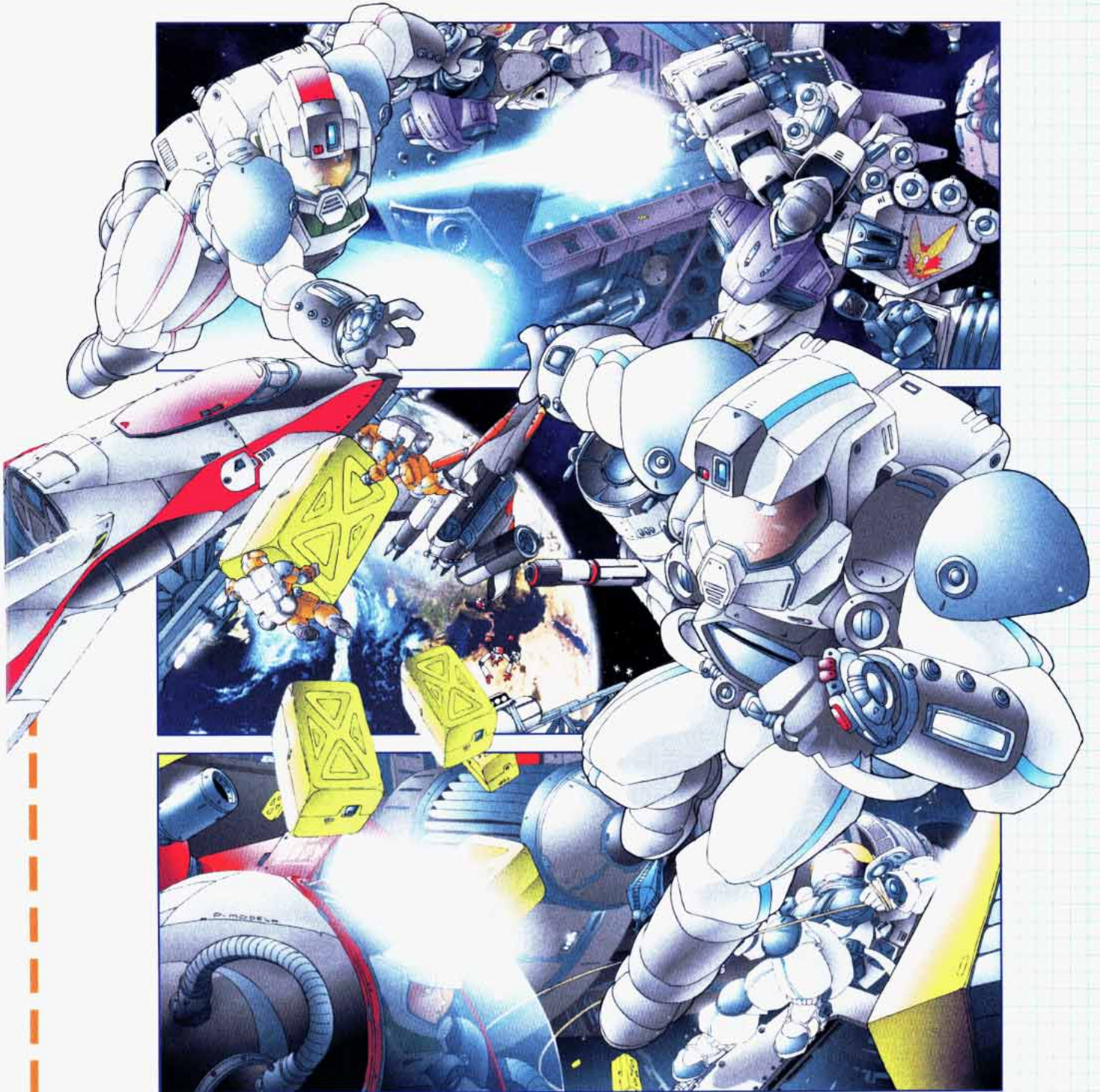




JOVIAN

ADVANCED RULES & BACKGROUND



FROM DREAM POD 9

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JOVIAN

CHRONICLES

Guilt washed over Viviane at the sight of her inadvertent handiwork. From the vantage point of her Pathfinder, she gazed at the highly radioactive Corridor of Death between Io and Jupiter, then at the SS Bacchus, drifting away with its engines shut and a gaping hole in its cargo bay. One stray missile...

In her comm, Captain Murdock was barking orders repeatedly over the blaring ship alarms. "Panther One! I repeat, get out of the interference zone and call for help! There's no time to lose!"

But Viviane knew there just wasn't enough time. It was her fault, all her fault, and she had to do something. She turned off her comm system and flew rapidly toward the Bacchus, slowing down near the prow to make her Pathfinder lean against it. She threw an override switch, and almost immediately the throbbing of her engines went from a low rumble to an excited pitch. The resulting thrust pushed the exo's structure tight against the hull of the wounded trader. Armored fingers dug into the plating of the ship as she struggled to maintain her grip. Inside, Viviane could hear her Pathfinder protests as the ferocious thrust strained the exo's joints and overheated its fusion core. She knew it couldn't take this for very long. She just needed it to hold on long enough to push the merchant ship away from the Corridor.

It was an act of desperation. It had to work...

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***JOVIAN**
CHRONICLES



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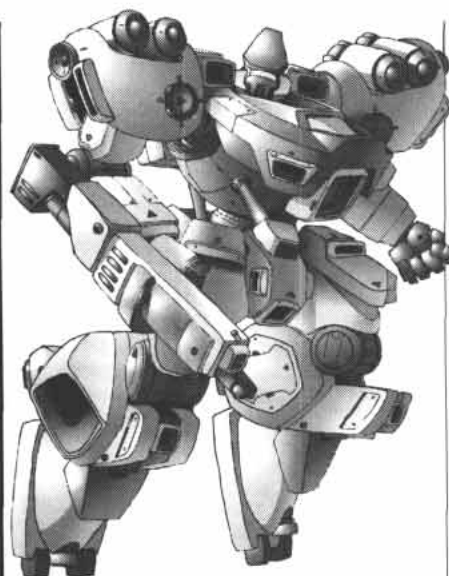
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INTRODUCTION

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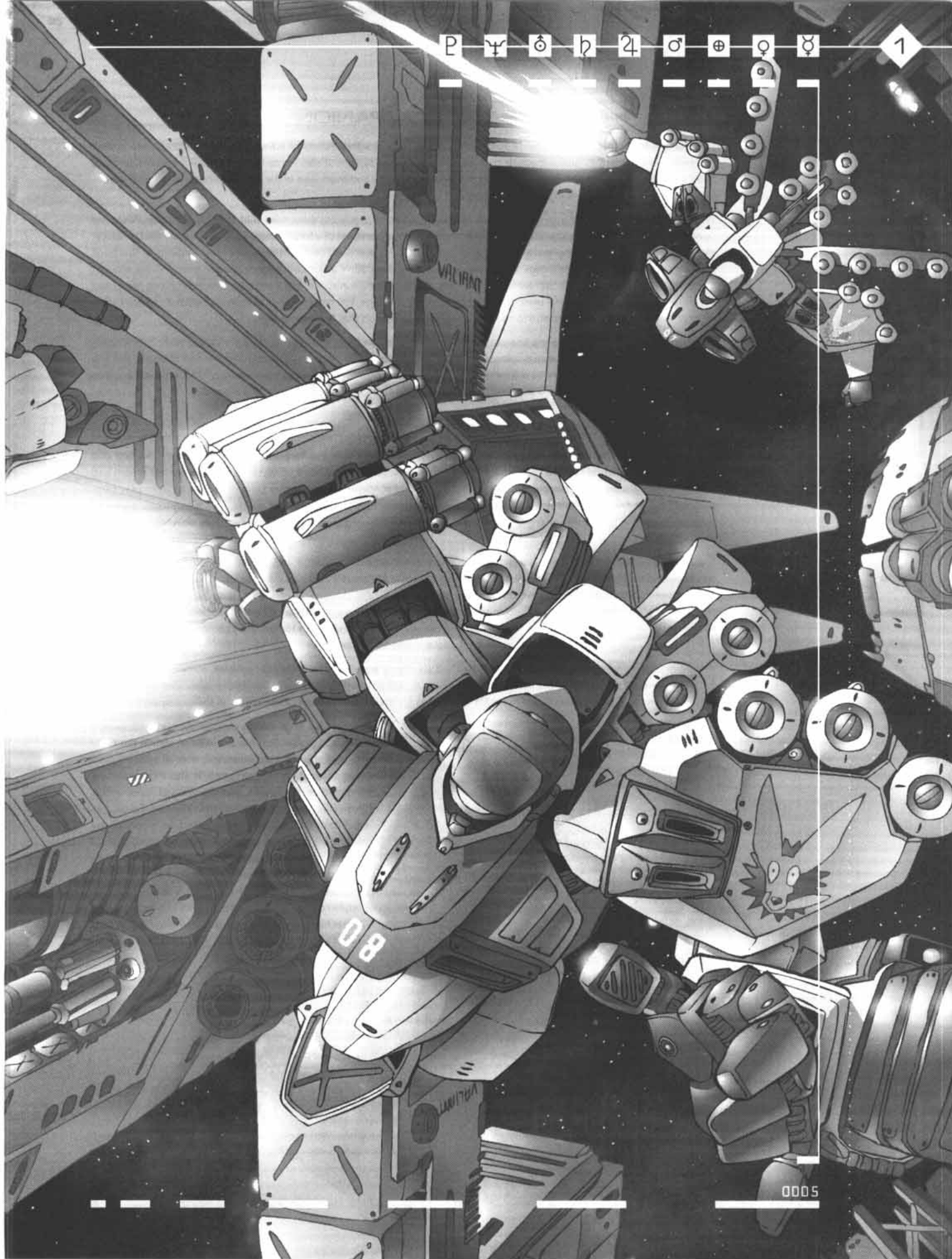
► LIFE IN 2210...

Welcome back to the world of the Jovian Chronicles!

The **Jovian Chronicles Companion** is a supplement for the science fiction game universe of the same name. As its name implies, the book is a companion volume to the main rulebook, offering additional insights and ideas on subjects that could not always be fully covered due to a lack of space. The solar system of the twenty-third century is vast and complex after all, and it is hard to provide much more than glimpses of it through these few pages.

The **Companion** contains advanced rules and specific cases for those who want to take their **Jovian Chronicles** characters and campaigns a step further. It also features additional background information, much of it visual in nature, and the long-awaited, complete Silhouette vehicle and weapon design systems. Design, not construction, because statistics are chosen and not decided by a set of formulas that may or may not match the concept you have in mind. There is no such restriction in these rules, allowing both Gamemasters and Players to field the vehicles they need for the story and not just close approximations. The design rules also handle only the "nuts and bolts" game part, leaving you free to describe your new creation in as much detail as you like.

Most of the material found in this volume will only apply in certain situations. For example, it would be excessive to constantly calculate the effects of gravity or radiation on the characters, and it is quite unlikely that new vehicles will show up every hour of the game. Any and all of the advanced rules can be safely ignored by the Gamemaster should the group prefer it.



HOOKS AND TIPS ◀

While the **Mechanical Catalog** provides Gamemasters and Players with a variety of new options for their campaign, it is important that the focus of a roleplaying game remain on the characters involved in the game.

This book offers lots of new ideas and rules. It may be tempting to use them all, but this is likely to slow the pace of the game to a crawl. It is better for Gamemasters to keep them for special occasions when such unusual conditions will further the plot. For example, the detailed atmosphere rules shouldn't be used in normal combat, but would sure come in handy for that "marooned in space" scenario. Idem for the radiation rules: any astronomy student will tell you that living in the violent radiation storms that extend throughout the Jovian regions of space is a bad idea, yet we ignore these concerns for the sake of the overall story. The Gamemaster should use only what he needs, and discard the rest. The story is what is important here — the rules and technology should just support it, and not the other way around.

THE VEHICLE CONSTRUCTION SYSTEM ▼

The construction system herein allows many possibilities for the Gamemaster. Since the system has no built-in limits, the Gamemaster (or even the Players) can come up with exactly the vehicle or ship needed for a specific scenario. Unfortunately, that freedom is a double-edged sword: it is easy to go overboard and create mechanical monsters that completely unbalance the game. It is also easy to become obsessed with the numbers themselves, either seeking to produce the "perfect unit" (point-wise) or, perhaps more troubling, to over-engineer the details of a given design, down to the kilowatt required for the reading lamps or the last kilogram of reaction mass.

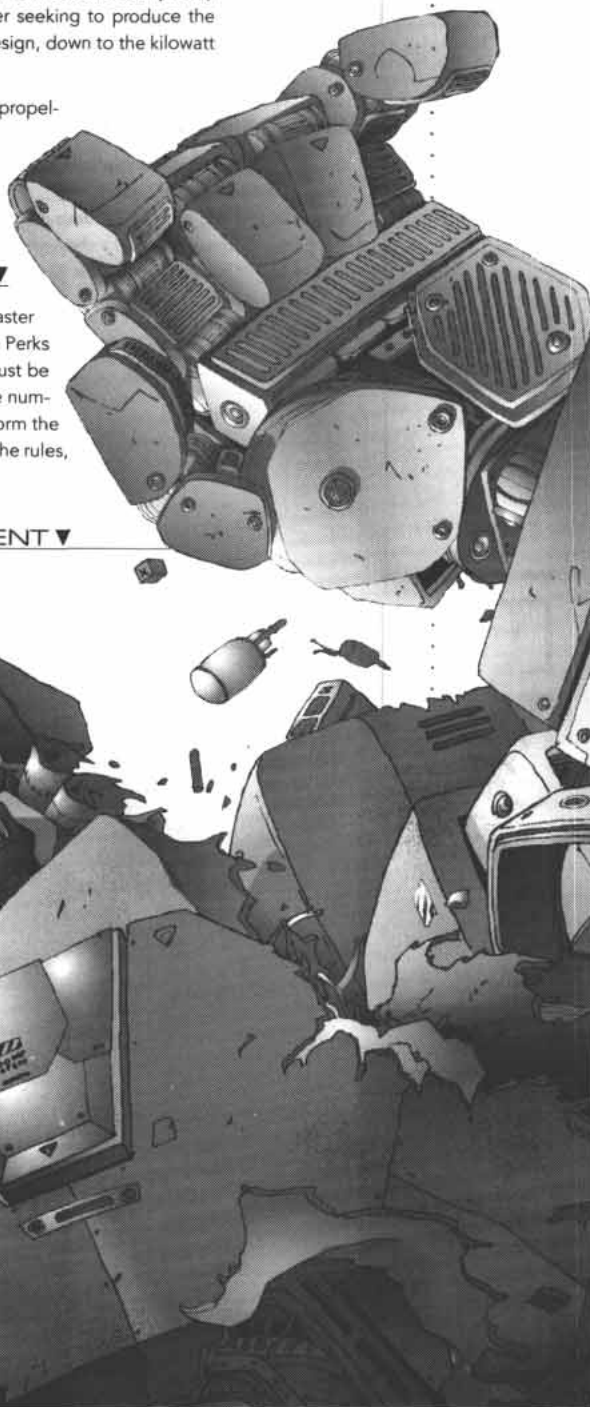
For those who wish to play a "hard science" SF campaign, the tonnage listings of structure and propellants can be readily number-crunched. In the interest of simplicity and speed of play, however, most of the stats and rules have been allowed a considerably large margin of error. For anyone who wishes a completely realistic simulation, the stats provided should be used as guidelines which the accuracy-concerned Gamemaster can flesh out as needed.

THE WEAPON CONSTRUCTION SYSTEM ▼

Yet another powerful tool, the Offensive and Defensive System Design rules will allow the Gamemaster to create any type of weapon or special system required by a given design. Combined with the Perks and Flaws, this offers almost limitless possibilities. Again, a disclaimer and a word of caution must be offered. No point system can accurately represent the capabilities of a given weapon in a single number, and attentive players will no doubt soon find combinations of characteristics that can transform the smallest revolver into a pint-sized tank gun. It is important here to play according to the spirit of the rules, not the letter. The world and the story impose the limitations, not the rules.

CONSTRUCTION SYSTEMS FOR PLOT DEVELOPMENT ▼

The Gamemaster may choose to limit the number of new designs in his campaign, and has every right to do so — the astronomically high costs associated with developing a ship or exo design keep this pastime the purview of the various nations and a few, very, very wealthy corporations. The Players are entirely likely to be too busy piloting or riding one of these to put in the time required to design one. The most they are likely to be able to come up with are a few scratch-built vehicles under desperate conditions (and all the lemon rolls attendant with such a design).



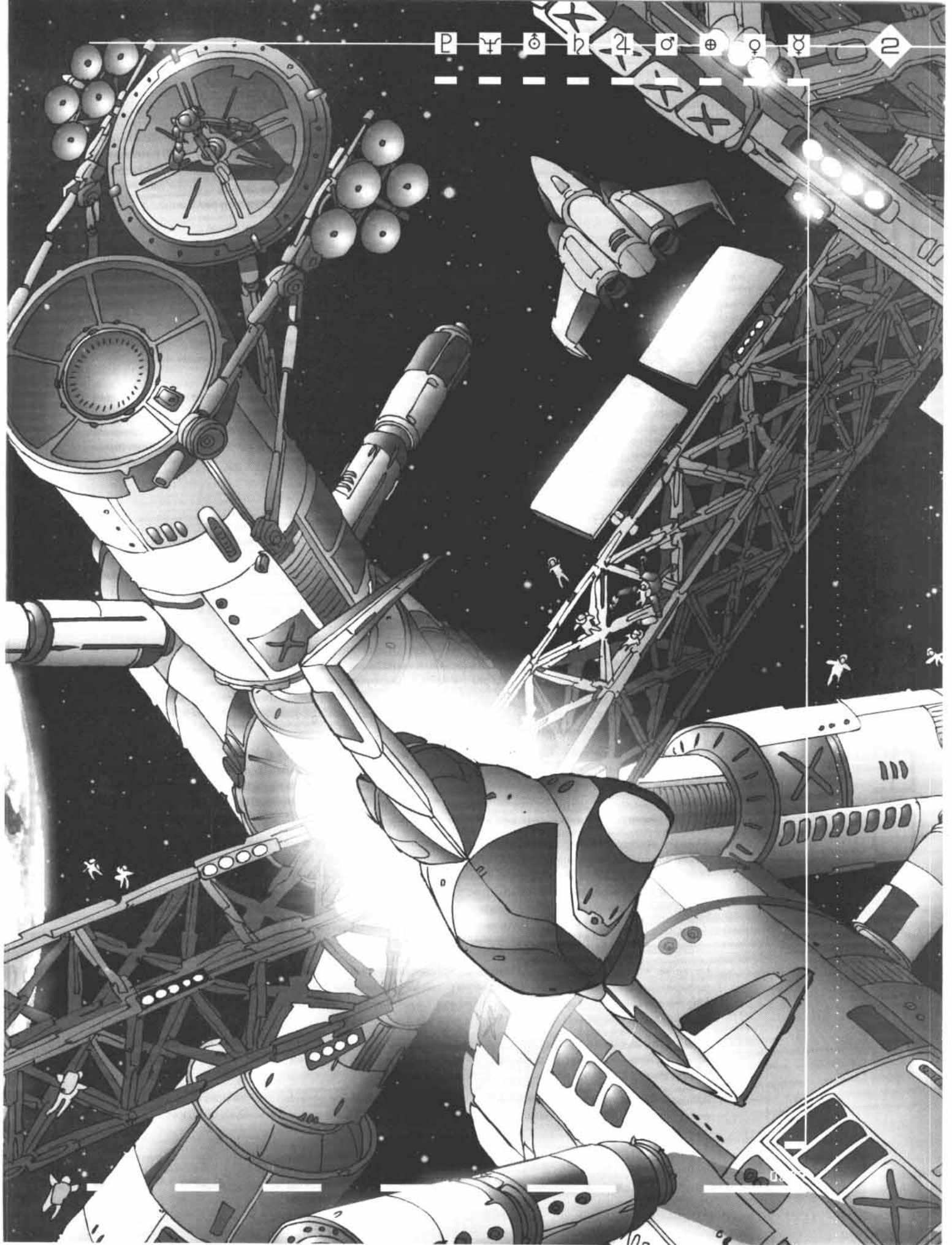
► HISTORY OF SPACE

Mankind is a species of remarkable persistence and boundless curiosity. In the space of only a few short centuries, it has made the leap from an agrarian society bathed in mysticism to a multi-planetary community supported by the rules of science. The "growth spurt" that dispersed humanity in the solar system appears to have slowed again recently, perhaps to give humanity time to settle into its new environment. Indeed, the next logical step, moving to the far-away stars themselves, is such an incredible leap into the unknown that it may not occur for centuries to come.

