seat of his pants (-50). It is also Sheer Folly (-70); and he is under fire and does not have **Combat Pilot** skill (-25). Jym-bob is now at -145. He has a total Piloting bonus of 90, and so is at -55. The GM takes into account the width of the asteroid field and how fast Jym-bob is going, and figures how many turns it will require to get through. Jym-bob must roll every turn. For each roll of 100%, he has successfully navigated the field for the given distance. For a roll of greater than 100%, the GM adds the extra as bonus distance travelled. For a roll of below 100%, the GM decides that not only is the distance less than 100%, but for every 10% less than 100, the ship is struck by an asteroid (Nonexplosive projectile). So, if Jym-bob rolls a 36, he subtracts 40 and gets -4. The table indicates no movement. The **Flying Merino** takes ten projectile strikes and gets nowhere. Hope your deflectors are up, Jym-bob.*

As can be seen from the example, there are many game possibilities, and the GM must extrapolate from the table data given. One additional note regarding the example above: If Jym-bob had an EW rating, it would not be useful as a DB against asteroids (they're hard to fool).

Hyperspace Piloting Factors:

Any of the applicable general Pilot Condition Factors listed above.

When entering Hyperspace, if the ship is under fire, pilot is at -20.

Attempting to Enter Hyperspace while in a Gravity Well. A Gravity Well is defined as within 500 x the diameter of any sizeable celestial body, such as a planet or star. In the Sol system, for example, outside Sol's gravity well is just inside the orbit of Jupiter will subtract from the Pilot Maneuver Roll. For every 20 diameters within the Well, roll one Random Malfunction on the ship due to structural strain, e.g., attempting to hypershuttle only 420 diameters away would cause 4 Random malfunctions. In addition, for every 100 diameters less than 500 that a ship hypershuttles, roll an "A" Pierce critical. Thus, a ship attempting to shunt while 100 diameters away from a sun would suffer 20 Random malfunctions and 4 "A" severity Pierce criticals. If any of the malfunctions or crits indicates Translight Drive shutdown, the ship fails to shunt entirely (but still suffers the damage).

Piloting Maneuvers — using a **Hyper-Jump** program — to enter/exit hyperspace (under no pressure) are *Medium*, and a percentage value means the percent of the way through Hyperspace shunt preparation the pilot is. Attempting Hyper-jump under the same circumstances without a program is *Very hard*. On the average it requires one turn (6 rounds) to time of shunt. The actual Hyperspace shunt does not occur until you achieve 100%.

If the pilot rolls less than 100% in his attempt to drop out of hyper, each turn of delay from the correct time (as calculated by the Astrogator) displaces the ship a massive (in sublight terms) distance, usually the equivalent of hundreds of days travel at full sublight velocity — more or less, depending on individual ship engine ratios. Naturally, the only reasonable thing to do is have the Astrogator plot a new (very short) Hyperspace course to get the ship closer. This will require all the normal calculations and rolls.

Astrogation:

The base speed to plot an N-Space or Hyperspace course is one minute (one turn or six rounds). This time applies to course plotting difficulty up to *Medium* (and *Insane*). *Hard* to *Extremely Hard* courses have a base time requirement of one hour, and *Sheer Folly* and *Absurd* course plots have a base of one day.

The course is plotted and ready to implement when a total of 100% is achieved, no matter how many rolls (assuming one roll equalling one minute) it takes. Astrogation is only rolled at the beginning of each plotted journey. Astrogation is assumed to be *Medium*, unless the appropriate preset course tape (then it is *Routine*) or star chart (*Easy*) is used. If no Astrogation computer program is available, Astrogation becomes *Very Hard*. Also, any journey under 50 LY is unmodified, but for every 1 LY more than 50 attempted in one jump, add 5 to the complexity of the course plot.