Just like the previous times of human history, the conquest of space, and the centuries of discovery it represents, was rich in intrigue, conflicts and discoveries. The development of a space-based society occurred years ahead of even the most optimistic schedule, and it is likely that Mankind would not be a third as advanced had massive amount of money not been poured in the conquest of space from the start. In retrospect, this is most fortunate: without its offworld colonies, it is likely that human civilization would have emerged from the Fall only to enter a new dark age.

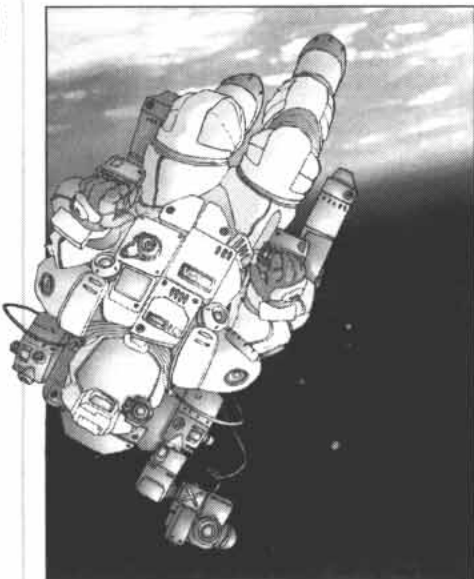
Examining the details of the past helps to understand the state of affairs in the present-day solar system. Our story begins at the end of the twentieth century, when one small company's discovery started a chain of events that few would have thought possible only a few years before...





2.1

► THE NEW FRONTIER



The second half of the twentieth century was rich in scientific improvements and social revolutions. For the first time in recorded history, Mankind set foot into space. This began with tiny, hesitant steps, which then grew more confident. By the end of the century, low orbit was filled with satellites of all kinds and primitive space stations had been put into space.

In 1977, Gerard K. O'Neill proposed a new design of giant space station that could become a home away from Earth to many thousands of people. Similar designs were later proposed, some of them dispensing with the large "windows" of the O'Neill concept. The open-type space colony, soon named the O'Neill Cylinder because of its shape and designer, lingered in the files of NASA and other space agencies for nearly a complete century as society and technology struggled to catch up with the idea. During that time, space colonies mostly existed through the many science fiction shows and games of the era and in the imaginations of countless dreamers.

In 1982, the first launch of a mostly reusable space shuttle by the United States of America heralded the days when space would be easily accessible to private and national concerns. Even though the shuttle program suffered some terrible setbacks, it opened the way to the TAVs (trans-atmospheric vehicles) and SSTO (Single Stage To Orbit) vehicles of the early 21st century.

▼ THE QUEST FOR ENERGY

2.1.1

Pollution became an endemic problem in the closing years of the 20th century, with entire regions condemned because of industrial accidents. Less polluting alternatives in the fields of power generation and heavy manufacturing were needed to reduce the strain on the environment. In August 1997, a small Japanese corporation, Ohita Electronics, released a second generation solar cell which had ten times the efficiency of any previous design. A mere six months later, NASA officials were proposing the Solar Power Satellite project to Congress, and a test program was approved with political and financial backing to hurry it along.

In December 1999, the Space Shuttle *Endeavor* placed the first experimental Solar Power Satellite, XSPS 1, in orbit. Early tests were successful, and the SPS project was approved: it would be implemented over the next twenty years. The need for a permanent, self-sufficient space station for the maintenance and construction of the solar arrays soon became apparent — more urgent than originally thought by those who had masterminded the project. Three years later, after considerable lobbying, Prometheus Station Module 1 was launched atop an *Energy*-class booster bought, despite much protest from Congress and from the cash-strapped Russians.

By 2004, the SPS project was in trouble. SPSes 1 through 3 were operational, but only at 30% of their nominal power. Cost overruns threatened to cancel the entire program, whose problems were compounded by rumors of corruption and back-room deals. The high cost of sending materials and elements up into space proved a heavy burden because of inadequate, government-funded programs. The new benefits from the conquest of space, however, could not be ignored and accelerated the pace toward the next logical step: talks about a lunar base and massdriver began later that year.

While the various governments talked of the glorious age that mankind would enter when they perfected space travel, private companies quietly started developing space vehicles of their own. Nearly all of these commercial transorbital vehicles were designed to be reusable and their efforts would bear fruit in the first decades of the twenty-first century. In the meantime, other corporations had manufactured their own SPS elements. Early successes in both of these fields proved that private interests would take Mankind into space, not governments.

◇ ARTIFICIAL SUNS

November 9th, 2007 will remain one of the most important dates in human history. On that day, a prototype fusion engine managed to sustain a fusion reaction and generate power for six hours. The breakthrough in the field of nuclear fusion came from the combined efforts of teams from Stanford and Tokyo Universities, along with exiled researchers from the cancelled Canadian fusion program.

Their reactor was based on muon-catalyzed fusion, developed from a line of research first explored by Luis Alvarez and Andrei Sakharov. Subatomic particles are used as a catalyst, bringing atoms much closer together and allowing fusion without the need for bulky, power-consuming containment units.

Although the new fusion reactor was fragile and temperamental, it would be perfected over the years to become one of the principal sources of energy production on Earth. Smaller designs would also be used extensively on spaceships.

CHARIOTS OF FIRE ▼

The main stumbling block of the space project remained the inefficiency of the chemical engines used for spacecraft. The next generation of liquid fuel engines, part of the program started for the original Space Shuttle, was released by 2007. The trial flight of the *Megaloader*, the first true space cargo vehicle, took place only four years later.

Unlike most large space programs of the past, the *Megaloader*-class vehicles were developed by a consortium of private enterprises who steadfastly refused any help from the government. The new launchers could easily hoist nearly 20 tons (and later, up to 40) of payload into low Earth orbit and then return, landing near their launching point to be refueled, serviced and completely reused within a few days. The success of the project started several research programs in many of the industrialized nations, and similar cargo ships would be used routinely over the next forty years to deliver ever increasing amounts of material and people into low Earth orbit.

The next development in space technology was to come from an unlikely source. An efficient high energy laser was perfected by students at the MIT and presented in March 2015 for their end of semester project. A mere month later, all six Project: Photon students were hired by NASA and given a lavish research budget. The first Laser Launch System (LLS) prototype was constructed at Cape Canaveral two years later. Unfortunately, the first test flight — on September 17th, 2017 — was a complete failure. The test rocket was disintegrated by the LLS as it rose from the pad. Despite this early setback, LLS research continued over several years, and the technology was eventually made practical enough to be mounted on many lunar and orbital launch facilities.

2-1-2

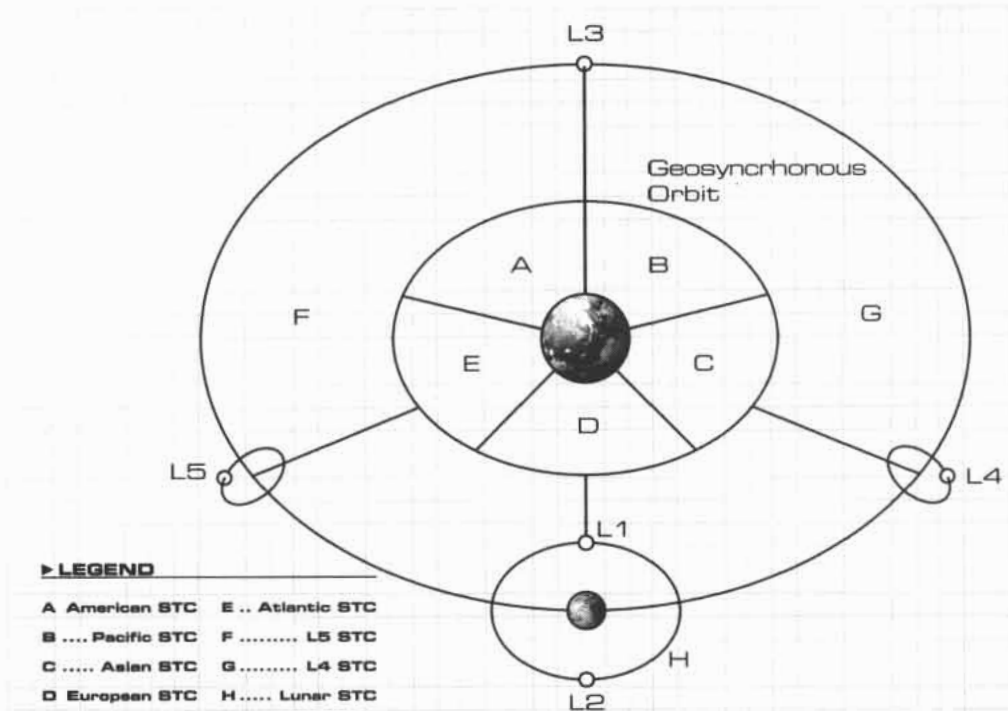
SPACE TRAFFIC CONTROL ★

The development of reliable and privately operated launch vehicles led to a rapid increase in orbital traffic during the first decades of the twenty-first century. By 2020, it became evident that some kind of multi-national traffic control service would have to be implemented lest accidents and potentially catastrophic mishaps occur on a routine basis.

This led to the formation in 2022 of the International Space Traffic Control Office. The ISTCO was first composed of five large control centers, one for each STC orbital zone (see diagram). All spacecraft first registered a flight plan with their local ISTCO representative. As they flew off from the launching pad they were considered to be under the jurisdiction of whatever source governed the local airspace. In order to facilitate the transition to space, each craft was taken as a charge by the local STC center as soon as they reached an altitude of 100 kilometers. As each spaceship moved in and out of orbital zones, computers and other automated devices ensured that they were taken in charge by the next zone. By the twenty-third century, similar systems were in place over all inhabited worlds.

HISTORICAL FACTS

SPACE TRAFFIC CONTROL DIAGRAM ▲



SCIENTIFIC FACTS

▶ THE COLONIZATION AGE

The construction of the skyhooks raised the enthusiasm of the general public. New projects were proposed almost daily by government agencies and private concerns, all anxious to use this new low-cost launching alternative. The need for cheap construction material remained, however, and so in January 2024 the first permanent lunar base was established. Moon Base Alpha was made up of two domes and one landing pad, and was crewed by a multinational team. Construction began on the massdriver hangar while the delicate electronics were being assembled on Earth.

▼ MARS DIRECT

The new wave of interest in the conquest of space brought back the half-forgotten project of the exploration and possible colonization of Mars. In particular, the existing space facilities made it easy to launch a single stage Earth to Mars mission. Each Mars Direct mission was composed of paired spaceships, one manned and one unmanned. The unmanned spaceship contained the return vehicle and a miniaturized refinery capable of extracting the required fuel from the Martian atmosphere. The manned mission was launched only when it was determined that the return vehicle was fueled and ready.

Using the experience gained from the lunar base (the vehicles used were very similar to those of Mars Direct), the first mission to Mars left in early 2027. The return vehicle was already in place, having softlanded two years earlier on a base prepared by robotic probes in the early '20s. By the time the first crew left, four other Mars Direct spacecraft were underway, ready to spearhead the construction of the first permanent human city on Mars.

▼ HIGHWAY INTO SPACE

Although the development of efficient launch systems significantly reduced the cost of putting material in orbit, the cost per kilogram was still considered too high. The orbital elevator concept was one of the early options studied as a possible means of reducing launch costs.

An orbital elevator consists of a space station placed in a geostationary orbit. The station simultaneously extends tethers down toward the Earth and in the opposite direction, thus keeping its center of mass (and orbit) constant. The lower cable is anchored to the ground and elevator cabs are used to transfer material up into space. The outer tether also allows payloads to be released with greater than orbital velocity, launching them into space at no fuel cost.

Preliminary studies soon showed that such a device would be near impossible to build. Each segment of the tether must not only hold the payload but also the weight of each segment under it. The tether must thus get thicker and thicker, and huge taper ratios were calculated. It was proposed that the space station's orbit be lowered and the tether stopped just above the tangible atmosphere, reducing the system's overall length. This made the construction of the skyhook (as the new system was called) possible with present-day technology. Although the base of the tether would be traveling at hypersonic velocity relative to the ground, specialized shuttles could already be built to reach it.

From 2020 and later, nations were putting up forests of skyhooks in orbit, enabling more and more cargo to be lifted at very little cost. Some were put to work in large “teams,” their combined capacity allowing extremely large or heavy payloads to be slowly lifted into orbit—the only limit being the size of the cargo bay of the hypersonic shuttle, and even this caused less problems once the fuselage-mounted cargo pods were put in service. SSTO vehicles took up the job of taking people and priority cargo up.

Mankind had just built its first highway to the stars.

◆ NEW TECH

Exatech Chemicals introduced the first mass-produced artificial diamond fiber composites in September 2026. They were produced under zero-gravity conditions aboard Exatech's ground-breaking automated space factory, a comparatively small construct orbiting a few hundred kilometers above the ground.

Although costly, the new fibers were much less expensive than diamonds hauled up from the surface of the planet and these new composites were perfect for high stress applications. These fibres could easily be formed into cables, sheets and panels of extreme solidity and low weight. New skyhook designs built using these composites nearly tripled the lift capacity of previous models.

In November 2027, Yokohama-Grubb, a multinational company specialized in pharmaceuticals, announced the first successful human cloning experiment. The baby was an offshoot of the company's organ-regeneration researchs, and although its birth was not planned (or approved) by the board there was little they could have done once it was born. Public outcry and indignation almost ruined the company, which immediatly fired its entire bio-research division. Adam, as the baby was called, was placed in a research institute.

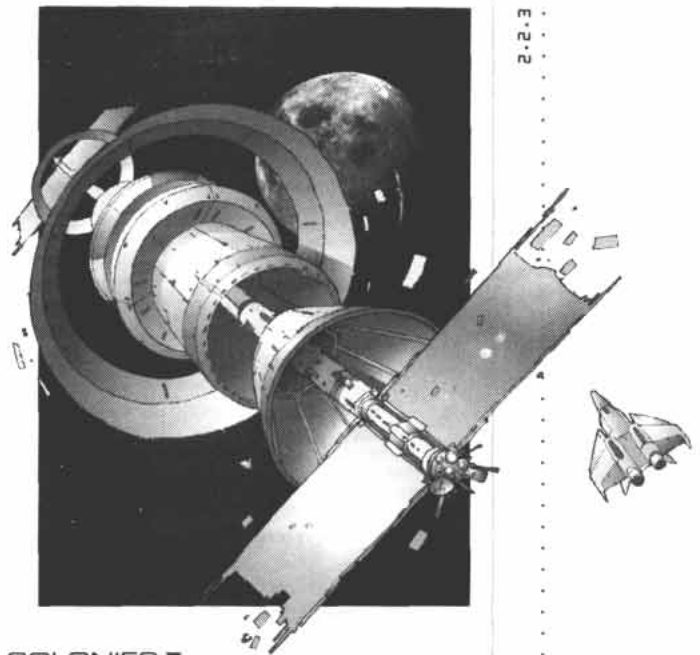
As he grew up, the child turned into a strong, healthy and intelligent boy. He was plagued by self-doubts, however, and underwent psychiatric therapy several times. On his fifteenth birthday, Adam, the first cloned human, committed suicide.

ISLANDS IN THE SKY ▼

The increased level of prosperity on Earth helped slow down the rate of growth somewhat, as families in the developed countries required fewer children to ensure their future. The overall human population, however, continued to grow at a quasi-exponential rate in poorer regions of the globe. New lands were cleared, rain forests destroyed, soils exhausted by repeated farming with inadequate methods.

The Alpha Base massdriver became operational on August 28th, 2028. The first test sled reached the L-2 point without any problem. There, automated "masscatchers" intercepted and stockpiled the ore packets for later delivery to the construction site. The excellent performances of the lunar massdriver showed that sending large quantities of material to the Lagrange points (or any of the complex, inner Earth orbits) was fairly cheap, and the first permanent orbital settlement projects were seriously proposed. These settlements would house the construction crews required to build the massive second generation SPS arrays and orbital factories, and could perhaps be used one day to absorb at least part of the population growth.

After much debate and inflamed discussions, the space island project was approved by the American Congress, the European Council and the Russian Space Agency. In November 2030, the construction site of Island One at L-5 was formally declared open after a four-hour ceremony on Earth.



2.2.3

THE SOLAR COLONIES ▼

As the human population in orbit increased, the people of the Earth sphere started looking toward the future. The skyhooks allowed probes to be cheaply launched to the most distant planets of the Solar System with relative ease, and for the better part of the '20s each planet was radar-mapped and examined by numerous probes and robots.

On July 1st, 2031, the NASA/ESA exploration ship *Galileo II* was launched. The ship carried both solar arrays and an onboard fusion reactor to power its kilometer-long massdriver. Jettisoning fine rock particles at very high speed to produce thrust, the ship set out on the first leg of its journey to the outer system. On March 14th, 2032, *Galileo II* arrived in the Jovian system. Robot probes were immediately dispatched to recover the asteroid dust packages left by previous automated missions, refueling the ship for the voyage home. The ship remained in the Jovian system for nearly six months, conducting experiments on gas mining and performing astronomic studies.

Burroughs City, the first permanent Martian settlement, was officially founded in 2033. At the time, the town was little more than a collection of landing modules left by previous missions and housed a mere 85 people.

In 2034, a small mining/scientific mission was sent to Mercury. Funded solely through private efforts, a base was established and soon its massdrivers started throwing rocks at Venus. The explanation: these were solar sail test shots, using mining rejects, and were sent to Venus so as not to fill the space lanes. The scientific community remained divided: accusations of interplanetary vandalism were raised, but many were eager to observe the results of the operation.

Based on the findings of the *Galileo II* mission, the Jovian Gas Mining Corporation was founded in February 2037. A year later, Ironwheel Station was built in Jovian orbit to house the gas miners. It was the first permanent human habitat around Jupiter, and the one most distant from the Sun. The station was completed in a remarkably short time, and by 2040 housed nearly 1000 people, many of them scientists. The formation of the JGMC heralded the age of the space companies, corporations formed to exploit the riches of the Solar System.

2.2.4

THE SPS3 AFFAIR ★

The rescue of the SPS3 hostages in 2032 remains in the annals of history as the first use of exo-suits in a tactical space combat. Religious extremists had taken over the SPS3 powersat and were threatening to use it as a weapon of terror should the world refuse to convert. The crew had managed to take refuge in one of the modules, where they awaited rescue.

Although the power beam made a poor weapon, it was sufficient to severely damage a ship. The rescue thus came as a squad of USASF exo-suits, stealthily closing in. They first disabled the emitter array, then set to work on flooding the command module with sleeping gas to flush out the terrorists. The latter, however, had outside help in the form of two stolen OTVs, each equipped with a chemical corn laser. Before long, the battle raged around the satellite, as each side tried to place itself on a vector that would allow its weapons to lock on the enemy. The two OTVs were eventually disabled, and all terrorists were later found dead from poison tablets.

HISTORICAL FACTS

▼ A POPULATION EXPLOSION

By the end of the first half of the twenty-first century, the total human population, on Earth and elsewhere, reached nearly 13 billion individuals. The first three Island One stations were completed, each fully inhabited by nearly 140,000 people. The increasing automation of the process and the improved launching capability of the lunar base (now with three massdrivers) made the construction of a new station a matter of one or two years, prompting a migration to space. Proposal for larger Island Two type stations, with a diameter of 1.4 kilometers and a length of four, were put forward.