An N-space course must be plotted every time a 'significant' interplanetary space is traversed (leaving planetary orbit and the solar system is 'significant'; changing ship orbit attitude is not) to prevent a severe (*Sheer Folly*) detriment to pilot maneuver. Combat maneuvering does not require astrogation, as it is done in relation only to adversary ships and does not relate to long-range courses or large, gravity-exerting bodies.

A Hyperspace course must be plotted for every Translight shunt. As mentioned above, any Hyperspace plot made to exit/enter within a system or attempting to initiate Hyperspace piloting within a solar system/star gravity well is very dangerous. Attempting to Hyperspace shunt without a course is not only *Insane*, it is probably doomed to disaster. If this somehow occurs, roll percentile dice. The number is how many light-years are traversed before the ship can return to N-Space.

Note that some very bad Astrogation rolls result in a course plotted in the usual time (usually 6 rounds, as indicated by the 100% in parenthesis at the beginning of the text) but something very wrong occurs along the route. Players theoretically are unaware of the problem until it is upon them.

31 — 45	70%	70%	70%	70%	70%	70%	The ship fights back. No damage, but the manual bypassing necessary puts you at -70.
46 — 55	90%	90%	90%	90%	90%	90%	Hull breach in the cargo bay; 1 random Severe malfunction. Maneuver at 40.
56 — 65	100% You succeed (barely).	100%	100%	100%	100%	100%	The computer link to your console is severed and you must act without it. Apply appropriate modifier.
66 — 85	100%	100%	100%	100%	100%	100%	The ship lurches; all not stopped in suffer a "B" severity Unobscure critical as you attempt your maneuver at -50. +300 hits to the ship.
86 — 105	110% You have time to sigh with relief.	110%	110%	110%	110%	110%	You push her to the brink. 3 random Moderate malfunctions; your roll is at 40. The ship takes 100 hits. Your engines hold the ship together with a prayer and electro-papercraps. Make your roll at 30.
106 — 125	110%	110%	110%	110%	110%	110%	Make this maneuver with no modifiers, but whatever drive system employed is severely damaged afterward.
126 — 145	120%	120%	120%	120%	120%	120%	Your attempt is at -30; the ship suffers 50 hits.
146 — 165	120%	120%	120%	120%	120%	120%	The crippled craft only has one Moderate malfunction while you attempt this maneuver at -20.
166 — 185	130%	130%	130%	130%	130%	130%	You attempt the maneuver at no subtraction, but the console gives you an "A" severity Electrocution critical.
186 — 200	150%	150%	150%	150%	150%	150%	Grace under pressure: you actually receive a +30 bonus to your maneuver; though the ship suffers 2 random Light malfunctions.
201 — 225	150% Great move. Add 10 to all crewmembers' rolls for the next 3 rounds.	150% Skillfully executed. Your friends are impressed. You get to add 20 to all rolls for the next 3 rounds.	150% Your allies think you're running a clinic; all shipmates get to add 20 to all rolls for the next 3 rounds.	150% Apparently even the ship was inspired.	200% Only half the normal time and the course is plotted. The pilot gets a 30 bonus.	200% It takes you but half the regular time. Truly a whiz.	A swift kick to the console corrects one random malfunction; you may attempt the maneuver at no (additional) subtraction.
226 — 275	200% Artful maneuver displays your mastery of the vehicle. Add 20 to all friendly rolls for the next 4 rounds.	200% Superbly done. You have half the round left to act, and the out-of-control rush lets you do it with speed (one full round of activity).	200% You showed them! Any and all foes must subtract 50 from their rolls for the next 2 rounds as they gaze at your artful moves. Major time.	150% You urge every joule of energy possible from the ship. Add 20 to your next Hyperspace Pilot roll.	400% In a flash you lay in the correct course, requiring only a third the normal time.	300% With flying fingers and agile brain you lay in the course in only a third the normal time.	Truly amazing. You need not even roll the maneuver; it succeeds; and any random two malfunctions (not damage) are miraculously repaired.
276 +	200% Brilliant move. Your intuitive ability earns you a free "hobby" skill level in piloting this type of vehicle. Your crewmates are inspired and add 30 to all rolls for the next 6 rounds.	200% Stunning move — literally. Any non-friendly observers are stunned for 3 rounds.	200% Adrenalin (or whatever you're on) is a wonderful thing. You and your shipmates get to add 30 to all rolls for the next six rounds, and you have the second half of this one to act.	200% Zap! If just entering or leaving Hyperspace, any non-friendly observers are surprised and stunned for 3 rounds.	600% You barely need the computer's help; one sixth the usual time and it is done. The pilot may attempt to implement the course this turn if he is alert and willing to subtract 10 from his roll.	600% Almost too fast for the computer; you have the course ready in but one round. Your intuitive skill gives you a free "hobby" skill level in Hyperspace Astrogation.	

7.2 THE VEHICULAR MANEUVER AND ASTROGATION TABLE

	Driving/ Marine Pilot	Orbital/ Atmospheric Pilot	N-Space Pilot	Hyperspace Pilot	N-Space Astrogation	Hyperspace Astrogation	Damaged
-201	Total disaster. You flip your vehicle (direction and severity of impact dependent on velocity and situation). Most likely it is badly damaged as you might well be: Vehicle should roll on the Small vehicle Critical Hit table, severity determined by GM.	Unbelievably inept attempt at controlling the ship effectively (deactivates its propulsion system. Only a 100% successful Abund maneuver by somebody on board can save you from a fiery death as the craft plummets to earth. Roll 1-4 (GM discretion). E: appropriate vehicle crit. Criticals on the ship when it hits. Sorry.	Incredibly moronic maneuver. You try to engage the course plot before it is laid in and the entire Astrogation system shorts out. Very Severe damage, and the ship hurtles in a random direction at full sublight acceleration until the Astrogation console is repaired or overridden.	In a move of unparalleled, panicked stupidity, you believe the hyperspace engine(s) are about to overload, and jettison them from the ship. (If they are not the jettisonable type, you dump the translight fuel). Roll for % of way into journey you do this. It's a long road home at sublight...	Absolutely unbelievable. You short-circuit the Astrogation console, and in the process erase every astrogation program, stor map, and pre-set course in the database. All astrogation is disabled until the console is repaired, and Very Hard other that due to lack of computer aid. Have a nice orbit decay.	(100%) Soy your prayers. Your course sends the ship right through a solar system. Only if the pilot rolls a total of above 200 does he notice the glaring error before entering Hyperspace. If not, roll % of the way through the journey you hit the system, at which point the ship takes a 20 random Pierce Critical hits from debris before the computer drops you out of Hyper.	And you thought it couldn't get worse. Several key structural members buckle; the ship takes half-again max. hits as 10 random. Extremely Severe malfunctions occur. All drive controls short out; nearly every compartment is leaking air. Your ship is dead in space; don't even bother to try the maneuver.
(-200) — (-151)	You lose control of your vehicle and it veers wildly. If anything is within 50m (in a direction reasonable considering current craft motion) you hit it before you can recover. You are stunned 3 rounds (if not dead sooner).	Your clumsy fingers Severely Damage the main Pilot console (it is useless until repaired). 50% chance the ship continues in the maneuver; it was previously in; 50% it makes a totally random maneuver.	In an underlever move, you override the safety systems and engage the wrong drive. Roll a new maneuver on the Hyper-space column, using of course the Inane modification if you are in-system. (If the ship is not equipped with Hyperdrive, you simply tried to abusively accelerate the Sublight Drive, delivering Severe damage to it and two random malfunctions).	Your mind in a haze, you misinterpret the Astrogation plot and shut the ship off in a random direction. Roll on Abund maneuver to drop safely out of hyperspace. For every 10 less than 100% success, the ship receives a Pierce critical strike (random: 'A' to 'E'; severity, 20% chance of each) from space debris. Assuming you survive that, the Astrogator must roll on Abund maneuver to navigate you out of wherever you are.	