Some were willing to go even further out to escape the Earth. The cyclers, specially excavated asteroids placed on circular orbits between the Earth and Mars, could carry nearly 220,000 people every two years in a self-sustaining environment. During the general census of 2070, the Martian population was counted at nearly 2 million inhabitants, almost half of them being immigrants landed in the past thirty years. Further out, the first permanent nomad settlements were established in the Asteroid belt by ex-orbital colonists heading out in home-built spacecraft to the new frontier.

The solar system's colonization was further advanced by the development of new technologies, such as the Plasma Combustion Chamber (PCC). Experiments to improve the efficiency of the fusion powerplant led scientists at the L-5-2 colony to develop the prototype of a new type of space drive. The PCC uses high energy arcs to convert almost any fine matter or gas to a plasma state and jettison it at high velocity to create thrust. Although the initial tests were plagued with technical problems, the PCC proved much more efficient than the massdrivers and chemical rockets in wide use for spaceship propulsion.

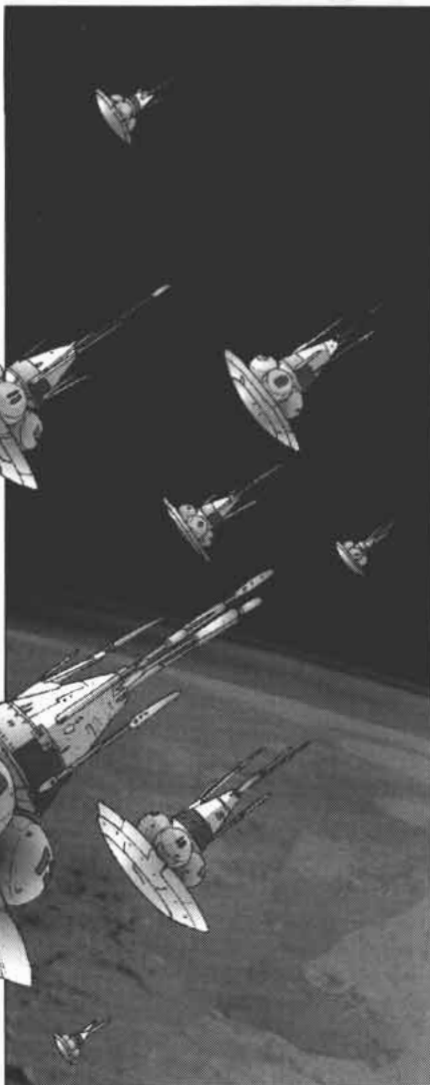
▼ PROJECT NEW EARTH

Meanwhile, the Venusian atmosphere was getting a lot clearer. The reactive metals relentlessly sent from Mercury combined with the atmospheric gases to form carbonated dust falling on the surface. The initial complaints from astronomers and ecologists subsided as the conditions on Earth's sister planet actually improved. There was a scientific bonanza as the effects of long term bombardment and atmospheric models were studied, and the surface was now directly observable. The most optimistic scientists even talked about terraformation and possible colonization.

What would happen next took the entire world by surprise. In the early months of 2070, ten mysterious rockets were launched from the orbital facilities of Boeing-Mitsubishi. Their projected trajectories led to Venus, but BM officials decline to comment. Not three weeks later, robot OTVs were dispatched from the Belt-based Westmuller Ltd mining station to rendezvous with the newly discovered Stanton II comet. No explanations were offered.

On March 1st, 2072, Project New Earth officially began. The rockets descended in the Venusian atmosphere, releasing their cargo of genetically engineered bacteria and algae. Both immediately started processing the soil and atmosphere to make them compatible with Terran biology. Two years later, the Stanton II comet, its orbit modified by the small fleet of tugs attached to its flanks, entered the Venus' orbit. Many thought the comet would disintegrate in the upper atmosphere, but this would have ruined the terraforming process. Instead, the comet was placed in a stable, easy to reach orbit to serve as a refueling point for the many ships and shuttles that brought people and equipment to the new world.

Immense titanium fins were first installed at the settlements' projected polar locations to cool down the boiling hot ground. Large quantities of aerogel, an isolating polymer/ceramic substance, were manufactured to form the foundations and outer walls of huge arcologies. Within a few years, small settlements dotted the Venusian poles.



DEPRESSION ◀

By the second half of the twenty-first century, the biosphere of planet Earth was in sorry shape. Widespread droughts and floods were battering the cities. The ozone layer was very much depleted, even though programs limiting the production of ozone-depleting gases had been in place for decades. The development of new non-polluting energy production alternatives were only slowing down the problems caused by Mankind's insatiable need for power-sources. Underdeveloped countries turning into fully industrialized nations only compounded the problem, as an increasing member of people wanted the comfort of modern life in their homes, requiring still more energy.

During the eighties, the social and environmental pressures caused the collapse of several nations. Civil war, epidemics, and balkanization provoked a major exodus toward space and the colonies. Entire villages pooled their life savings to buy a patch of land on a colony somewhere in the Solar System in the hope of improving their living conditions.

EXODUS ▼

In early 2081, the provisional Terran government, an evolution of the United Nations council, took refuge in orbit. Several of the more prominent nations of Earth were members of this council, which also included members from orbital colonies. To reflect this change, the council officially took on the name of United Solar Nations.

The inhabitants of Mars declared their independence in the summer of 2085. Despite their best efforts, there was little the beleaguered Earth nations and corporations could do to stop them, and by 2086, all Terran authorities had been removed from the red planet. This did not solve any problem, however, and civil conflicts would rage for many years before a native Martian political structure would evolve.

During this time, the terraforming of Venus was progressing. Financing corporations started establishing bases in the northern polar region by the first quarter of 2086, landing entire prefabricated factory units to help in the construction of future arcologies. Corporate personnel were shuttled in from orbital colonies at a rate of several thousand per month.

By the 2090s, the governments of Earth lost any remaining authority they might have had over the space colonies. The fall of the last superpowers and the subsequent loss of their spacefaring capacity isolated the Earth from the rest of Mankind.

TOUGH TIMES ▼

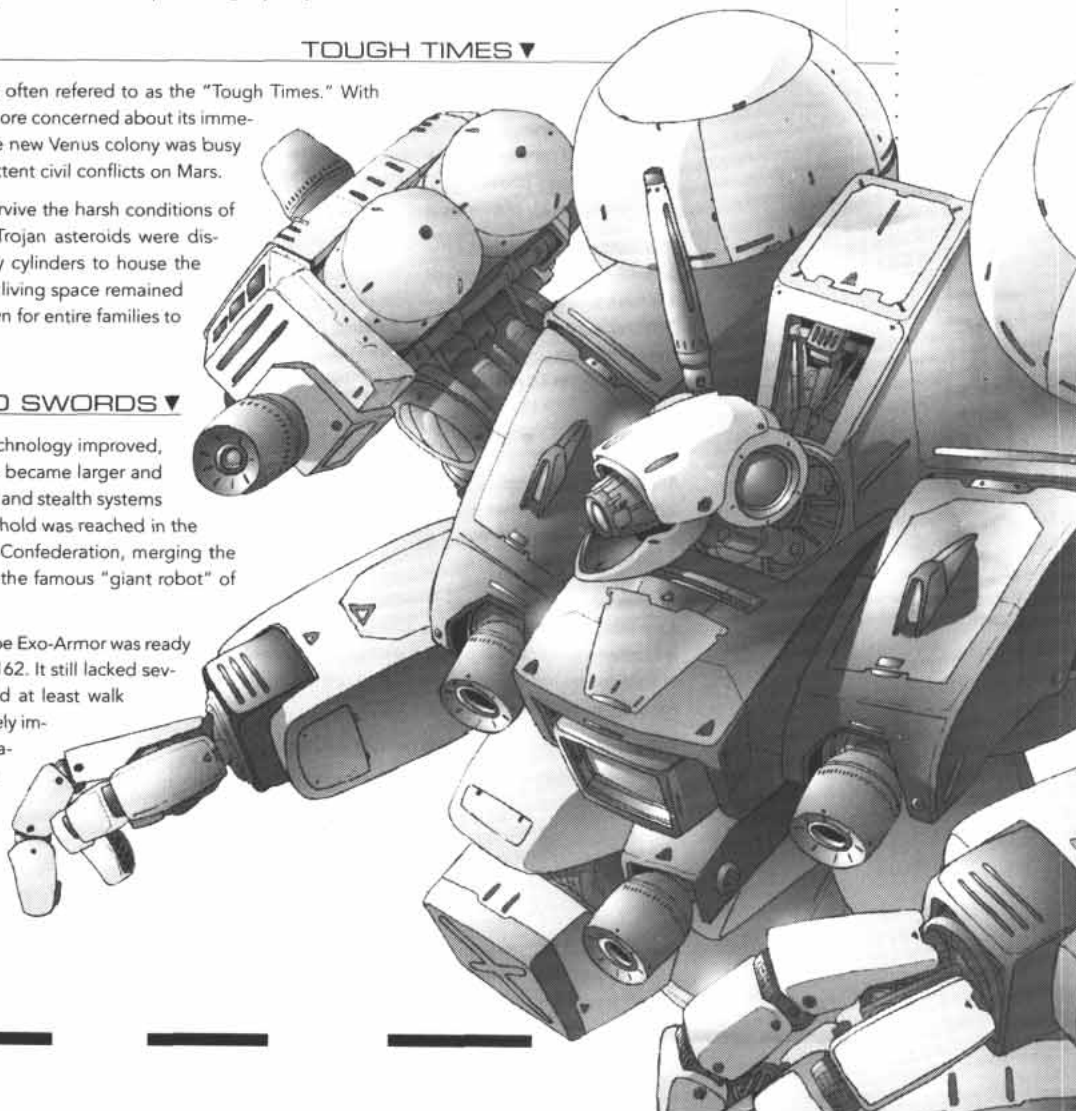
The period from the 2120 to 2180 was often referred to as the "Tough Times." With Earth in disarray, each settlement was more concerned about its immediate survival than politics or trade. The new Venus colony was busy settling down, while there were intermittent civil conflicts on Mars.

The Jovian settlements struggled to survive the harsh conditions of their environment. Many of Jupiter's Trojan asteroids were dismantled and used to build new colony cylinders to house the growing Jovian population, but limited living space remained an endemic problem. It was not unknown for entire families to share a few rooms.

PLOWSHARES INTO SWORDS ▼

As time went by, the general level of technology improved, and with it the science of war. Exo-Suits became larger and more powerful, carrying advanced ECM and stealth systems to disguise their increasing size. A threshold was reached in the 2150s, when technicians of the Jovian Confederation, merging the engineering tug and the exo-suit, built the famous "giant robot" of science fiction.

After months of testing, the first prototype Exo-Armor was ready to be shown to the Agora on July 23, 2162. It still lacked several important sub-systems, but it could at least walk and fly. The representatives were extremely impressed by the performance of the machine, and approved a plan to equip the fledgling JAF with sixty Exo-Armors within the next five years.



► NEW BEGINNINGS

The resolution of the troubles on Earth signaled the end of a dark period for all. Contacts slowly resumed between settlements. It was the beginning of a new age of peace and prosperity. Once again, spaceships started making regular runs between planets, exchanging high technology products and specialized items that could not be produced locally. Even tourism saw a renaissance of sort, though the high cost of space travel restricted it to the wealthy or those ready to save for the trip of a lifetime.

▼ REUNIFICATION OF EARTH

The period of civil conflicts and unrest on Earth had degenerated into outright war in many regions as diverse groups competed for the same dwindling resources. Before long, a league of small nations had banded together under one flag and were methodically taking over as many territories as possible. The Union, as it was called, consisted mostly of European and North American states. Their aim was to unify the entire planet under one government, by negotiated alliance or by force, if necessary. Its leaders wanted to stop the bloodshed and give people the means they needed to restore the planet and earn a good living from it. The Unification War, as the drawn-out conflict came to be known, ended in 2182.

On January 1st, 2184, the Central Earth Government and Administration was founded by the victors of the Unification War. Although they did not control the entire planet, CEGA did administer North America, Europe and large parts of Africa and Asia.

▼ TITAN

Titan was first explored during the 21st century. Once it became clear that the moon was studded with organic liquids, and contained oxygen and nitrogen, it was not much of a surprise to discover primitive life (monocellular prokaryotic heterotrophs) at the bottoms of the deeper ethane seas.

In the decades prior to the Fall, there was a wide basis of Terran pro-Green sentiment, as living conditions had started to deteriorate on the home planet. Titan had (tenuous) life to protect, it was distant, and it seemed too difficult to exploit. As a result, the major Earth nations (and the reluctant spaceborne corporations) met in Reykjavik, Iceland in 2062 and signed a treaty agreeing to ban industry from the Titanian surface. The Treaty was to be ratified anew by the participants every fifty years. It did not prohibit human habitation of the surface, but with the exception of IGS' Alcott research station, no one wanted to live there.

The Treaty left open the option of exploiting Titan's upper atmosphere, which contains a significant amount of methane. By the early 22nd century, with the Jovian Confederation's population growing (and cut off from Earth's supply of organics), this was an attractive possibility. Consequently, stratospheric gas mining robot equipment was set up as early as 2128, and some small launch platforms were set up in Titanian orbit to send the products to Jupiter.

This continued for a long time, with the Reykjavik Treaty receiving its second (in absentia) re-ratification by the Orbitals, Selenians, Martians and Jovians in 2162. But in the 2180s, Bernardo Chandrasekhar's new gas-mining company THC changed the rules, claiming that the Reykjavik Treaty permitted exploitation of the surface as long as the industry was based in orbit. Building a pair of large refinery stations, he began to use huge shuttles to ferry the liquid methane to orbit, for bulk conversion into complex hydrocarbons. The Confederation government backed him up. Within a few decades, THC achieved a monopoly on Titanian commerce and became a major player in interplanetary economics.

▼ THE MARTIAN ELEVATOR

Although the skyhooks used on Earth proved to be the limits of the technology available at the time, the dream of a fully functional space elevator was not dead. Mars, in particular, was especially interested in the concept. The lower Martian gravity, combined with the smaller radius of the planet and the advances in the material field, would theoretically make such a device possible.

Neither of the Martian governments had the resources required for a project of such magnitude, but several corporations were intrigued by the idea. The Martian natural resources, when combined with the elevator, would make it economically feasible to build certain delicate spaceship components on the ground and send them into orbiting shipyards. After years of studies, the Venusian backers authorized the construction of the prototype on June 1st, 2189. The Martian orbital elevator opened officially seven years later.

The coming of the twenty-third century was heralded by a solar system at peace.

THE ODYSSEY ▼

The resolution of the troubles on Earth signaled the end of a dark period for all. Contact between settlements slowly resumed. It was thought to be the beginning of a new age of peace and prosperity — the events of 2210 would shatter that illusion.

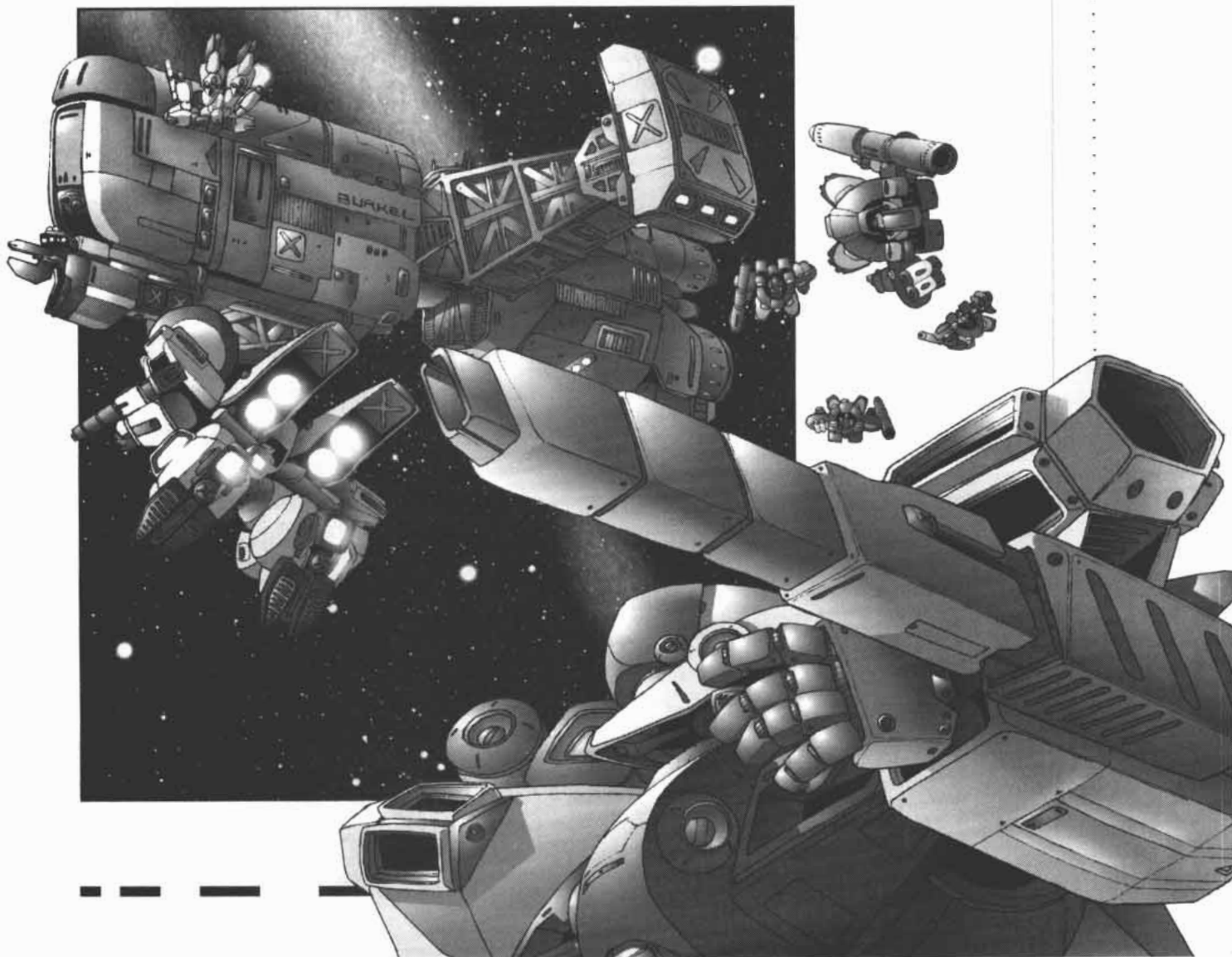
In the early 2200s, Terran scientist Doctor Agram Peyarje developed a "cyberlinkage" system for partial thought-control of machinery and vehicles. CEGA agents quickly realized that it could be used for military purposes and conscripted him. Fearful of the imperialistic views of CEGA, the scientist contacted Jovian operatives and requested political asylum. At about the same time, living creatures were discovered in the atmosphere of Jupiter. Although the two events seemed unconnected at first, they would later prove to be the starting point of a new era for humanity.

A small team of inexperienced Jovian Armed Forces pilots was sent to Venus, where the scientist was attending a seminar. They succeeded in helping Dr. Peyarje escape, but were discovered and pursued across the solar system by forces that were later revealed to be sponsored by both CEGA and Venusian interests. The fleeing group was helped first by Lunar-based rebels and later by Martian sympathizers. The Earth forces proved tenacious, however, and tried to stop them even on foreign ground. The Martian prototype orbital elevator was destroyed in the ensuing confusion.

By the time the group reached Jovian territory, an entire battle fleet was at their heels. By then, a plot to destroy Elysée, the capital-station of the Jovian Confederation, was revealed. After what would later become known as the Battle of Elysée, the station was saved, an entire CEGA battle fleet was destroyed and one of the JAF's commanding officers, the very man who directed the Peyarje mission, was arrested as a traitor.

AFTERMATH ▼

The months following the Battle were tumultuous, to say the least. CEGA officially declared its fleet to have gone rogue while a witch hunt started to find the people responsible for the whole affair. The true culprits are safely out of sight, however, and a new, troubled age has just begun...



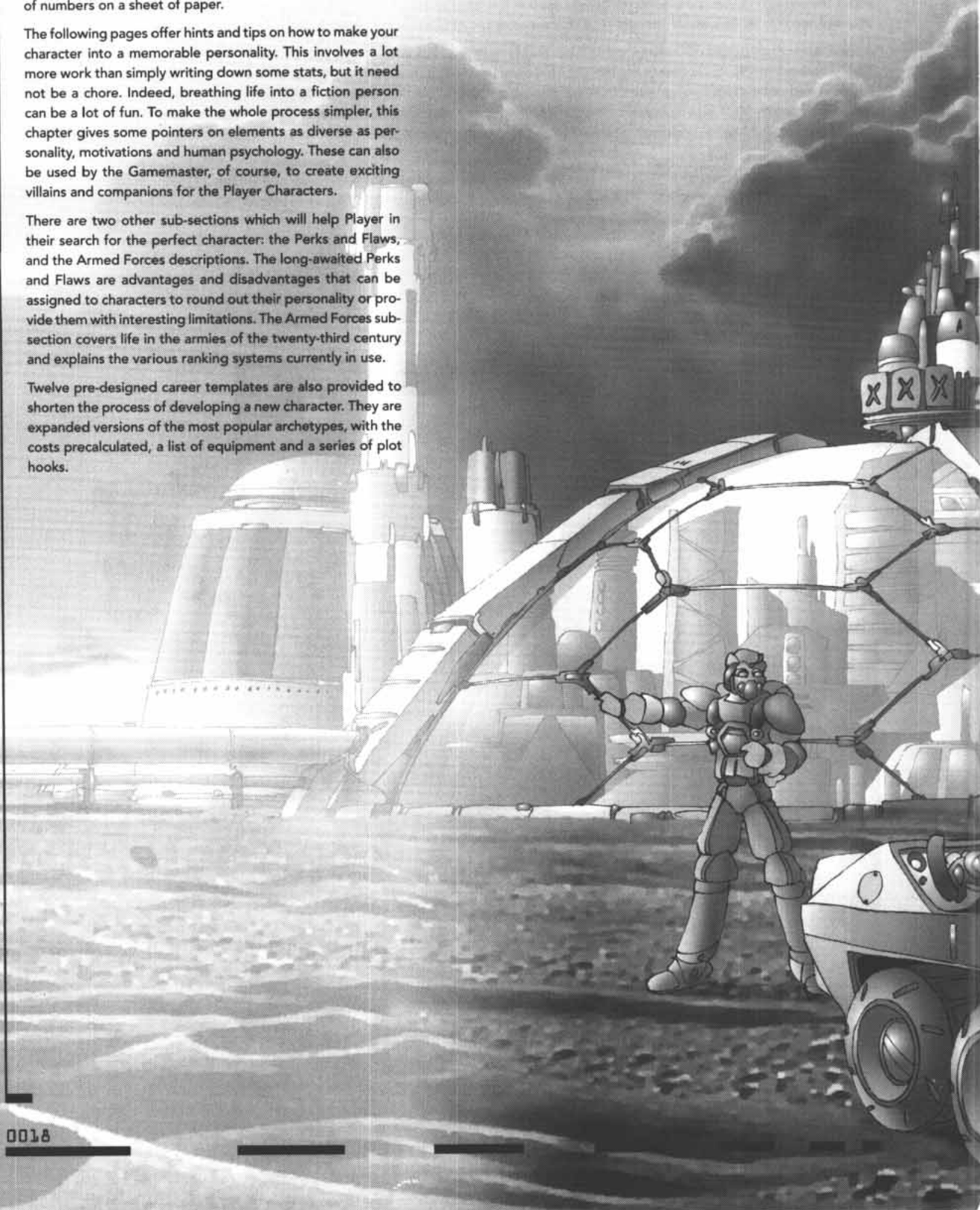
► ADVANCED CHARACTER DESIGN

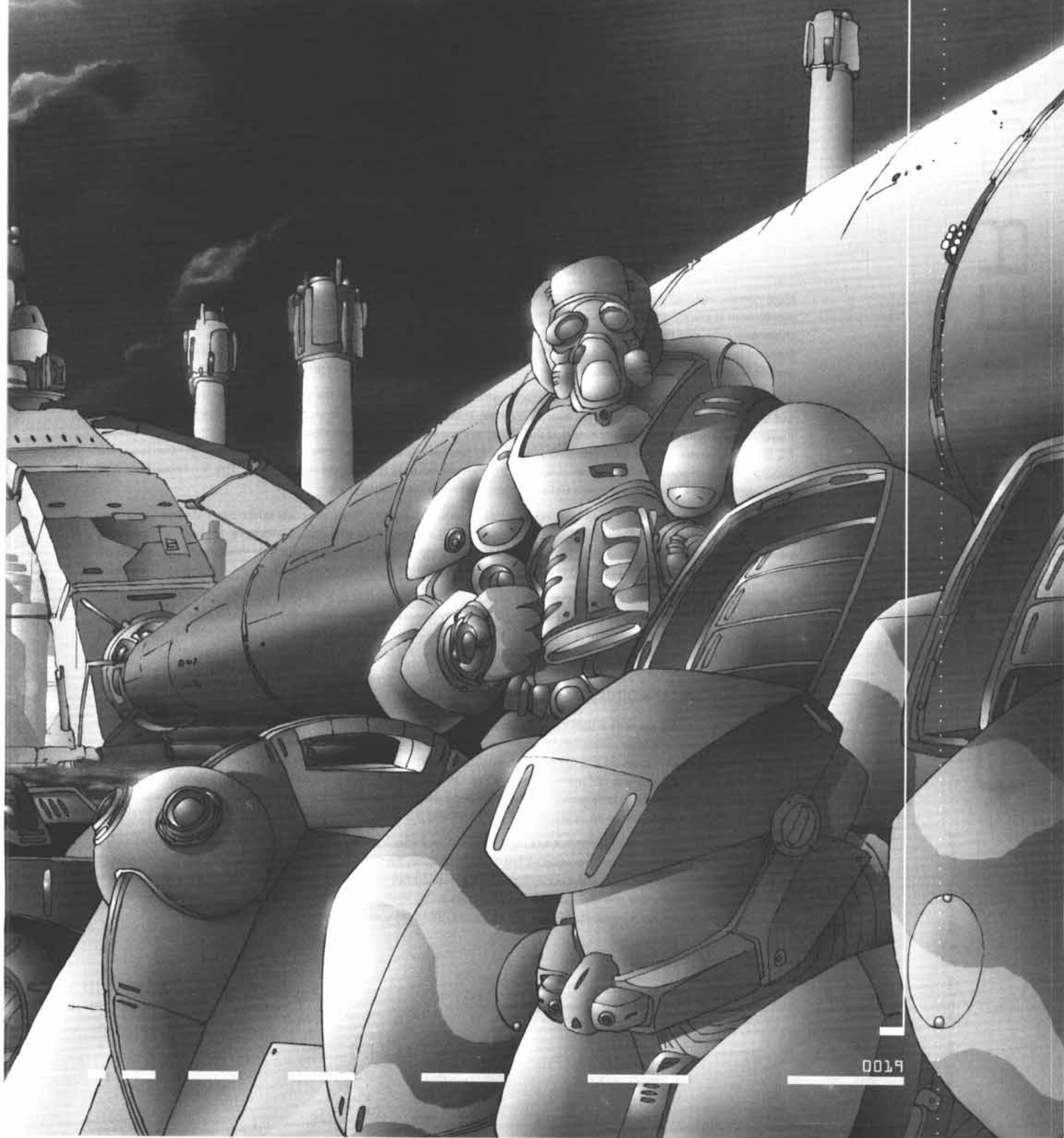
The rulebook contains the primary rules for creating a character in the setting of the Jovian Chronicles, but there is much more to a character than a simple set of game statistics. One must develop an engaging and complex personality, motivations and goals if the character is to be more than a mere set of numbers on a sheet of paper.

The following pages offer hints and tips on how to make your character into a memorable personality. This involves a lot more work than simply writing down some stats, but it need not be a chore. Indeed, breathing life into a fiction person can be a lot of fun. To make the whole process simpler, this chapter gives some pointers on elements as diverse as personality, motivations and human psychology. These can also be used by the Gamemaster, of course, to create exciting villains and companions for the Player Characters.

There are two other sub-sections which will help Player in their search for the perfect character: the Perks and Flaws, and the Armed Forces descriptions. The long-awaited Perks and Flaws are advantages and disadvantages that can be assigned to characters to round out their personality or provide them with interesting limitations. The Armed Forces sub-section covers life in the armies of the twenty-third century and explains the various ranking systems currently in use.

Twelve pre-designed career templates are also provided to shorten the process of developing a new character. They are expanded versions of the most popular archetypes, with the costs precalculated, a list of equipment and a series of plot hooks.







▶ PERSONALITIES

One of the key elements in roleplaying is coming up with a personality that is interesting to play and entertaining for others to interact with. We cannot emphasize enough on the importance of proper characterization and differentiation between Player Characters. Too often, Players select stereotypes that are too close to each other's choice, and end up stepping on each other's toes. It is vital for the Gamemaster and Players to agree before starting the campaign on what is the common link between the characters. This doesn't mean that the characters must have known each other since childhood to get along, or that they need to have a common objective. Rather, everyone should agree on having common personality traits at a very basic level. This should be done even before starting character design, since it will play an important part in the process.

For instance, half a dozen Earth characters could be in a group bent on sabotaging CEGA's efforts for planetary domination, but their motivations and methods could be so diverse (one wanting to avenge his wife's death, another doing it out of political beliefs, another one wanting to prevent massacres such as the one which occurred in his town, etc.) that they might not last very long together. Another group of characters could share one primary motivation (let's say, improving the quality of life of Belters), and would have chosen to do it together because they find they complement each other nicely. That last situation is ideal, since the Player Characters have a motivation which binds them together in a loyal group and they are complementary to each other (more on this later).

One of the more frequent problems in a gaming group is the tendency of certain characters to become loners because they just don't mesh well with everybody else. Having a common motivation is a way to keep the group together. It ensures that PCs share similar views and may form friendships (if they're not friends already) that will create a group synergy.

▼ CHARACTER COMPLEMENTARITY

Most games, even when not specifically designed with that structure in mind, follow a very cinematic process. The story moves from scene to scene, involving some or all of the characters. More often than not, a scene spotlights on one or two characters only, and this is where the difference between gaming and movies intervenes. In a movie, an actor who isn't featured in a scene goes off to do something else and has a coffee. Nobody cares. In a roleplaying campaign, Players who are not involved in a scene twiddle their thumbs, wait for their turn, get bored and throw dice at the Gamemaster.

Nothing ruins a game more than a Player Character who is under the spotlight all the time. Other Players get resentful, step out of character and spoil the fun for everybody else. This is a Bad Thing™. From the onset, the Gamemaster and the Players should work together to ensure that the characters' motivations are compatible and — pay attention now — that no PC becomes central to the storyline. Everyone should be equally important, although in different ways. Gamemasters should be wary of aggressive character designs from Players who seek to be good at everything. This is a telltale sign that other participants in the campaign will dislike him and sabotage his interventions.

Remember at all times that this is roleplaying, not television or the movies. The deceptive similarities between the genres should not blind the Gamemasters to the particularities of interactive games. Everyone wants to be the hero and everyone wants some spotlight. To ensure that, Players should collaborate during character creation to make characters which will complement each other and will NEED one another throughout the campaign.

In general, characters should be specialized, not universally competent. That specialty is often referred to by gamers as a "schtick." every character's schtick should be unique and fairly specific. In many instances, Gamemasters should consider a character's schtick before asking for a skill check. If the situation is one covered by the PC's schtick and isn't of a critical nature, the GM might consider granting automatic success to the Player.

▼ ORIGINAL PERSONALITIES

In an attempt to come up with a truly original personality, some Players go out of their ways to incorporate some truly outrageous features into their characters. In truth, who really cares if someone's PC is scarred yet handsome, is ambidextrous but has lost two fingers on the left hand, is in great physical shape but has a heart condition, is arrogant and self-confident except in the presence of women, and has Roy Orbison's voice? This is hardly going to make the campaign more exciting for the Players and is only going to give the Gamemaster a headache trying to remember all these insignificant details. Instead, it is much easier to take a stereotype and bend it a little.

For instance: "Anna is your typical hotshot exo-armor pilot — audacious, competent and attractive — but she's terminally ill with cancer and has no more than two years to live." Depending on the Player's take on that situation, it can lead to several story threads. Anna may not care about surviving battles and becomes reckless in combat, or she is single and may want to experience true love before she dies, or she simply wants to try everything before her time is up. By simply twisting a stereotype, everyone gets a better handle on the character. It's simple, vivid and original.

CHARACTER STEREOTYPES ◀

As we mentioned just above, stereotypes are great time-savers and can really help get a game started fast. Several players just don't know what they want to play at first, especially when it's a new game or a new world. Character classes, so often used in other games, are a great help for character creation, but provide no assistance in making an interesting roleplaying personality. After careful observation of animation (and movies, for that matter), several stereotypical personalities emerge which can be a great help to Players in a rush to get character creation over with. We provide a short list of stereotypes below. We recommend that no more than two or three Players belong to the same stereotype, so that Gamemasters can vary their storylines.

3.2

THE VETERAN ▼

No one is more experienced than Veterans. They're at the peak of their professions, with little else to learn in their trade. Most of the time, they're highly respected, sometimes even quoted. They may wish to retire after a full life and aren't allowed that luxury, or they may cling to their duties when they should relinquish them. Gamemasters should allow Veterans to buy a few high level Skills, but should also insist that they purchase several level-one Skills in order to represent a broad base of experience acquired over the years. Optionally, Veterans can start with 25% more points than other characters, but may not improve their top four skills during the campaign.

3.2.1

THE ROOKIE ▼

Unlike Veterans, Rookies start as relatively incompetent characters. They should be allowed to grow more rapidly, however, and Gamemasters may allow Players who have Rookie characters the option of only using part their starting Skill Points at the beginning. As the campaign progresses, they should be allowed to purchase their Skills by only paying for the difference between the skill level costs, not the full levels, for the remainder of their starting Skill Points. For instance, improving a Simple Skill from level 2 to 3 would only cost 4 points, not the normal 8 points. This allows new Players who are not yet familiar with the world an opportunity to adjust their characters as the campaign progresses.

3.2.2

THE TOUGH GUY/GAL ▼

Tough Guys/Gals are a staple of Japanese animation. Self reliant and often irritating because they're always right, these jack-of-all-trades care little about professional improvement, only about getting the job done. They often have a broad range of professional skills which come in handy in almost any situation. Optionally, Gamemasters can give them 25% fewer Skill Points to start with, but can allow them to purchase any Skill as a Simple Skill up to level 2. Several Tough Guys/Gals are mercenaries, selling their services to the highest bidder until the next job. One note: scientists can be Tough Guys/Gals. They aren't physical types, but they're just no-nonsense types with a gruff exterior and an adverse attitude.

3.2.3

THE EXOTIC CURIOSITY ▼

In typical *anime* campaigns, Exotic Curiosities are those very unusual characters with a weird or composite background. They think and act differently, and are often puzzled by those "strange human customs." While this often applies to alien creatures, it can also be true for synthetic beings, artificial intelligence or "Frankenstein" creations. Traditionally female, they are often good-looking and candid. There are no hard-and-fast rules for these characters, but we recommend that Gamemasters remove 10 points from their starting Skill Points pool and give them some unusual and effective Perk in the campaign. For instance, an artificial intelligence might have instant access to a whole network of computers, which it could access regardless of its location.

3.2.4

BLUEBOOKING ▼

Too often borrowed without due credits, Bluebooking is undoubtedly one of Aaron Allston's greatest contributions to roleplaying. Using this technique, Gamemasters and Players may expand the background and life of Player Characters without wasting precious game time. They can flesh out the characters' personalities, or simply run solo adventures without bothering the other Players. The trick? Writing about it...

3.2.5

Players should equip themselves with small notebooks (in Allston's campaigns, they were using little Blue Books, thus the technique's name). Between games, Players should elaborate in writing on one of their characters' aspects. It can be in any writing style, from a monologue, a personal log, a short story, anything. They leave the notebook in the GM's hands, who reads it between games and scribbles additional notes in the notebook, then returns it to the Players. This way, complete side stories can be created between games with no one feeling left out. The process is obviously longer than playing an actual game, but offers tremendous rewards — such as playing a moving romantic scene and not having to stare at a fellow male Gamemaster in the eyes.

Nowadays, with the advent of the internet, it's also possible to Bluebook by email. It's every bit as good as the notebook technique, but has the further advantage of being a tad faster.

end of section 3.2 character stereotypes

► CHARACTER PSYCHOLOGY

Roleplaying characters are more than a simple bunch of statistics and a background, they are a personality that Players adopt for an evening. Because of this, they should have a relatively well defined psychological profile — a Player should know how a character behaves and what his inner feelings are. Most roleplayers will slowly get to know their character's psychology over play and no system can fully replace this experience. It is possible, however, to help Players think about character psychology from the get-go. This section allows them to more easily create a believable, consistent and enjoyable character. The following suggestions and systems exist to do just that.

▼ MOTIVATION

People do things for reasons. It is important to gain some understanding as to why a character has taken a certain path in his life and how he wishes to change it. Roleplaying characters are generally very dynamic and assertive, and few people can maintain this sort of active lifestyle without someone or something pushing them forward. Players should select one or more words (or even short phrases) that sum up their motivations on a basic level.

Motivations need not be highly complex, they just need to help answer the question as to why a character acts a certain way. A character who is a JAF pilot need not have a psychologically complex fixation with the power of spacecraft — having a sense of duty toward his nation can be just as valid, if not more so. Motivations do not need to be cast in stone, but they should provide Players with a signpost as to their character's behavior. A character who is loyal will probably not betray a friend, even if the rewards are great for doing so.

Character motivations are limitless, but the following list provides some of the most typical: Amusement, Anger, Childhood Tragedy, Curiosity, Duty, Faith, Greed, Heroism, Justice, Knowledge, Nationalism, Power, Thrill Seeking, Truth, Vengeance. Note that especially powerful motivations can be reflected by certain Character Flaws, such as Code of Honor or Quirk (see *Character Perks and Flaws*, facing page).

▼ SELF AND FACADE

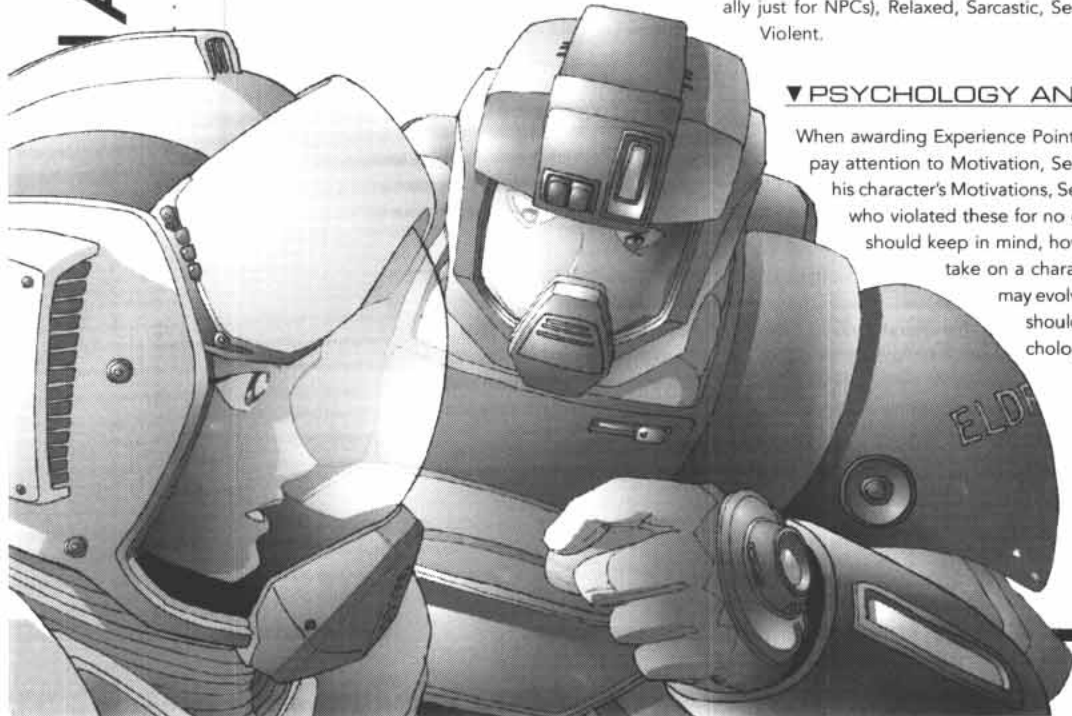
Self and Facade are other shortcuts that allow Players to rapidly define a few basics about their characters' personalities without going into a university-level dissertation. "Self" (inner mode of behavior) refers to the character's internal psychology: what he believes and how he views the world. "Facade" (external mode of behavior) refers to how the character actually behaves: the public face he puts on for others and the attitudes he projects. Self is what others will first notice about a character's personality. Most people have different Self and Facades, reflecting the fronts we all put up to hide our true selves. These fronts may exist because of a sense of duty, decorum or insecurity. A few people are very uncomplicated and have the same Self and Facade, but they are quite rare.