(100%) You think yourself very clever using a nearby gravity well to slingshot the ship and save energy. Too bad you miscalculated. 50% chance you go too low. Roll on 'E'. Blast critical on the ship as it hits planetary atmosphere, also 3 random malfunctions; 50% chance too high, and hurtle across the system. The Pilot must complete a Very Hard maneuver to stop the ship, and every round he is attempting to do so 1-2 random malfunctions occur due to structural strain.	The Astrogation console bypasses like a Christmas tree, obviously you have done something seriously wrong, and the computer confirms it: the control panel is Severely damaged, and the computer is Moderately so. 25% chance you have destroyed the Astrogation program in the process.	A gut-wrenching metallic shriek accompanies your attempt to maneuver. Whatever maneuvering system you are attempting to use (thrusters, gravitics, N-Space drive, Tons light drive) overloads and is Very Severely damaged and of 90, as is the pilot console. No need to roll the actual maneuver.
(-150) — (-101)	Your badly executed attempt causes the vehicle to veer dangerously 1-10 meters to one side. Roll the default. Good luck.	Oops. You mishandle the controls and the craft hurtles in a random direction (1000 meters if cruising; 50 meters if landing/takeoff) before you get a grip. Hopefully there was nothing in the way...	Your spastic piloting causes the ship to lurch erratically. Everyone on board and not strapped in takes on 'A'. Unbalancing critical. Those who are buckled in take 1-10 hits and must resist vs. nausea. One Routine random malfunction also occurs.	Clumsy execution. You miscalculate the Matter/Annihilator fuel mix and cause Very Severe damage to the Hyper-space drive engine(s). They are inoperative and you are red-faced.	(100%) In a danger-like maneuver you plot a course in a bizarre direction, at the end of which (10 hours later, if no one makes a successful Very Hard Perception to notice your curious route) you are lost in space, despite any Astrogation aides. Complete a Hard maneuver just to figure out where you are.	(100%) You fail to notice a gravity well along your chosen course. So does everyone else. 1-100% of the way along the trip, the ship passes through it, triggering 1-10 random malfunctions. Your course is altered by 10-100° in a random direction. Calculate your new destination. If you do drop out of Hyper here, a new course must be plotted. Very hard, due to the uncertainty of your location.	Sparks fly on the bridge as the already strained control systems give up. Pilot and Astrogation controls are Extremely Severely damaged and useless. Computer Pilot and Astrogation programs burned out (irretrievable). 2 Random Severe malfunctions occur. No progress on your attempted maneuver.
(-100) — (-51)	Cruel abuse of the machine causes Moderate damage to the appropriate system (brakes, steering, tires, hydrofoils, etc.) Move is 50% successful, and systems is at 50 until repaired.	Inevitable handling of the ship triggers 1-4 Routine malfunctions. Roll on appropriate table.	Really weak execution. Sloppy drive engagement overloads the cooling systems. Moderate damage to Sublight Drive (speed cut in half until repaired).	A poorly orchestrated adjustment to the course causes 5 random malfunctions due to stress on the ship before the computer overrides you and drops the ship out of Hyperspace. Novopilot must re-plot a course (Medium maneuver) and you must re-roll to resume your journey.	(100%) In a slovenly attempt to cut corners, you plot a course through a planetary ring/asteroid field. Roll 1-5 "B". Pierce criticals against the ship before the pilot can roll (a Hard maneuver) to get you out. For every round before he is 100% successful, roll another "B". Pierce crit.	(100%) You miscalculate. Fortunately, there is nothing dangerous in the way, nevertheless, you end up at a spot off-course from your intended destination. Plot a new course (Very Hard).	The ship takes a "C" blast critical from strain, and 3 random Severe malfunctions. Attempt to complete your maneuver now at 100.