Choosing a Self and Facade is simple. Players should just find a word (or very brief phrase) that captures the essence of their inner or outer selves. Although this word will surely not capture all aspects of the character's psychology (there are many types of "fanatics" or "boisterous" people, for example) it does not have to — Self and Facade are there to serve as guidelines, not a hard and fast definition.

Possible Self and Facades are virtually limitless, but to help you along what follows is a list of common ones: Angry, Arrogant, Bored, Bully, Charming, Cheerful, Curious, Daredevil, Depressed, Friendly, Frightened, Funny, Heroic, Honorable, Insecure, Loner, Loving, Nervous, Obsessive, Opportunistic, Paranoid, Perfectionist, Protective, Proud, Psychotic (usually just for NPCs), Relaxed, Sarcastic, Seductive, Selfish, Spiteful, Stern, Suave, Violent.

▼ PSYCHOLOGY AND EXPERIENCE

When awarding Experience Points for roleplaying, Gamemasters should pay attention to Motivation, Self and Facade. A Player who respected his character's Motivations, Self and Facade should be rewarded; one who violated these for no good reason should not. Gamemasters should keep in mind, however, that Players may discover a new take on a character or that the character's psychology may evolve, in which case Player and Gamemaster should discuss changing one or all of the psychology signposts.

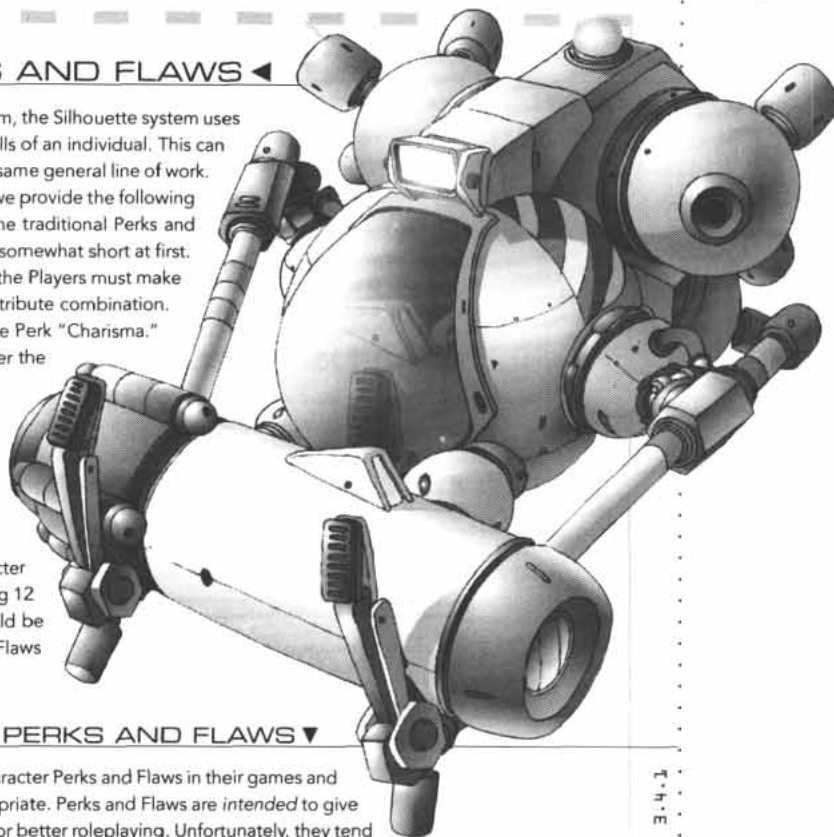


CHARACTER PERKS AND FLAWS ◀

In order to keep the dice rolling and the bookkeeping to a minimum, the Silhouette system uses a fairly small range of numbers to describe the capabilities and skills of an individual. This can lead to characters that are fairly similar, especially if they are in the same general line of work. To help Players create unique characters with unique capabilities, we provide the following Character Perks and Flaws. The basic Attributes cover many of the traditional Perks and Flaws used in other roleplaying settings, and so the list may seem somewhat short at first. Before asking the Gamemaster to generate new Perks and Flaws, the Players must make sure that what they have in mind does not fall under a certain Attribute combination. For example, a popular singer will have a high INF rather than the Perk "Charisma." An obese person would have a very high BLD and a low FIT rather than the Flaw "Obese."

Each Perk costs a certain amount of Skill Points (SPs) and each Flaw "gives back" a certain number of SPs. These are the same Skill Points that are given to purchase Skills, so a character with more Flaws than Perks can gain additional Skills or Skill Levels, while a character with more Perks will start with fewer Skills.

There is no strict limit to the number of Perks and Flaws a character can have. In order to prevent excess we recommend not exceeding 12 points of Flaws (20 in a Cinematic game). The Gamemaster should be the final arbiter as to whether a character has too many Perks or Flaws and may choose to exclude some entirely (see below).



SELECTING PERKS AND FLAWS ▼

Gamemasters should be very careful about allowing the use of Character Perks and Flaws in their games and they should not be afraid of imposing strict limits on what is appropriate. Perks and Flaws are *intended* to give Players a variety of options to help define their character, making for better roleplaying. Unfortunately, they tend to bring out the "munchkin" (see page 61 of the rulebook) in many Players — the variety of options, each with a cost or benefit, drives some to make the most of the system, purchasing a ludicrous number of Perks and Flaws to get special abilities and extra Skills. The number of angst-ridden, addicted, blind, one-armed combat monsters wanted by the law is legion in the halls of roleplaying history.

Solutions to this problem include limiting the number or gravity of Flaws and Perks. You can tell Players they can get only one Perk and one Flaw, forcing them to take only that which is really important for their character concept. Alternatively, you can limit the number of points they can get from Flaws. We recommend 12 as a good general limit, but bringing this down to 5 can work well when dealing with munchkin instincts.

Gamemasters should also have final approval over all Perks and Flaws and make their decision according to two criteria: whether they fit the character concept and the campaign concept. The first criterion prevents blind Exo-pilots; the second prevents multimillionaires in a campaign about pioneers scrounging for resources. Gamemasters can also choose to remove some Perks and Flaws altogether. Those who believe in letting Players define their character's psychology without concern for points can eliminate personality-related Flaws.

Gamemasters should also not impose unfair costs for Perks. If the campaign concept calls for everyone to have military rank, be police officers, or be political leaders, then the Players need not pay for the relevant Perks. Gamemasters may have them pay for elevated rank or especially good reputations, but the campaign "base line" should be free.

GAINING PERKS AND FLAWS DURING PLAY ▼

Roleplaying characters often evolve quite substantially during the course of a campaign, going, for example, from being untested pilots to national heroes. Changing Character Perks and Flaws can reflect this evolution. Only Perks and Flaws listed as *Acquired* can be gained over the course of a campaign, however.

In general, the Gamemaster should be the sole arbiter of Perks and Flaws once play begins. Experience Points need not be spent every time the Player Characters pick up a few new contacts and they gain no points when the government starts hunting them — these are just part of character evolution. Gamemasters should try to roughly balance new Flaws with new Perks, however, or else the PCs' lives will become no fun at all. GMs should be especially careful when doling out highly debilitating Flaws or ones that change the character concept (like Flashbacks or Blind). Optionally, GMs could allow Players to purchase new Perks by investing Experience Points. Treat these as Simple Skills, with the level equal to the lowest cost of the Perk. The Perks can then be improved like any Skill. For example, a character buying a new Subordinate would pay 4 Experience Points for a "level 2" Subordinate and could then improve it up to level 5 (one step at a time) as any Skill (see *Jovian Chronicles*, p. 125, for costs). Wealth is commonly purchased in this manner.

▼ CHARACTER PERKS

Perks are natural characteristics, aptitudes or social benefits that often prove useful to the character. Like all things in life, however, many Perks are not universally beneficial. Some Perks (usually social ones) have potential downsides that are listed along with them. Gamemasters and Players should keep these downsides in mind, but they should not outweigh the benefits of the Perk.

It is also important to distinguish Innate and Acquired Perks & Flaws. Innate Perks & Flaws are characteristics about the character which he or she was born with, and which he cannot normally get rid of. These can only be bought during character creation. Acquired Perks & Flaws, however, are not genetic in nature and can be acquired at any time during the course of a campaign (or a character's life).

● ACCELERATED HEALING (INNATE)

COST = 4 ▼

Thanks to some natural vigor, the character heals faster than other people (though he is not tougher because of it). The normal healing rules are used (see page 118 of the rulebook), but the character needs only 75% of the required time. Accelerated Healing has no downside and is incompatible with the Slow Healing Flaw.

● ACUTE SENSE (INNATE)

COST = 2 PER SENSE (CHOOSE ONE) ▼

The character has one above-average sense, such as vision or hearing, and tends to notice fainter signals than other people. He gets a +1 modifier for Notice checks based on that particular sense. Good Sense has no downside, though overstimulation would be more painful than usual. Obviously, a character with the Blind or Deaf Flaws may not have Acute Vision or Acute Hearing.

● AMBIDEXTROUS (ACQUIRED)

COST = 1 ▼

The character can use either hand for tasks requiring manual dexterity, though he may not attack twice per action. Ambidextrous has no downside. Kindly note that a One-Armed character cannot be Ambidextrous at the same time.

● ANIMAL COMPANION (ACQUIRED)

COST = 1-4 DEPENDING ON THE USEFULNESS OF THE ANIMAL ▼

The character has a faithful pet, steed or other animal companion. This animal is both well trained and emotionally bonded to the character, which means that it will stay by his side other than (perhaps) the occasional romp through the neighborhood. The downside of an Animal Companion is responsibility: pets must be fed, walked and housed.

● ANIMAL KINSHIP (INNATE)

COST = 2 ▼

The character has a "touch" with animals, both wild and domestic. Domesticated animals will respond well to training and instructions, granting the character a +1 when dealing with them. Wild animals are less likely to attack the character and may even respond to some very basic commands (specifics are left to the Gamemaster). Animal Kinship has no downside, although many people with this Perk become vegetarians out of empathy.

● AUTHORITY (ACQUIRED)

COST = 3 ▼

The character represents the authorities. He could be a policeman, a SolaPol agent, a Military Police agent, etc. The effect of this Perk depends largely on the circumstances — policemen have no extra authority outside their jurisdiction. The potential downside of Authority is responsibility: the character will likely have to follow a strict code of conduct, report for duty and follow orders.

● CONNECTIONS (ACQUIRED)

COST = 3 TO 7 POINTS PER ALLY, 1 AND 5 POINTS PER CONTACT ▼

The character has one or more useful connections. These can be close allies who would be willing to help the character no matter what, or more casual acquaintances with special skills or connections of their own. The cost of the connection should vary according to such factors as loyalty, influence, accessibility, resources, etc. This Perk does not cover casual, personal relationships (such as a lover, friends and neighbors) unless they are particularly useful or dedicated.

Allies are connections who are willing and able to help the character, even in dire circumstances, without asking for much in return (at least not immediately). Examples include a brother who is also a police sergeant or a friend in the military.

Contacts are connections who will not necessarily go out of their way to help the character without promise of recompense. They generally provide useful information or equipment, but will not come to the rescue at their own risk. Typical contacts include a snitch within a criminal cartel, a smuggler or a forger.

The potential downside of Connections is reciprocity. Contacts will expect either to be paid in cash or by being owed favors. Allies are less demanding, but are likely to call for help when they need it. Turning down an allies' call for help is a sure way to lose that ally.

● FAKE IDENTITY (ACQUIRED)

COST = 3 PER FAKE IDENTITY ▼

The character has more than one identity. Going beyond the odd forged passport, he has a complete, fully detailed life on the side, with separate dwelling, job and identification papers. People attempting to track the cover identity back to the character will find it very difficult to do. The potential downside of Fake Identity is maintenance. The character needs to spend time and money keeping his alter ego current, doing such things as making bank transactions, subscribing to newspapers or even making appearances as that person.

● FAMOUS (ACQUIRED)

COST = BETWEEN 2 AND 5 POINTS DEPENDING ON THE DEGREE OF FAME ▼

The character is famous. He can be a well-known artist or a political figure. In certain situations, famous will work for the character — people will readily help him or provide access to restricted areas. Fame's potential downside is lack of anonymity. The character may be recognized wherever he goes and may be watched by the press and other interested parties. This can make subtlety or stealth very difficult.

● FAVOR (ACQUIRED)

COST = 1 TO 5 ▼

Someone important or a powerful group owes the character one or more favors. This debt is real and known by both the character and the indebted party, and is likely to be honored, all things being equal. The character may call in this debt when convenient, although story elements may limit his opportunity to do so. The downside of a Favor is resentment: if the character is not careful, the indebted party may feel he is being taken advantage of.

DEBT COST □

Financial Debts	Debts of Honor	Point Cost
5,000 credits	key favor	1
25,000 credits	multiple favors	2
100,000 credits	major boon	3
500,000 credits	multiple boons	4
1,000,000+ credits	life boon	5

● LIGHT SLEEPER (ACQUIRED)

COST = 2 ▼

The character sleeps lightly and awakens at the slightest noise. He cannot be surprised when sleeping and gets a normal defense roll. Light Sleeper has no downside, other than that it may be difficult to get a good night's sleep in a noisy environment.

● LUCK (INNATE)

COST = 4 ▼

The character is exceptionally lucky. Once per session, the Player may elect to reroll a Fumble. Alternatively, he can choose to switch the modifier of a single die roll before making the roll — for example, turning a -3 into a +3. Lucky has no downside and is incompatible with Bad Luck.

● MACHINE-TOUCH (INNATE)

COST = 5 ▼

The character is exceptionally good with machines and seems to understand them. He can purchase the Tinker skill as a Simple skill. Machine-Touch has no downside.

● NIGHT VISION (INNATE)

COST = 3 ▼

The character's eyes need very little light to see. As long as there is at least a small amount of light present, he can ignore the penalties for poor lighting (see rulebook, page 114). This perk is of no help in total darkness, however. The downside of Night Vision is that the character's eyes are sensitive to bright lights.

● PHOTOGRAPHIC MEMORY (INNATE)

COST = 3 PER POINT ▼

The character has an excellent memory. Whenever a Knowledge roll is made to recall information previously seen, heard or read, the rating of the Perk is added to the dice roll. If the character has three or more points of Photographic Memory, any Knowledge-related Skills are considered Simple for learning cost. The downside of Photographic Memory is that it's extremely difficult to blank out traumatic events. Nasty Gamemasters can give PCs with that Perk some recurring nightmares about these difficult events.

● PRESTIGE (ACQUIRED)

COST = 2 TO 4 DEPENDING ON THE SCOPE AND POWER OF THE INFLUENCE ▼

The character is either a recognized authority or carries significant prestige in a certain social, geopolitical or professional sphere. Although this is not a guarantee that the character will get his way all the time, his opinion will be listened to and he can find others to support him if need be. Typical areas of influence include: a city, the military, big business, the media and a government. Prestige's downside is notoriety: others in the same field may seek the character out or target him.

● PROPERTY (ACQUIRED)

COST = 3 TO 7 DEPENDING ON SIZE AND POWER OF THE PROPERTY ▼

The character owns a substantial and useful piece of property. This could include a nightclub, an *Inari*-class liner, a pirate ship, or a mansion used as a headquarters. This Perk should only be used for key story props and settings — the owner of a pirate ship should have this Perk, but an accountant on Venus with a condo and car does not need it. This Property is also not part of the character's assets (see Wealth Perk), and it is expected that 2% of that amount is spent quarterly on maintenance and related salaries. If the character can't make his payments, there's always the loan sharks...

If at some point the character wants to sell his property and exchange it for Wealth, he may do so by rolling a Business check against the point cost for the Property. He will get a Wealth Perk equal to (Property Cost + MoS - 1).

PROPERTY COST □

Property Value	Quarterly Maintenance	Point Cost
250,000 credits	5,000 credits	3
1,000,000 credits	20,000 credits	4
5,000,000 credits	100,000 credits	5
10,000,000 credits	200,000 credits	6
50,000,000+ credits	1,000,000 credits	7



● QUICK LEARNER (INNATE)

COST = 2 ▼

The character learns quite rapidly and can gain extra benefit from tutors who try to impart their knowledge upon them. Quick Learners subtract one from the number of months of tutelage required to learn a Skill from a tutor, although the minimum remains one week. Those teaching a Quick Learner also get a +1 bonus to their Teaching Skill test to reduce XP cost of a Skill increase. For more information, see *Jovian Chronicles Rulebook*, p. 125. Quick Learner has no downside, except the envy of fellow students who must work harder to learn the same thing.

● RADIATION RESISTANCE (INNATE)

COST = 2 ▼

The character is exceptionally resistant to radiation poisoning. When making Health checks for status following a radiation exposure, a +1 modifier is applied to all dice rolls. Radiation Resistance has no downside.

● RANK (ACQUIRED)

COST = 0 TO 12 ▼

The character is a recognized member of a powerful military, paramilitary or civilian organization. This station will give him authority in certain circles as well as access to resources, contacts and equipment. **Military Rank** indicates membership in an organized military force with authority from one of the solar nations. **Paramilitary Rank** indicates membership in a force that wields armed might and is organized along military lines, but does not serve as the main defense force of a nation. Paramilitary forces may or may not operate with government authority. **Civilian Rank** indicates membership in an organized and powerful non-military organization, such as a powerful zaibatsu, a government department or an organized crime family. Civilian Rank is categorized according to generic stations and should be purchased only if membership confers a real benefit. Note that military rank has a fixed cost, but civilian and paramilitary rank is provided with a cost range depending on the power and influence of the group. The potential downside of Rank is responsibility. Members of the military or other powerful groups have to follow codes of conduct, abide by regulations and follow orders from superiors.

■ RANK COSTS

Rank	Military	PM/Civilian
enlisted/member	2	0-2
junior NCO/veteran member	4	2-4
senior NCO/elite member	6	4-6
junior officer/assistant-director	8	6-8
senior officer/director	10	8-10
general officer/senior director	12	10-12

● SENSE OF DIRECTION (INNATE)

COST = 2 FOR 2D, 3 FOR 3D ▼

The character seems to have a natural compass in his head. He always knows where he is located and never seems to get lost. In space, characters with the 3D Sense of Direction never get dizzy and can always figure their orientation in relation to the spacecraft, station or nearest celestial body. This cannot be taken with the Space Sickness Flaw. Sense of Direction has no downside.

● STRONG IMMUNE SYSTEM (INNATE)

COST = 3 ▼

Characters with a Strong Immune System are especially resistant to disease and the effects of drugs. These characters get a +1 to Health tests made against the contagion and virulence of diseases, as well as the Potency of a drug or toxin. See *Disease*, p. 79, and *Jovian Chronicles Rulebook*, p. 119, for more details on these topics. A Strong Immune System has no inherent downside other than the fact that the character will also resist beneficial drugs such as analgesics. This Perk is incompatible with Weak Immune System Flaw.

● SUBORDINATES (ACQUIRED)

COST = 2-5 PER SUBORDINATE ▼

The character has one or more faithful underlings. These Subordinates are professionally bound to serve the character in a well-defined way, but do so above and beyond the call of duty. The Player and Gamemaster should develop the conditions of service as well as the identities of all subordinates. These characters can become excellent supporting characters in a campaign. Typical subordinates include: manservants, bodyguards and executive assistants. The downside of Subordinates is responsibility: they must often be paid and they may legitimately ask for assistance from time to time.