(-50) — (-26)	Panicked confusion on your part causes you to decelerate to half speed (unless that was the intended move, in which you accelerate to half again faster).	Sloppy execution. If landing or takeoff, you have Moderately damaged the landing gear; if cruising, Routine damage to whatever mechanisms maneuver the craft through air/space (gravitics, attitude jets or aerion surfaces). They are at 20 until repaired.	You fail to compensate for all gravity field effects; you achieve nothing and the course must be re-plotted at. Your next maneuver is two difficulty levels higher.	The computer rejects your attempt to enter/leave Hyperspace as dangerous. It requires 12 rounds (2 turns) to unlock the controls and try again. If attempting to leave, see notes regarding displacement problem.	You develop a splitting headache at just the idea of plotting on interplanetary course. Kettle to your cabin for at least an hour before trying again.	Apparently you need the star-map wrong; you spend 10 turns carefully plotting the course only to discover that you have done it all wrong. Try again at 20 (you're discouraged). Hope you're not in a big hurry.	The main reactor/energizer malfunctions under the strain (if it hasn't already); the problem is Severe. Either shut it down now (aborting the maneuver attempt) or proceed with a 100 modifier. If you press on, it will function for 1 hour, then fail completely. Extremely Severely Damaged.
(-25) — 0	You have a lapse and fail to attempt the maneuver, instead continuing as you were.	You mind on other things; you fail to even attempt the maneuver. (0% movement)	You fail to take any action (0% movement)	For reasons unclear even to you, you decide not to attempt to enter/leave Hyper this turn. If attempting to leave, see notes for displacement.	You stare blankly at the luminous plate/sensor, watching the pretty patterns while you accomplish nothing for 6 full rounds.	(100%) Well, you lay in the course and take only a minute to do it, but the plotted route takes twice the time it normally would. Too bad, nobody figures this out until far too late. Have a nice trip.	You are forced to override the control system safety features. Roll maneuver at 50. Less than 100% successful; the system shorts out before you complete the maneuver: control system and console are Very Severely damaged. You take a "B" electrocution critical.
01 — 10	10% Slowly but surely.	10%	10% Snails move faster.	10% A slow start.	10% So Rome wasn't built in a day.	10% You'll get it done eventually.	Amidst 5 random malfunctions, attempt your maneuver at 70.
11 — 20	30%	30%	30%	30%	30%	30%	The ship shudders ominously, and suffers 2 Moderate random malfunctions. Maneuver at 50.
21 — 30	50%	50%	50%	50%	50%	50% It might go quicker if you didn't spend so much time playing "Space Commander" with the console.	Structural strain causes hull breaches in one crew cabin, one gun mount and the sublight engine room. Bulkhead panels seal; implement appropriate Vacuum crisis to affected personnel. Roll maneuver at 50.

8.0 GLOSSARY

AFV: (Armored Fighting Vehicle) A machine whose mode of travel is primarily overland, and is designed for combat or combat-support functions. Always armored; usually armed with mounted weapons.

Alterant Replicant: A living being created from genetic material altered on the chromosomal level. Usually an improvement over the natural model.

Android: A robot designed to resemble a human or similar race to all appearances. The most sophisticated Androids are equipped with self-programming Molecutronic brains and very sophisticated internal systems to mimic human functions.

AR: (Acceleration Rating) The rate of change of speed a given ship is capable of.

Automatic: Refers to any weapon which is capable of rapid-fire bursts of ammunition.

CAT: (Construction Armor Type) This refers to the ten **Space Master** Armor Types created for vehicles and ships which have armor far superior to anything conceptualized in **Rolemaster**. Construction Armor Types are numbered 21-30, not necessarily implying a direct progression, but to indicate a superiority to the RM Armor Types 1-20.

CPU: (Central Processing Unit) The main processor of a computer. In **Space Master** the Mk. number of a computer is equal to its processing unit capacity. Since most programs require more than one Processing Unit each, probably substantially fewer programs than units can be run simultaneously.

Cumet: Cubic meter.

DB: (Defensive Bonus) The total of a number of modifiers which affect how difficult it is to "hit" an opponent.

ER: (Energy Rating) A term to designate the power requirement (or output) of a given facility.

Elmonit: (Electronic Monit) The standard unit of currency throughout the Imperium.

Energy weapon: Any distance weapon which projects an energy beam/burst as opposed to a physical projectile or missile weapon.

EW: (Electronic Warfare) Also known as Stealth or Cloaking systems, EW is a multifaceted technology designed to render vehicles invisible to Sensor and visual scans. See section 6.13 for details.

Fire: Any distance weapon attack, this term corresponds to the "missile" concept in **Rolemaster**, but is broadened to encompass projectile and energy weaponry.

FR Picks: (Function Rating Picks): These are acquired with Function Rating Points. Most Picks cost more than one Point each. Sometimes referred to as Function Rating "levels".

FR Points: (Function rating Points): Purchased at a given monetary value, these points may be expended to buy Function Rating Picks (above) and thus provide different functions for a given vehicle/robot.

FTL displacement: Faster Than Light displacement — the distance a starship travels through Hyperspace in a given period of time.

Function: The mechanical equivalent of a character development 'Skill'.

GCV: (Ground Conveyance Vehicle) A machine which requires a solid surface on or above which to operate, whether it be wheeled, tracked, gravitic, etc.

Gravitics: The technology of annulling, countering or creating artificial gravity. Gravitics has a variety of uses, from internal Starship stability maintenance to high-speed planetary flight.

Gravity Well: A term used to describe a specific radius about a large celestial body where it is dangerous to engage in a *Hypershunt*. The standard radius given is 500 x the diameter of the body itself.

Hoofies: The little cloven things at the end of the legs of sheep.

HUD: (Heads Up Display) Applicable to gunner bonuses, a HUD is a small visual readout screen or other display which shows targeting data and other relevant information to the gunner. HUD's have differing bonuses based on their quality and sophistication.

Hypershunt: A term describing the actual transfer of a vehicle into Hyperspace. All travel in Hyperspace is measured via FTL displacement rather than 'velocity'. It is referred to as a 'shunt' because of the high-acceleration boost necessary for feasible FTL travel.

M/A: Matter/Antimatter — relating to a power source derived from the mutual annihilation of certain particles of matter and antimatter.

Mark (Mk.): A numeric designation to indicate the power of a given weapon or system. There is not necessarily any interrelationship between systems unless specifically indicated.

Melee: Hand-to-hand combat (as opposed to 'fire' combat) where opponents are physically engaged — be it a fistfight, a duel with rapiers, or a wrestling match. All of these are considered melee.

Missile weapon: In **Space Master** this indicates a weapon which manually fires an airborne projectile, such as an arrow from a bow or a quarrel from a crossbow. This does not include projectiles fired by explosions or other high-velocity propulsion means. Thrown weapons are also included in this area.

Molecutronic: The ultimate electronics technology, molecutronics stores data in a method similar to that of the human brain, but much more efficiently.

N-Space: Normal Space — as opposed to the interdimensional realm of Hyperspace.

OB: (Offensive Bonus) The total of a number of modifiers which affect an attacker's chances of hitting an opponent with a weapon.

Projectile weapon: As opposed to a *missile* weapon, this indicates a device which mechanically fires a high-velocity projectile.

Psion: Referring to Telepathic/Psionic power; the act of using such power. This corresponds to the **Rolemaster** term "Spell" which refers to the use of a magical ability.

Rating Pick: Gradients of power / speed / protection / sophistication of certain systems. The concept is based on discreet units of differing value, similar to the **Rolemaster** skill development system. Unless otherwise noted, the first ten Rating Picks provide a +5 bonus per pick, while the next ten give a +2 bonus per pick, picks 21-30 are worth 1 point each, and all others afterward are worth 1/2 point per pick. See specific references in the rules for individual exceptions.