● THICK-SKINNED (INNATE)

COST = 4 ▼

The character has a high pain threshold and better resists to injuries. Thick-skinned characters add five points to their basic Stamina and recalculate their damage thresholds accordingly. This Perk is normally innate, but anyone with martial training (Hand-to-Hand skill equal to 3 or better) could acquire this Perk at character creation or during the campaign. Thick-Skinned has no downside.

● WEALTH (ACQUIRED)

COST = 3 POINTS PER LEVEL, 1 POINT PER LEVEL IF NON-RENEWABLE ▼

The character has money. Lots of it. Exactly how much depends on the character's rating. A Business skill check is multiplied by 5% to determine how much money can be withdrawn within the hour. If the character has extra time to properly shuffle his assets, he can often withdraw larger sums: 6 hours give a +1 bonus to the skill check, a full day gives a +2, a week gives a +3 and a month gives a +4 (not cumulative). Making a withdrawal temporarily reduces the character's Wealth rating by 1 for a duration equal to the period listed in the table below. That's the time it takes to "reset" the assets. If another withdrawal is made during that period and the Business roll is a fumble, the Wealth Perk is permanently reduced by one level. The character points invested in the Perk are lost. Optionally, characters can have non-renewable Wealth, that indicates a fixed amount of cash that is not making money for itself. The Wealth reduction from spending in this case is permanent.

This Perk can be bought during the campaign. Treat the Perk as a Simple skill. The potential downside of Wealth is responsibility. The wealthy must maintain their fortunes, taking at least some interest in their holdings. Tax audits and lawsuits may also be targeted at wealthy characters.

WEALTH COST

Assets Value	Period	Point Cost
50,000 credits	12 hours	1
250,000 credits	1 day	2
1,000,000 credits	3 days	3
5,000,000 credits	1 week	4
10,000,000 credits	1 month	5
50,000,000 credits	3 months	6

CHARACTER FLAWS

Flaws are hindrances that gets in the way of the character's life. Some of them are little more than quirks that make social interactions a little more difficult. Flaws can be removed later on during the campaign through good roleplaying and a liberal amount of Experience Points. Like the downside of Perks, some Flaws have potential upsides, small benefits that come with a hindrance. These upsides should never outweigh the penalties of the Flaw.

Getting rid of a Flaw requires two things. First, the Player must spend an amount of Experience Points equal to three times the number of points that the Flaw gives. Secondly, the Flaw must be eliminated through roleplaying (e. g. a Wanted character must defeat or otherwise dissuade his hunters, a Deaf character must undergo corrective surgery). If a Flaw is resolved through roleplaying but XPs are not spent, the Gamemaster can replace the Flaw with another one of equal cost or by another occurrence of the same one. In the previous example, the character who has defeated his pursuers might be hunted by another group or end up picking up a Nemesis.

● ADDICTION (ACQUIRED)

COST = ADDICTION OR DEPENDENCE RATING - 3 (AS APPROPRIATE, ROUND UP) ▼

The character is psychologically or physically addicted to something. It might be drugs, it might be adrenaline, it might even be sex, but he needs regular doses of it. The character is considered either *dependent* or *addicted* to a drug. Characters "addicted" to an activity (sex, danger, etc.) are considered *dependent* on that activity. For more details, see *Addiction*, p. 76. Note that a character can be both *addicted* and *dependent* on the same drug. Addiction has no upside.

● ALLERGY (INNATE)

COST = -1 FOR A MILD ALLERGY, -3 FOR A SEVERE ONE ▼

The character is allergic to certain food, items or chemical compounds. This can range from a mere inconvenience to a deadly danger. When the character is exposed to the allergic agent, a Health test is made against a Threshold of 5. If failed or fumbled, Mild Allergy causes constant itching and scratching, giving an action penalty equal of -1. A severe allergy is much more dangerous: if the test is failed, the victim receives a Flesh wound; if fumbled, a Deep Wound. These must be stabilized according to the usual wound rules. Allergy medicines give a bonus to the HEA roll: +1 for off-the-shelf tablets, up to +4 for special antihistaminics.

● AGE (SPECIAL)

COST = -4 (YOUNG), -2 (OLD) ▼

The character is either unusually young or old, which may impose limits on his freedom of movement and on how seriously others take his opinions. Young characters are considered to be young teenagers (13-16 years) and will have a great deal of trouble being taken seriously by adults, may have to attend school and may not be able to get into adult establishments like bars. Old characters are considered senior citizens (65+), may also have problems with respect and may have health problems. The potential upside of Age is attitudes: juvenile misbehavior may be forgiven and older characters may benefit from some respect from the young.

Optionally, the Gamemaster can impose Attribute and Skill caps to reflect the effects of age. Young characters may have a maximum BLD and KNO of 0 and may not have any Skills at Level 3. Old characters may have a maximum AGI and FIT of 0.

● AMNESIA (ACQUIRED)

COST = -2 ▼

The character has no recollection of his life up to a few days or weeks ago. This Flaw should be severely monitored by the Gamemaster, because it can easily play havoc with a campaign. The potential upside of Amnesia is unknown allies. Some friends from the character's past life may be willing to help him, although some enemies may well be close behind.

● ANIMAL ANTIPATHY (INNATE)

COST = -1 ▼

Something about the character is disturbing to animals, both domestic and wild. Domesticated animals are less likely to respond to commands or stay calm in his presence and he suffers a -1 penalty to animal handling and Riding tests. Wild animals are more likely to attack the character and, even if they don't attack, will respond aggressively to his presence. Animal Antipathy has no upside and is incompatible with the Animal Kinship and Animal Companion Perks.

● BAD LUCK (INNATE)

COST = -5 ▼

The character is constantly plagued by bad luck. Once per game, an opponent may reroll a Fumble. Alternatively, the Gamemaster can choose to switch the result of a die roll — for example, turning a +3 into a -3. The Gamemaster, however, may not use this to kill the character outright, only to make his life miserable. Bad Luck has no upside and is incompatible with the Luck Perk.

● BELIEFS (ACQUIRED)

COST = -1 TO -3 DEPENDING ON THE NATURE OF THE BELIEF ▼

The character strongly believe something that is generally not accepted and can expose him to ridicule in the mainstream: asteroids are hollow and contain alien artifacts, there are ghost ships sailing between the planets, etc. This belief could even be dangerous, leading the character to take huge risks, such as heading out for a "hollow asteroid ship" with no supplies.

● BLIND (ACQUIRED)

COST = -5 IF PERMANENT, -2 IF REMOVABLE ▼

The character cannot see. This condition may be temporary, the result of an accident for example, or it may be permanent, if the character cannot have his eyes replaced for any number of reasons. The character suffers a -2 modifier to his Notice checks and a -4 to all combat actions. A blind person cannot perform activities which require vision. Blindness has no upside.

● BLOODLUST (ACQUIRED)

COST = -3 ▼

The character is either inherently mean and vicious or suffers from a lack of control in combat due to desensitization or dehumanizing training. When in battle, he will attempt to kill his opponent by any means possible. He'll never accept a surrender, nor will he surrender or retreat permanently himself. When prisoners must be taken, they live only as long as they are useful to the character. Characters suffering from Bloodlust who wish to overcome their deadly instincts must pass a PSY test against a Threshold of 5. Bloodlust has no upside.

● CODE OF HONOR (ACQUIRED)

COST = -1 TO -4 DEPENDING ON DEPTH OF THE CODE ▼

The character lives by a code of honor. The Player and Gamemaster should define this code in terms of how stringent it is and how seriously the character takes it. Note that "honor" can mean many things to many people, so it may take some time to decide exactly what this code entails. A Code of Honor's potential upside is respect: characters who behave in a consistently honorable manner — especially when it puts them at a disadvantage — may gain the trust and admiration of other honorable people.

● CRIMINAL BACKGROUND (ACQUIRED)

COST = -1 TO -2 DEPENDING ON THE SEVERITY OF THE CRIME ▼

At some point in his past, the character committed a criminal act. He may have done some prison time or gotten away free, but the incident continues to haunt him in some way. This could entail a criminal record making it hard to get a job or respect or "old friends" continuously appearing in awkward situations. Criminal Background's potential upside is contacts: at times these "old friends" can be somewhat useful.

● CURSE (ACQUIRED)

COST = -2 ▼

The character is under a curse. Whether it is real or imagined is to be determined by the Gamemaster along with the Player. Regardless, however, it should affect the character in tangible ways. This characteristic is more akin to a tragic destiny than to a supernatural "hex." The Player should choose one aspect of the character's life (love life, job, friendships, finances, etc.) that continuously refuses to "work out."

● DEAF (ACQUIRED)

COST = -4, -2 IF REMOVABLE ▼

The character cannot hear. This condition may be temporary, the result of an accident for example, or it may be permanent, if the character cannot have his ears replaced for any number of reasons. The character suffers a -1 modifier to his Notice checks, and cannot perform activities which require hearing.

● DEBT (ACQUIRED)

COST = -1 TO -5 ▼

The character owes someone a substantial debt, which can include money but also debts of honor or patronage. The person to whom the character is indebted may be tolerant or demanding, but either way the debt is a recurrent drain on the character's time or resources. The potential upside of a debt is a contact: the person who the character owes may be able to be of some help occasionally, although it usually means ending up further in debt. The Player and the GM should agree on how much and when the character is expected to reimburse his debt.

■ DEBT COST

Financial Debts	Debts of Honor	Point Cost
50,000 credits	key favor	-1
250,000 credits	multiple favors	-2
1,00,000 credits	major boon	-3
5,000,000 credits	multiple boons	-4
10,000,000 credits	life boon	-5

● DEDICATED (ACQUIRED)

COST = -1 TO -3 DEPENDING ON THE DEMANDS OF THE DEDICATION ▼

The character is dedicated to a certain cause or a powerful, all-consuming goal. In the case of ideals, the character will follow them whenever possible. The more extreme form of this characteristic is fanaticism. If the dedication is to a specific goal, the Player and the GM should determine it together and ensure it is largely unattainable, giving the character a strong motivation throughout the campaign. Dedication's potential upsides are contacts and respect. Others dedicated to the same cause (or who seek the same goal) may be willing to help a truly dedicated character, although they may also expect such help themselves.

● DEPENDENT (ACQUIRED)

COST = -1 TO -4 ▼

The character must take care of someone: an adopted child, a relative, etc. This responsibility includes care, protection and friendship and should be quite demanding on the character's schedule. In addition, enemies might attempt to use the dependent against the character. A Dependent's potential upside is aid: the other character may be helpful in certain situations.

DEPENDENT COST ◇

CP/SP total	Cost	CP/SP total	Cost
5/10	-4	10/30	-2
10/20	-3	20/30	-1

● FLASHBACKS (ACQUIRED) COST = -2 ▼

The character has sudden flashbacks of his past, especially in stressful situations. The Player and Gamemaster should define just what these flashbacks are and what trauma they stem from. Specific triggers for the flashbacks can also be chosen. Characters experiencing flashbacks must make a WIL or PSY roll against a Threshold of 4 to act. Flashbacks have no upside.

● HEAVY SLEEPER (INNATE) COST = -1 ▼

The character sleeps like a brick and is very hard to awaken. Heavy Sleepers must make PER or Notice tests with a -3 penalty to see if they awake in a dangerous situation. Heavy Sleeper has no upside and is incompatible with the Light Sleeper Perk.

● INFAMOUS (ACQUIRED) COST = -1 TO -4 DEPENDING ON THE SEVERITY AND EXPOSURE OF THE INFAMY ▼

The character has a bad reputation. This reputation may or may not be deserved, but it sticks to the character like the proverbial bad penny. Infamy can denote unpleasant reputations (e. g. a notorious cheat) or something more terrifying (e. g. an underworld assassin). Infamy's potential upside is fear: those with terrible reputations may be intimidating.

● INSOMNIA (ACQUIRED) COST = -1 ▼

The character has difficulty sleeping or is plagued by constant nightmares. He is constantly tired. Optionally, the Gamemaster may impose a -1 penalty for actions that require endurance and prolonged concentration. Insomnia has no upside.

● LAME (ACQUIRED) COST = -4 IF PERMANENT, -2 IF REMOVABLE ▼

The character has a medical problem in one or both legs. This condition may be temporary, the result of an accident for example, or it may be permanent, if the character cannot have his legs fixed for any number of reasons. The character suffers a -1 modifier to movement-related Skill checks, and cannot perform activities which require jogging or faster movement. Being Lame has no upside.

● LIAR (ACQUIRED) COST = -1, -3 IF MYTHOMANIAC ▼

The character generally does not tell the truth. Whenever he speaks, he will lie if it is practical or gets him off the hook. A more serious version of this is the full-blown mythomaniac, who cannot tell the truth and keeps inventing stories about himself and the people around him. Being a Liar has no upside.

● MECHANICAL INAPTITUDE (INNATE) COST = -1 ▼

The character is all thumbs when it comes to mechanical or electronic devices. Any Skill test involving the use of a complex machine suffers a -1 penalty. Mechanical Inaptitude has no upside.

● NEMESIS (ACQUIRED) COST = -2 TO -5 DEPENDING ON POWER, INTENTIONS AND FREQUENCY OF APPEARANCE OF THE ENEMY ▼

The character has a long-time enemy or rival. Whenever they meet, they engage in contest of wit or plain combat. If the character gets rid of his Nemesis, another one will pop up to replace him until the point cost is paid (a vengeful lover? a younger sibling?). The Player and Gamemaster should cooperate to create the Nemesis and determine how the rivalry began. Nemesis' potential upside is allies: the enemy of your enemy may be your friend.

Although a Nemesis will undoubtedly cause a Player Character no end of trouble, this Flaw can be among the best in terms of campaign development. This Flaw gives a Gamemaster all the justification he needs to create a dogged master villain who pops up at the most inopportune times. GMs should put a great deal of effort into Nemesis, both because they are a lot of fun and because they will undoubtedly be very important to the character they are hunting. Nothing is quite as memorable as a good villain. An interesting variation can be noble Nemesis, who hunt the Player Character to right a wrong or because it is their duty. These are especially vexing to many Players because they cannot be disposed of without a second thought — they're good guys too, after all.

● OBLIGATION (ACQUIRED) COST = -1 TO -3 DEPENDING ON SEVERITY AND FREQUENCY OF THE OBLIGATION ▼

The character is under some kind of obligation. He may have a steady job and be required to show up on schedule, or he can have to obey certain people. The Player and the Gamemaster should cooperate to define the scope of the obligations and the reasons why the character is under orders. Note that characters who have the Authority or Rank Perks cannot purchase Obligation tied to the same employment that confers these benefits — the obligations are just part of the territory. They can, however, have other Obligations. Obligations has a potential upside in contacts: superiors and fellow employees can occasionally be of assistance.

● ONE-ARMED (ACQUIRED) COST = -2, -4 IF PERMANENT ▼

The character is missing an arm. This condition may be temporary, the result of an accident for example, or it may be permanent, if the character cannot have it replaced for any number of reasons. The character suffers a -1 modifier to any manipulation-related Skill checks, and cannot perform activities which require both hands. One-Armed has no upside.



● PARANOID (ACQUIRED)

COST = -1 ▼

The character believes that some people are in league to cause him harm. Anything bad that comes to him is automatically the result of this conspiracy. Anyone refusing to believe in said conspiracy is automatically part of it and probably out to get the character — or so he thinks. Paranoia has no upside.

● PHOBIA (ACQUIRED)

COST = -2 FOR MILD PHOBIA, -4 FOR SEVERE PHOBIA ▼

The character has an unreasonable fear of something. It might be a certain item, a situation, a color, or an animal. *Mild Phobias* mean that the character suffers a -1 action penalty when in the presence of the object of his phobia, due to nervousness and distraction. *Severe Phobias* mean that the character must pass a WIL roll against a Threshold of 4 to function at all in the presence of the object and even then suffers a -1 action penalty. Phobias have no upside.

Cost = -2 for Mild Phobia, -4 for Severe Phobia. Gamemasters can reduce the cost to -1/-3 for uncommon objects of Phobia (such as the fear of ocean in a campaign occurring in the Belt).

■ COMMON PHOBIA OBJECTS

Object	Medical Name	Object	Medical Name
Altitude	acrophobia	Loneliness	monophobia
Animals (choose one)	zoophobia	Night	nyctophobia
Blood	hematophobia	Noise (sudden or loud)	brontophobia
Enclosed Spaces	claustrophobia	Open places, space	agoraphobia
Crowds	demophobia	Opposite Gender	androphobia or gynephobia
Darkness	scotophobia	Plants (choose one)	—
Sunlight, light	photophobia	Sex	erotophobia
Death (symbols of)	necrophobia	Snakes	ophidophobia
Dirt	rupophobia	Spiders	arachnophobia
Fire	pyrophobia	Strangers	xenophobia
Flying	aerophobia	Subterranean Places	troglophobia
Germes and Viruses	mysophobia	Technology	technophobia
Holy Places	hagiophobia	Water	hydrophobia
Insects	entomophobia		

● POOR (ACQUIRED)

COST = -2 ▼

The character does not have much money and has no secure source of income. Characters who obtain such a source during play will find forgotten debts catching up with them until they pay off this Flaw in XPs. Poor characters cannot afford anything above the basics without making arrangements through roleplaying. Poverty has no upside.

● POOR SENSE (ACQUIRED)

COST = -2 PER SENSE (CHOOSE ONE) ▼

The character has one or more especially poor sense. He has trouble noticing and distinguishing stimulus that are faint or muffled. The character suffers a -1 penalty to all Notice tests related to the affected sense. Poor Sense has no upside.

● QUIRK (ACQUIRED)

COST = -1 PER QUIRK (MAX. -2) ▼

A quirk is a small personality flaw or habit that poses only minor limitations on actions. Quirks are intended as roleplaying aids to reward Players for giving their characters some life. This should not be abused, however, so Players receive extra Skill Points only for their first two Quirks. Common Quirks are listed below, but Gamemasters and Players should feel free to add others as long as they are not severely limiting on the character. Note that Quirks can include good habits (such as always giving to charity or taking in strangers) as long as they are mildly limiting on the character. At the Gamemaster's discretion, characters who wish to suppress their Quirk temporarily (e. g. cowards who must run into danger) may have to pass a WIL test against a Threshold of 3. Quirks have no upsides.

Common Quirks include: cowardice, cruelty, curiosity, gluttony, greed, intolerance, lacking a sense of humor, laziness, miserly compulsion, overconfidence, pacifism, pride, selfishness, squeamishness, stubbornness, vengeance fixations, and miscellaneous good or bad habits.

● RADIATION VULNERABILITY (INNATE)

COST = -2 ▼

The character is exceptionally vulnerable to radiation poisoning. When making Health checks for status, he gets a -1 modifier to his dice roll. Radiation Vulnerability has no upside and is incompatible with the Perk Radiation Resistance.

● SECRET (ACQUIRED)

COST = -2 TO -3 DEPENDING ON THE GRAVITY OF THE SECRET ▼

The character has a dark secret in his past. The Player and Gamemaster should decide on the nature of the secret, but there should always be a good reason why this elements must be kept hidden. It could be a criminal past (Criminal Background represents a known criminal past), a past indiscretion, a current illicit affair, or any number of other damaging information. If the secret is revealed and the Player does not pay the XPs to remove it, then another level to the secret, or a different secret altogether must be chosen. Secrets have no upsides.

● **SICK (ACQUIRED)**

COST = -1 TO -4 DEPENDING ON HOW SEVERE, FATAL AND DEBILITATING THE DISEASE IS ▼

The character has a serious ailment that impairs him in some way. The Player and Gamemaster should define the illness and its symptoms. An important (if medically inaccurate) distinction is between degenerative and chronic diseases. Degenerative diseases (such as cancer) will only get worse if untreated, while chronic disease are stable but debilitating. There is no upside to Sick.

The Gamemaster and Player should agree on the specifics of the disease the Player Character suffers from. Game statistics can be generated using the Disease Rules (see 5.1.3 Diseases, p. 79). Only masochistic Players and Gamemasters should give their characters highly contagious airborne diseases because they will surely end up with entire infected parties and sick NPCs. Easily controlled contagious diseases (or non-contagious ones) are much better choices.

● **SLOW HEALING (INNATE)**

COST = -4 ▼

The character heals more slowly than other people. The normal healing rules are used (see page 118 of the rulebook), but the character needs 50% more time to heal. Slow Healing has no upside.

● **SLOW LEARNER (INNATE)**

COST = -2 ▼

The character has a hard time learning in a structured or academic environment. He still benefits from teachers, but less than most. A Slow Learner must add one to the number of months required to learn a Skill with a tutor; the time can still be reduced to one week by skilled teachers, however. Those teaching Slow Learners also suffer a -1 penalty to their Teaching Skill test to reduce XP cost (see **Jovian Chronicles Rulebook**, p. 125, for more details). Slow Learner has no upside, and is incompatible with the Quick Learner Perk.

● **SOCIAL STIGMA (INNATE)**

COST = -1 TO -3 DEPENDING ON THE SEVERITY OF THE STIGMA. ▼

The character is part of a social group that has a bad reputation. People will shun him and, in the more extreme case, try to harm him. The Gamemaster and Player should cooperate to define the stigmatized group and the nature of the stigma. In the case of space-travel campaigns, Gamemasters should adjust the Flaw's cost depending on how widespread the Stigma is. To eliminate this Flaw, the character must spend appropriate Experience Points, but also either prove he is no longer a part of the group or somehow end the stigma toward the group — something that could take the length of a campaign. Stigma's potential upside is contacts: other members of the stigmatized group may be willing to cooperate for mutual benefit.

● **SPACE SICKNESS (INNATE)**

COST = -1 PER POINT ▼

The character gets sick and nauseous when in free fall. Whenever the character finds himself out of a gravity environment, he gets a penalty equal to the rating of this Flaw to all his dice rolls. There is no upside to Space Sickness.

● **SPLIT PERSONALITY (ACQUIRED)**

COST = -1 TO -4 (GM'S DISCRETION) ▼

The character has two or more personalities. They are usually different aspects of the same person, though only one is in control at any time. What triggers the switch from one personality to the other is highly variable and depends on the individual. In general, stress is the most common trigger. Each personality has its own set of mental Attributes (CRE, INF, KNO, WIL, PSY) and its own Perks and Flaws. Ideally, all personalities should have the same point cost, but the Gamemaster may diverge from this in specific cases. Player and Gamemaster should cooperate to create all the identities.

The Gamemaster should be in control of personality-switching unless the Player proves himself willing to roleplay the switches spontaneously without looking to maximize his advantage. The cost of the Flaw should be used as a guideline as to how useful the personalities will be. A -1 version could see personality switches happening at useful times about 50% of the time and switches rarely endangering the Character. The -4 version, however, should see personality switches coming at the most embarrassing or downright dangerous times. The tough-as-nails killer suddenly becomes a wallflower when he's about to interrogate a witness, for example.

● **THIN-SKINNED (INNATE)**

COST = -4 ▼

The character has a low pain threshold, putting him out of commission on even the lightest injuries. Thin-skinned characters subtract five points from their Stamina and recalculate their Damage Thresholds accordingly. Thin-Skinned has no upside.

● **WANTED (ACQUIRED)**

COST = -1 TO -5 ▼

Somebody is currently chasing the character. Whether or not this is justified, the character will have to face relentless, often-armed pursuers that appear at the worst time (Gamemaster's choice). The Player and the Gamemaster should cooperate to define the hunters and the reason for the hunt. Wanted usually indicates a group hunting the character or an individual doing so for professional reasons — a personal enemy is covered by the Nemesis Flaw. Masochistic Players can combine Wanted and Nemesis. The cost of the Flaw should be based on the power of the hunter, his intentions and the frequency of his appearances. Wanted's potential upside is allies: others hunted by the same group may be helpful while on the lamb.

● **WEAK IMMUNE SYSTEM (ACQUIRED)**

COST = -3 ▼

Characters with a Weak Immune System are especially vulnerable to disease and the effects of drugs. These characters get a -1 penalty to Health tests made against the contagion and virulence of diseases, as well as the Potency of a drug or toxin. See *Disease*, p. 79 and **Jovian Chronicles Rulebook**, p. 119, for more details on disease and drugs. Weak Immune System is often an innate character element, but is listed as an Acquired Flaw because it can result from severe disease. A Weak Immune System has no inherent upside, though the character will also be less resistant to beneficial drugs such as analgesics.

▼ SAMPLE PERK AND FLAW PACKAGES

The following examples illustrate how Character Perks and Flaws can work together to create character types. None of these characters are whole, they need both game statistics and complete backgrounds to be ready to play, but they should give **Jovian Chronicles** Players an idea of how to use Character Perks and Flaws.

● BLANK SLATE

TOTAL COST: -2 ▼

A mystery to everyone including himself, the Blank Slate woke up one morning with no memory of his previous life. He has absorbed new Skills relatively quickly, but is still hunted by mysterious people from his past.

Perks and Flaws: Light Sleeper (2), Quick Learner (2), Amnesia (-2), Social Stigma (Illegal, -2), Wanted (-2)

● CON ARTIST

TOTAL COST: 3 ▼

A mainstay of bars and backstreets around the solar system, con artists make their way through life by fleecing others. Some play small games, convincing strangers to "lend" them ten or twenty credits; others go for the big scam, ending up much richer and with more dangerous enemies.

Perks and Flaws: Acute Sense (vision, 2), Connections (minor contact, 1), Luck (4), Criminal Background (-1), Debt (-2), Liar (-1)

● DERANGED KILLER

TOTAL COST: -10 ▼

Psychotic and vile, serial and spree killers continue to plague the 23rd century. This is an extreme example of Perk and Flaw choices, just to show Players and Gamemasters the lengths that are possible if reasonable limits are not imposed. This is **not** suggested as a Player Character type.

Perks and Flaws: Light Sleeper (2), Bloodlust (-3), Flashbacks (-2), Quirk (cruelty to animals, -1), Secret (-3), Wanted (-3)

● DETERMINED ROOKIE PILOT

TOTAL COST: 3 ▼

Archetypal heroes, determined pilots come to the military ready and willing to prove their worth. They are ambitious and able, but do have a tendency to alienate their fellows. Indeed, not everyone lives and breathes "by the book."

Perks and Flaws: Quick Learner (2), Rank (enlisted, 2), Sense of Direction (3D, 3), Code of Honor (soldier's code, -2), Dedicated (strong patriot, -1), Quirk (overachiever, -1)

● FUGITIVE

TOTAL COST: -4 ▼

On the run from the law, Fugitives must try to blend in with their surroundings and avoid legal attention. Some are hardened criminals who have escaped from rightful imprisonment, while others are desperately seeking to clear their names.

Perks and Flaws: Fake Identity (3), Light Sleeper (2), Dedicated (proving his innocence, -2), Nemesis (SolaPol Agent, -3), Secret (-2), Wanted (-2)

● GANG LEADER

TOTAL COST: 3 ▼

Street gangs and other small criminal groups are often the "entry level" of larger criminal empires. The leaders of these gangs are generally tough, vicious and hungry for more power.

Perks and Flaws: Connections (street contacts, 2), Rank (local crime family, 2), Subordinates (gang, 5), Addiction (-2), Criminal Background (-2), Infamous (-1), Quirk (mean-spirited, -1)

● INDEPENDENT TRADER

TOTAL COST: 4 ▼

A staggering number of unattached merchants ply the trade routes between the major powers, usually by carving out a small niche market thanks to inside connections. They usually operate a small ship that is still not entirely theirs and keep their eyes open for the big score.

Perks and Flaws: Animal Companion (pet ferret, 1), Connections (multiple trading contacts, 3), Property (Mule freighter, 5), Code of Honor (-2), Debt (1 million credits, -3), Quirk (prone to rambling, -1)

● MUSIC STAR

TOTAL COST: 3 ▼

Even spacers need entertainment, so a variety of music stars hit the scene every year. Earth, Jupiter and Venus have the most active music scenes, but some stars travel the solar system giving concerts and promoting international successes during demanding tours.

Perks and Flaws: Connections (music industry contact, 3), Famous (3), Wealthy (3), Addiction (pain killers, -1), Obligation (record company contracts and touring requirements, -2), Quirk (charming, -1), Secret (drug addiction, -2)

● OLD TIME SPACER

TOTAL COST: 2 ▼

Nothing beats experience. The Belt is full of miners and explorers who have spent their lives in space and know the ins and outs of that life better than anyone else. This package gives Players an example of a well-balanced character, who nevertheless has many Perks and Flaws.

Perks and Flaws: Property (Anopheles mining ship, 6), Radiation Resistance (2), Sense of Direction (3D, 3), Subordinate (first mate, 2), Age (old, -2), Beliefs (asteroids contain alien artifacts, -1), Dependent (teenage niece, -2), Dull Sense (Hearing, -2), Quirk (long winded, -1), Weak Immune System (-3)

● POLICE DETECTIVE

TOTAL COST: 2 ▼

Crime and punishment are constants of civilized life and all the solar nations maintain some form of police force. Investigators and detectives are the brains of the police force, analyzing crimes and tracking down criminals.

Perks and Flaws: Authority (3), Rank (detective, 2), Code of Honor (-2), Quirk (obsessive, -1)

CAREER PACKAGES ◀

In order to simplify the character generation process, the following pages provide twelve different potential careers for Player Characters. These represent some of the more typical occupations for the "heroes" of Jovian Chronicles roleplaying games. These are not complete characters that are ready to be played as is, rather they present basic Attribute and Skill selections (and costs) so that players need only worry about the few leftover points to customize their character. Gamemasters in need of a quick Non-Player Character can, however, make use of any of these sets of stats as is. Each career contains nine elements.

The description section provides a look at what the career is and how people in this occupation relate to the world of Jovian Chronicles. This should help you decide how to tie your character in with others as well as help Gamemasters get ideas for potential adventures and campaigns.

The *Typical Attributes* and *Typical Skills* sections provide the standard stats for Player Characters of this career. Secondary Traits are provided for the convenience of those using Attributes (and relevant skills) without change, but will need to be recalculated if additional Attribute (or Hand-to-Hand and Melee) levels are purchased with remaining points. A brief list of other interesting or related skills follows the standard typical skills.

The *Equipment and Cost* table provide guidelines on basic starting items. The *Typical Equipment* and *Salary* sections are the real-world advantages that come with the career. Individual Gamemasters will need to decide what the precise salary and starting equipment is on a case-by-case basis. The *Basic Costs* section gives the price in Character Points and Skill Points of the listed Attributes and Skills. Thus, anyone wanting to quickly design a character can use these costs to establish an Attribute and Skill base, using the remaining points to improve whatever Attribute or Skill deemed important by the Player.

The *Action Campaign Use* and *Intrigue Campaign Use* sections provide ideas on how career characters can become involved in different types of Jovian Chronicles campaigns. The general categories of Action and Intrigue Campaigns are explained below.

The *Possible Variations* section provides other character types closely related to the career in question. The stats provided can be used as is, or a few Skills can be added or removed to better conform to the new role.

The *Possible Subplots* section details some possible secondary story lines of subplots that can be used with characters of the career. These subplots can run for only a few adventures or the length of the campaign, giving a sense of continuity to a possibly unrelated series of adventures.

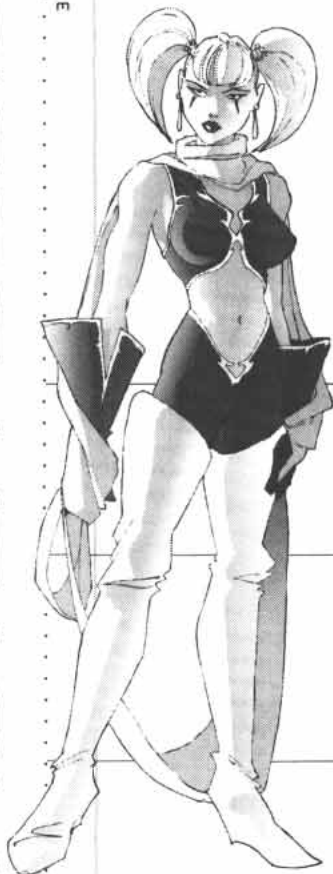


ACTION AND INTRIGUE ▼

In *Campaign Styles* (see page 223 of the rulebook), three different types of campaign "reality levels" were explained: Gritty, Adventurous and Cinematic. These three styles help determine how hard-edged and "realistic" a **Jovian Chronicles** campaign will be. They do not necessarily impose a specific type of campaign on the Gamemaster, however. All three styles can be used in a variety of settings and to tell a variety of stories.

Although many different factors can be used to categorize types of roleplaying stories and campaigns, the broad categories of Action and Intrigue are among the most useful. In Action campaigns, each game session will likely feature an exchange of gunfire or an exo-armor combat. This action will move the story forward and be the main way in which problems are resolved. Action Campaigns resemble action movies, with tension growing as the heroes (the Player Characters) face increasingly tough and ingenious opponents in mostly physical combat. Intrigue Campaigns the emphasis is placed on social interaction and manipulation. Victories are achieved not by defeating the villains in combat but by outmaneuvering them in intrigue. The very concept of "villains" is less clear in an Intrigue Campaign where no one's loyalties can be taken for granted: Intrigue Campaigns sometimes resemble espionage thrillers.

Of course, nothing precludes campaigns mixing elements of action and intrigue. Most good roleplaying campaigns will do so, just as most good thrillers or adventure films do. These categories are not set in stone, but rather serve as helpful guidelines for Gamemasters and Players.



► ENTERTAINER

Although the physical distances between settlements makes live world-class entertainment a luxury, the widespread availability of high-fidelity multimedia broadcast and reception equipment means that entertainment stars proliferate in the 23rd century. Millions watch nightly entertainment reports and video specials on their favorite stars, and rare live appearances can draw tens of thousands to a settlement.

Most media darlings began small, working local nightclub circuits or producing their own multimedia show for independent release and broadcast. Large system-wide entertainment conglomerates such as *Morning Star Entertainment* (Venus) or *Laguna Films* (Jovian Confederation) hire these artists, signing multi-release deals that cover everything from product endorsement to touring. Those with business savvy can walk away extremely rich, others become underpaid bread-winners for the conglomerate.

Media superstars are widely thought of as spoiled and selfish, especially on the rugged frontier. Those who work day in and day out to ensure their community's survival have little sympathy for the contractual woes of soap opera stars and video personalities. The behavior of brash young stars — often widely reported by the paparazzi — does little to help their reputation.

▣ TYPICAL ATTRIBUTES

AGI	0	APP	1	BUI	0	CRE	1	FIT	0
INF	1	KND	0	PER	0	PSY	0	WIL	0
STR	0	HEA	0	STA	25	UD	3	AD	3

▣ TYPICAL SKILLS

Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.
Acrobatics	1	0	Etiquette	1	1	Music	2	1	Streetwise	1	1
Dance	2	0	Human Perception	2	0	Seduction	2	1	Theatrics	2	1

Other possible Skills include Business, Computer and Electronics.

▣ EQUIPMENT AND COST

Typical Equipment:	Expensive clothing, jewelry, sunglasses, Entertainment Report magazine, luxury apartment.
Salary:	Millions per year for the top stars. Recognized stars make from 150,000 to 600,000 credits a year.
Basic Costs:	19 Character Points and 27 Skill Points.

◇ ACTION CAMPAIGN USES

Not the gritty soldiers or pilots who usually populate these campaigns, entertainers may be in over their heads and need to reach into depths of skill and determination they were unsure they had. Entertainers will also benefit from a suite of interpersonal skills largely absent from the standard action repertoire.

◇ INTRIGUE CAMPAIGN USES

Entertainers can be surprisingly resourceful. Well known and (perhaps) respected, they can open doors which would be closed to others. Using the cover of a promotional tour they can visit distant locales and gain access to forbidden areas. Entertainers tend to be underestimated and they can use this prejudice to hide their true motivations.

◇ POSSIBLE VARIATIONS

Besides the media darling superstar, many different types of entertainers are possible. Washed out has-beens or talented unknowns present plenty of roleplaying potential. The former may be bitter and in need of new venues, whereas the latter will bring energy and determination to the campaign. Skills can also be specialized to one or more forms of entertainment, be it Singing, Dancing (including elevated AGI and FIT), or another art form.

◇ POSSIBLE SUBPLOTS

Media stars are often hounded by reporters and fans and must struggle for their privacy. Stalkers are always a threat and each top star has at least one obsessive fan. Although some stars are independent, many fall under the sway of a ruthless manager or promoter who controls their finances and career. The two problems can become one if the star attracts the attention of a multi-billionaire, who may try to gather a menagerie of stars to call his own.

EXPLORER ◀

Despite extensive colonization and resettlement, much of the solar system remains uncharted territory in 2210. The far reaches of the solar system past Jovian space and large parts of the asteroid belt have had few human visitors, and new vistas and discoveries await those brave enough to commit to such journeys.

Corporations, governments, and the Intersetlement Geographic Society all sponsor expeditions which often last years on end. Those chosen for these dangerous and lonely missions are often part scientist, part pioneer, and part prospector. The search for new information is often driven by commercial interests, but some continue to simply search for new data, continuing their work as "pure scientists."

Explorers themselves tend to be a hardy and independent lot. They see settlers as somehow sedentary and even cowardly, unable to take the leap and continue pushing human habitation outward. Some of these researchers argue for an end to human expansionism, while others speak of establishing colonies around even the most remote of the Sun's satellites. Regardless, explorers are treated with respect since they follow in the steps of the folk-heroes of solar system colonization. This is especially true in Jovian space and in the Asteroid Belt.

TYPICAL ATTRIBUTES ▢

AGI	0	APP	0	BUI	0	CRE	1	FT	0
INF	0	KND	1	PER	0	PSY	0	WIL	1
STR	0	HEA	0	STA	25	UD	3	AD	3

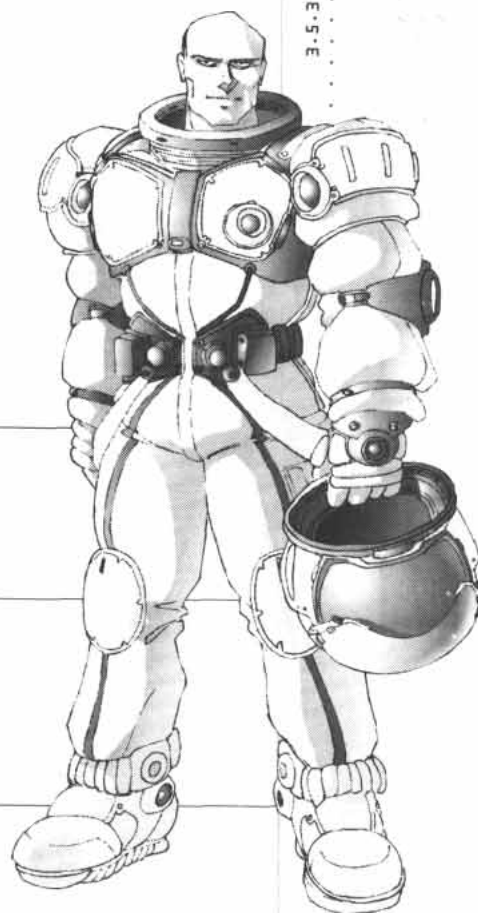
TYPICAL SKILLS ▢

Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.
Combat Sense	1	0	Earth Sciences	1	1	Navigation (Space)	2	1	Survival	2	1
Communications	1	1	Exo-Pilot	1	0	Space Pilot	2	1	Zero-G Movement	1	0

Other possible Skills include Computer, Demolitions, First Aid, Life Sciences, Gunnery (any), HTH, Small Arms.

EQUIPMENT AND COST ▢

Typical Equipment:	Exo-suit, rugged clothing, tools, astronomical navigation computer, survival gear.
Salary:	40,000 credits per year.
Basic Costs:	19 Character Points and 28 Skill Points.