Replicant: See *Alterant Replicant*.

Robot: Any self-motive powered machine with manipulative limbs.

RIF: (Relative Inertial Field) Necessary for hyperspace travel, it suspends certain relativistic and inertial physical properties.

Sensor: From the acronym: SENSr (Selected Electromagnetic/Neutrino-Stream Reflection). This refers to a system using selectively treated, hyperlight-accelerated neutrino (and photino) beams. They are completely harmless and almost undetectable. Range varies, but there is distortion beyond about 50 light-years.

Skill: Refers to a bonus acquired by a character through practice and aptitude. Whenever a specific skill is mentioned, it refers to one found in **Future Law**. If **Future Law** is not used, the GM should extrapolate to his own system or make an appropriate equivalent.

SMAC Fighter: (Singly Manned Attack Conveyance) Fighters are a classification of small, highly maneuverable ships with a single pilot/gunner designed primarily to assault other space vehicles. Some are capable of in-atmosphere flight (and so attack planetary defenses) and landing. Most are short-range, possessing no hyperspace travel capability, and have only a small cockpit with limited pilot mobility potential. The emphasis is on sublight speed and maneuverability, and high-output weaponry.

Standard Day: The standard galactic day in **Space Master** is 25 hours long — the time found to be most natural for human circadian rhythms. Hours and minutes remain intact from Old Terra timekeeping.

Stealth: See EW.

Tachion Beam Dictor: Communications system utilizing tachion beams (more stable over a long range than neutrinos) to transmit information. Effective range is about 30 light-years without relay. See sec 2.0.

9.0 APPENDIX

The following formulae were used to arrive at the turn/velocity ratios in the Starship Turn Table. Anyone wishing to use the actual formulas are welcome.

For angles greater than 90°:

$$V \cos (x) \pm \sqrt{A^2 - V^2 \sin^2 (x)}$$

For angles 61° to 90°:

$$.866V \pm \sqrt{A^2 - .25V^2}$$

For angles 31° to 60°:

$$.5V \pm \sqrt{A^2 - .75V^2}$$

For angles to 30°:

$$0V \pm \sqrt{A^2 - V^2}$$

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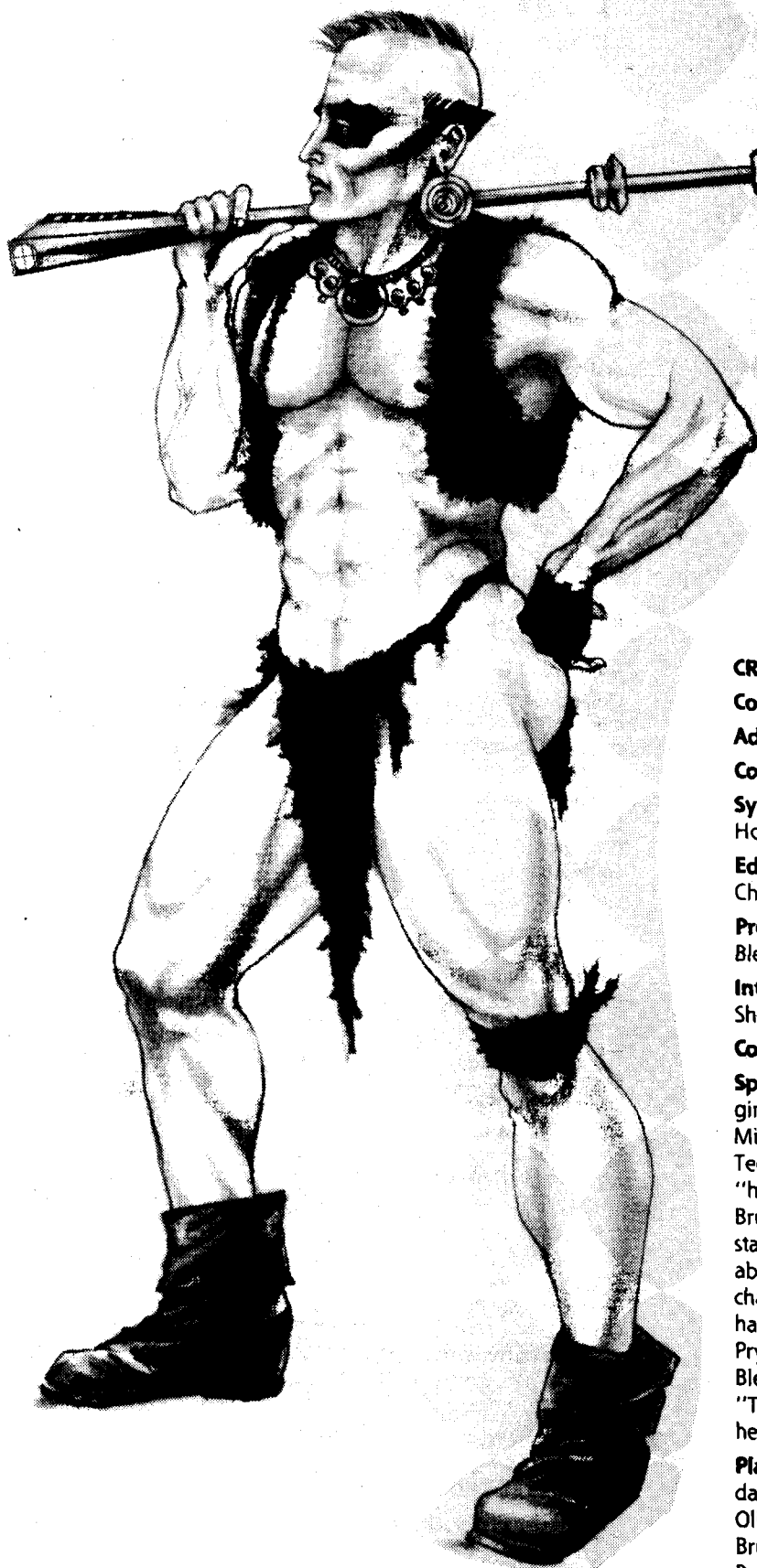
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ALTERANT REPLICANT: WARRIOR

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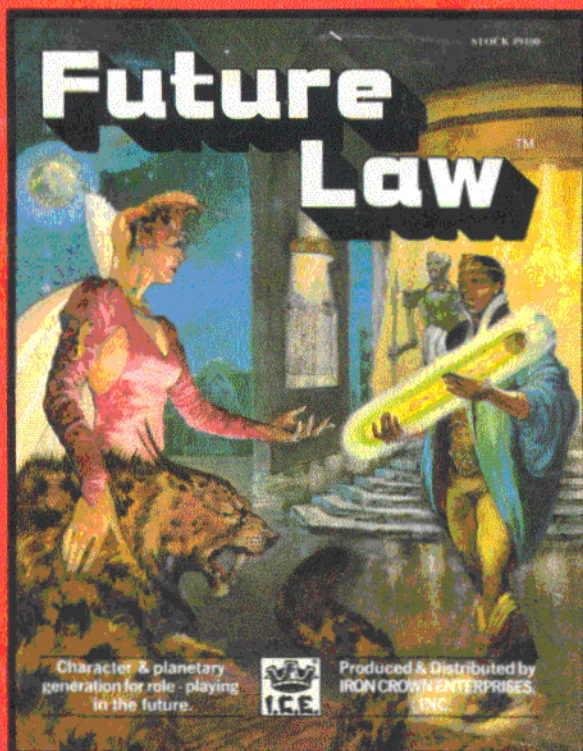


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