ACTION CAMPAIGN USES ◇

Exploration teams are often backed by military might, especially when venturing into areas under contention such as newly uncovered mineral-rich asteroids in the Belt. Some also serve as scouts for military forces, piloting modified exo-armors or fighters into contended territory. These rugged individualists make a dynamic addition to military campaigns, injecting a dynamism that is often lacking from simple mission-based adventures.

INTRIGUE CAMPAIGN USES ◇

The discovery of a new cache of valuable resources can result in the growth of a web of intrigue around the prospector. Discovering concealed military installations would only make matters worse. The frontier individualism of an explorer can also make an interesting counterpoint to the veiled and sophisticated world of interplanetary politics and espionage.

POSSIBLE VARIATIONS ◇

Military scouts are the most common variant on the explorer career. These are full-fledged soldiers and answer to a rigid chain of command. Corporate explorers are usually more interested in a rapid bonus for the discovery of a new resource deposit than the proper scientific classification of discoveries. Planetary researchers serve similar functions as their space-faring compatriots, but use ground vehicles and explore dense geography rather than long expanses of emptiness.

POSSIBLE SUBPLOTS ◇

A featureless asteroid might house a concealed surveillance base. The explorers may be trying to deal with the consequences of contracts undertaken for unscrupulous employers. Many are seeking the find that will make them rich or get them in the most prestigious journals. Their self-centered motivations often make explorers easy to manipulate.



► EXO PILOT

Exo pilots fly top of the line exo-armors into battle. These humanoid battle machines mimic the pilot's movements while carrying large amounts of devastating weaponry. Although fleets of large spaceships remain the backbone of many space navies, flights of exo-armors have become the most well-known expression of military power. Heavily featured in propaganda and recruiting videos, the pilots of these sleek war machines have become the darlings of the media and captured the popular imagination.

Exo pilots are renowned as hotshots and glory hounds, and military trainers often struggle to rein in their enthusiasm. The Jovian Armed Forces are infamous in military circles for unofficially sanctioning the cockiness and lack of discipline of their pilots. Jovian exo-armors are the best in the solar system, and the JAF encourages its pilots to push this advantage to the edge.

CEGA pilots are expected to be exemplary in behavior as a counterpoint to their Jovian rivals. Other armed forces have fewer exo-armors and assign them to skilled veteran pilots, who usually display a disciplined manner learned from years of space time.

▣ TYPICAL ATTRIBUTES

AGI	1	APP	0	BUI	0	CRE	0	FIT	1
INF	0	KNO	0	PER	1	PSY	0	WIL	0
STR	0	HEA	0	STA	25	UD	4	AD	3

▣ TYPICAL SKILLS

Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.
Combat Sense	1	1	Electronic Warfare	1	0	Gunnery (Exo)	2	1	Small Arms	1	1
Communications	1	0	Exo-Pilot	2	1	Navigation (Space)	1	0	Zero-G Movement	1	1

Other possible Skills include Computer, Electronics, Gunnery (Space), Leadership, Melee, Space Pilot, Tactics.

▣ EQUIPMENT AND COST

Typical Equipment:	Flight uniform, sidearm, dress uniform, survival gear, access to military exo-armor.
Salary:	Varies with rank and individual armed forces. Usually 30,000 credits a year and above.
Basic Costs:	19 Character Points and 27 Skill Points.

◇ ACTION CAMPAIGN USES

The exo pilot is the archetypal Jovian Chronicles action hero. Piloting top of the line machines into battle, they are the elite warriors of the 23rd century. Any campaign involving space combat can benefit from an exo-pilot Player Character. Even outside their exos, pilots are trained soldiers who know how to handle themselves in a fight.

◇ INTRIGUE CAMPAIGN USES

Although exo pilots are largely thought of as simple fighter jocks, they can just as well fit in to an intrigue campaign. As military officers, they may well be privy to confidential information, making them targets for enemy intelligence. The armed forces of various planets also mask many secrets hidden from the very governments they are sworn to protect. Uncovering such a hidden project could well launch a campaign of military and political intrigue.

◇ POSSIBLE VARIATIONS

A rookie pilot fresh from training is a common variation on the typical exo pilot stereotype. These young "greenies" are wide eyed and often seek out dangerous missions for the thrill of it all. Grizzled veterans form a counterpoint to these youngsters. Haunted by ghosts and bearing the stains of their past, these old-timers can bring an air of somber experience to a *Jovian Chronicles* campaign.

◇ POSSIBLE SUBPLOTS

Exo pilots have captured the imagination of much of the solar system, and those who successfully complete a dangerous mission can find themselves becoming propaganda tools. Heroic pilots may soon find their own faces staring down from recruitment posters. Of course, not all pilots feel "heroic." Many missions are morally dubious at best, and moral remorse may well attract the attention of enemies looking for sympathetic agents.

MEDIC ◀

Military and civilian vessels both suffer accidents or incidental injuries to the crew, and the distances involved in interplanetary travel ensure that a medical hospital is almost certainly very far away. As such, most vessels carry at least some medical personnel aboard, if only a trained medic.

Most ship-board medics are certified by the Solar Cross, the inter-settlement medical and rescue outfit tied to the United Space Nations. Solar Cross training provides basic medical and diagnosis skills, with a heavy emphasis on emergency treatment. Medics also receive secondary training aimed at keeping wounded or ill patients stable for transfer to better medical facilities. Longer periods of study can lead to full medical certification, although individual governments usually oversee this process.

The greatest asset of space-faring medics is their ability to think on their feet. To be a certified ship's medic, the Solar Cross insists on training not only in first aid, but requires an ability to follow instructions and guidelines for critical cases. Medics travel with an extensive database of emergency procedures, enabling them to get detailed instructions even if they are unable to consult with real physicians.

TYPICAL ATTRIBUTES ▢

AGI	0	APP	0	BUI	0	CRE	1	FIT	0
INF	0	KNO	1	PER	1	PSY	0	WIL	0
STR	0	HEA	0	STA	25	UD	3	AD	3

TYPICAL SKILLS ▢

Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.
Combat Sense	1	1	Dodge	1	0	Life Sciences	2	1	Notice	1	1
Communications	1	1	First Aid	2	1	Medicine	1	1	Survival	2	1
Computer	1	1	Human Perception	1	0						

Other possible Skills include Drive, Space Pilot, Tinker, Zero-G Movement.

EQUIPMENT AND COST ▢

Typical Equipment:	Pressure suit, medical kit, medical scanner, emergency surgery kit, medical database.
Salary:	Ranges from 35,000/year for a space medic, to over 250,000/year for medical specialists.
Basic Costs:	19 Character Points and 27 Skill Points.



ACTION CAMPAIGN USES ◇

Medics are often at the forefront of military action, to patch up pilots and soldiers and send them back to the firezone. As such, medics can easily fit into a military campaign. An action campaign taking place outside the military can nonetheless benefit from the presence of a medic Player Character. Not only will they help patch together the gunslingers in the team, but they also provide a new set of skills and experiences from the standard grunts.

INTRIGUE CAMPAIGN USES ◇

In campaigns filled with espionage and double-crosses, medical personnel can be a powerful asset. The line between medical research and bio-weaponry development can be very thin, and doctors and medics can find themselves crossing into a shadowy world of governmental secrecy without any warning whatsoever. Connections within the Solar Cross can also be a valuable resource, providing a tie into the administration of the United Space Nations.

POSSIBLE VARIATIONS ◇

Full-fledged medical specialists can be interesting PCs, although their skills tend to be entirely focused on their profession. Dedicated members of the Solar Cross who travel in emergency hospital ships also make interesting characters. They will travel from hot spot to hot spot, treating the wounded and surely becoming involved in many critical events.

POSSIBLE SUBPLOTS ◇

Friendship, rivalry and romance between medics can lead to enjoyable roleplaying; relationships with ships' captains, medical officials and patients can create stories and adventures of their own. Combat medics who befriend patients only to see them die in combat can well be led to reexamine their calling.



► MERCHANT

There are few, if any, settlements in the solar system that can claim to be completely self-reliant. Resources are distributed throughout the system, so planets may have a surplus of one resource and critical shortages of others. The supply lines of the settlements are navigated by the fleet of merchant vessels (large and small) which ferry people and supplies from Jupiter to Mercury. Many of these vessels bear the seal of the Mercurian Merchant Guild, the ultimate brokers of mercantile trade in the solar system.

The Guild imposes secret strictures on its members, but the merchants who fly its flag remain a varied lot. The merchant captain's creed requires independence and resourcefulness, seeking out the best routes and markets for their supplies. Those who flout the Guild's ways can expect to be blackballed by many legitimate space ports and often become smugglers of contraband.

Merchants usually begin their careers deep in debt, borrowing huge sums to acquire a used cargo vessel. The Guild helps fund these investments, and require a percentage be paid back from revenues. Those who fail to repay their debts will usually have their membership revoked and their vessels confiscated.

▣ TYPICAL ATTRIBUTES

AGI	0	APP	0	BUI	0	CRE	1	FIT	0
INF	1	KNO	1	PER	0	PSY	0	WIL	0
STR	0	HEA	0	STA	25	UD	3	AD	3

▣ TYPICAL SKILLS

Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.
Bureaucracy	1	1	Etiquette	1	1	Haggling	2	1	Security	1	1
Business	2	1	Foreign Language	1	1	Human Perception	1	0	Streetwise	2	1
Camouflage	1	1	Forgery	1	1						

Other possible Skills include Electronic Warfare, Law, Mechanics, Navigation (Space), Space Pilot, Zero-G Movement.

▣ EQUIPMENT AND COST

Typical Equipment:	Merchant's Guild membership papers, sidearm, makeshift uniform, cargo manifest database. Full or part-ownership in a civilian cargo vessel.
Salary:	Salary depends on successful trade. Most income is usually reinvested in the vessel.
Basic Costs:	19 Character Points and 27 Skill Points.

◇ ACTION CAMPAIGN USES

Merchant captains can serve as the backbone for an action campaign. Their vessel serves as an ideal base of operations for system-spanning high-action campaigns. The search for profitable trade routes or the struggle against pirates and other rival traders, make for some very tense moments and exhilarating combats. Merchant vessels may also come under military protection when necessary, which creates an interesting dynamic between crew members and their military guardians.

◇ INTRIGUE CAMPAIGN USES

The diversity and number of merchant vessels traveling across the solar system makes them an ideal cover for covert operations. Most major powers have established so-called merchant vessels that double as intelligence gathering platforms. Others use unknowing merchant ships to transport agents and sensitive materials from planet to planet. Of course, the Guild has intrigues of its own and major factions fight shadow wars, seeking commercial advantage at any price.

◇ POSSIBLE VARIATIONS

These range from the stoic second-in-command to the people who keep outdated fusion engines from giving up the ghost. Many pirates were once merchants, and playing these corsairs of the space ways can also make for an exciting campaign. For campaigns based in a single location, the traders and buyers who purchase from the fleets are available as PCs.

◇ POSSIBLE SUBPLOTS

There are many potential subplots, including the necessity of repaying a debt or meeting a quota, or blacklisting someone who has broken Guild rules. The process of bringing a rogue trader back into the fold can make for a drawn out and interesting subplot, as can a long investigation into illegal activities taking place under the Guild's very eyes.

NOMAD ◀

Perhaps the most rugged people in the solar system, Nomads live in converted asteroids that course around the sun. Ringed by gravity wheels, Nomad planetoids provide a difficult but good life. Each asteroid is normally ruled by a chief and supports a community of a few hundred. Each Nomad works day and night to keep the "tribe" functioning.

Nomads are notoriously hard working, and intolerant of laziness and effete behavior. They play as hard as they toil, and hard-drinking nights off are a common part of their profile. Many Nomads serve tours as workers in other parts of the solar system, bringing their technical skills to the service of large corporations and sending their wages (or purchased supplies) to their clan back home.

Citizens of more sophisticated locales are usually less than tolerant with Nomad informality and raucous behavior, projecting superiority and even contempt in all their encounters. Nomads repay these attitudes by making a game of insulting and making fools of their "sophisticated" employers. Only those who show an ability to do their own work — rather than simply manage others — earn Nomad respect.

TYPICAL ATTRIBUTES ▢

AGI	0	APP	0	BUI	1	CRE	1	FIT	1
INF	0	KND	0	PER	0	PSY	0	WIL	0
STR	1	HEA	0	STA	30	UD	7	AD	5

TYPICAL SKILLS ▢

Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.
Combat Sense	1	0	Electronics	2	0	Mechanics	2	0	Survival	1	1
Dodge	1	0	Hand-to-Hand	2	0	Notice	1	0	Zero-G Combat	1	0
Earth Sciences	1	0	Intimidate	1	1	Small Arms	1	0	Zero-G Movement	2	0

Other possible Skills include Business, Computer, Hagglng, Space Navigation, Space Pilot, Streetwise.

EQUIPMENT AND COST ▢

Typical Equipment:	Repair tools, pressure suit, primitive firearm.
Salary:	Varies. Most clans use a barter economy. Technical contracts pay 20,000 - 45,000 credits/year.
Basic Costs:	19 Character Points and 29 Skill Points

ACTION CAMPAIGN USES ◇

Nomads are tough as nails and willing to let their fists do the talking if necessary. Although they are rarely disciplined military veterans, they take the safety of their community very seriously and will readily lay down their lives for the clan. Their resourceful nature and expertise in living in low gravity can also make them very valuable in high-action scenarios.

INTRIGUE CAMPAIGN USES ◇

Political intrigue and espionage are not Nomads' stock and trade. Their political systems tend to be extremely simple and functional. The major corporations and governments which hire Nomads to do their dirty work for them, however, have more than enough lies and cover-ups to go around. Nomads can easily find themselves entwined in these webs when they are hired to prepare an asteroid for a supposedly civilian base that just happens to have docking facilities for exo-armors.

POSSIBLE VARIATIONS ◇

Clan chiefs have the lives of their community in their hands, guiding their small world toward either prosperity or doom. They are surrounded by trusted advisors (often their close relatives) who are sometimes expected to acquire uncharacteristic knowledge. Some chiefs go as far as sending their advisors to be educated in "civilized" areas and hope they will bring back valuable expertise.

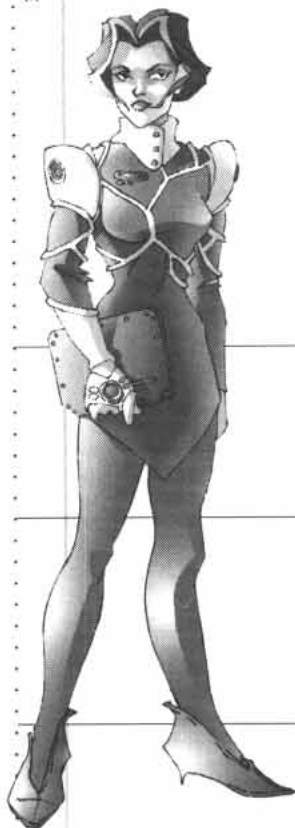
POSSIBLE SUBPLOTS ◇

Even Nomads who travel across the solar system for corporate employers will be seriously affected by goings-on in their clan's home. Political upheaval is often violent and relatives of a deposed chief may find themselves exiled from their home. Corporate or governmental attempts to manipulate or take advantage of a Nomad community can also haunt clanners.



3-5-7

3.5.8



► OFFICIAL/EXECUTIVE

As the age of isolationism came to an end, government officials and corporate executives have discovered the shuttle lifestyle. While the top leaders of the solar system usually remain on their home worlds, their delegates and ambassadors fan out across the void, operating from modified diplomatic liners.

In this time of dynamic change and increasing tensions, diplomats and business representatives are on the cutting edge of reorganizing the power structure of the solar system. Each decision contributes toward the drive for a new order or the fall toward interplanetary chaos. Many executives pay little heed to these warnings, and seek only new business opportunities for their corporate bosses. Others realize how high the stakes have become and are dedicated to protect their interests in the face of the changes to come.

Although business executives and political officials often find themselves at odds and emphasize the differences between their positions, others see them as almost interchangeable. They dress for success and speak in clean and crisp sentences (often changing smoothly from one language to the other). These elite power-brokers often look down on settlers and Nomads as barbarians and ne'er-do-wells.

■ TYPICAL ATTRIBUTES

AGI	0	APP	0	BUI	0	CRE	0	FIT	0
INF	1	KNO	1	PER	1	PSY	0	WIL	0
STR	0	HEA	0	STA	25	UD	3	AD	3

■ TYPICAL SKILLS

Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.
Bureaucracy	2	1	Etiquette	1	1	Law	1	1	Notice	1	1
Business	2	1	Human Perception	2	0	Leadership	1	1			

Other possible Skills include Computer, Foreign Language, Hagglng, History, Intimidation, Investigation, Law.

■ EQUIPMENT AND COST

Typical Equipment:	Expensive clothes, personal computer, anti-espionage devices.
Salary:	Typically 60,000/year and above (government officials), and 120,000/above (executives).
Basic Costs:	19 Character Points and 29 Skill Points.

◇ ACTION CAMPAIGN USES

Government officials and top business executives are often targets for piracy, covert operations or shows of force. As a result, they often learn to fight or surround themselves with bodyguards or skilled pilots. In an action-based campaign, executives can often provide the drive for adventure. The objectives of their corporation or government (and the agendas of their enemies) place them in dangerous situations with frightening regularity.

◇ INTRIGUE CAMPAIGN USES

Executives and officials are most at home in intrigue campaigns. They deal in secrets and understandings as their stock and trade, and almost unavoidably will become involved in corporate or political intrigues. All the major powers of the solar system have their fair share of dirty secrets, and uncovering these can easily form the core of a Jovian Chronicles campaign.

◇ POSSIBLE VARIATIONS

Corporate and governmental fiefdoms rarely forgive transgressions, and playing officials exiled from the halls of power can be an interesting variation. These pariahs may escape with very valuable information and insight about the agendas and practices of their former employers. Another option is to play a mole or spy, an official who actually reports to a foreign or competing power. The shadow world of espionage is an excellent campaign backdrop.

◇ POSSIBLE SUBPLOTS

The struggle to strike a difficult deal or arrange for an unlikely treaty can form a recurring subplot for executives and officials. This can lead to efforts to make unlikely contact with those who may sway the other negotiating party. A conflict between personal and political objectives can also be an effective subplot.

REPORTER ◀

The people's right to know and the networks' right to profits regularly send legions of reporters across the solar system in search of the next big story. The major news services maintain offices in most planetary systems, employing staffs that range from a few independent freelancers to full professional teams.

The distances (and transmission lag-time) involved in interplanetary transmission and reporting have changed the format of news coverage. Instant reports (with resulting sound-bites and five second video clips) are feasible only for local reporting. Off world correspondents use a more journalistic format, which presents a longer and more in-depth report, usually every few days.

Although some reporters are still hired only for their looks, they usually end up working only at the broadcast centers. Field correspondents are typically much more resourceful and independent, capable researchers, investigators, video technicians and authors as well as presenters. The long-term offworld assignments common to interplanetary reporting entail that few correspondents can afford to establish lasting personal relationships.

TYPICAL ATTRIBUTES ▢

AGI	0	APP	0	BUI	0	CRE	1	FIT	0
INF	1	KND	0	PER	1	PSY	0	WIL	0
STR	0	HEA	0	STA	25	UD	3	AD	3

TYPICAL SKILLS ▢

Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.
Bureaucracy	1	0	Etiquette	1	1	Interrogation	2	1	Notice	1	1
Combat Sense	1	1	Human Perception	1	0	Investigation	2	1	Streetwise	2	1
Communications	1	0									

Other possible Skills include Computer, Electronics, Foreign Language, History.

EQUIPMENT AND COST ▢

Typical Equipment:	Rugged all purpose clothing, portable audio/video equipment, personal computer.
Salary:	Beginners are usually paid 22,000/year; this increases with experience and prestige.
Basic Costs:	19 Character Points and 25 Skill Points.

ACTION CAMPAIGN USES ◇

Reporting from battle scenes is perhaps the quickest route to fame and fortune in the world of the news media. Military maneuvers, pirate raids and civil wars all make for excellent headlines. Experienced reporters learn to think on their feet and keep calm in the line of fire, so they can be a real asset in action adventures.

INTRIGUE CAMPAIGN USES ◇

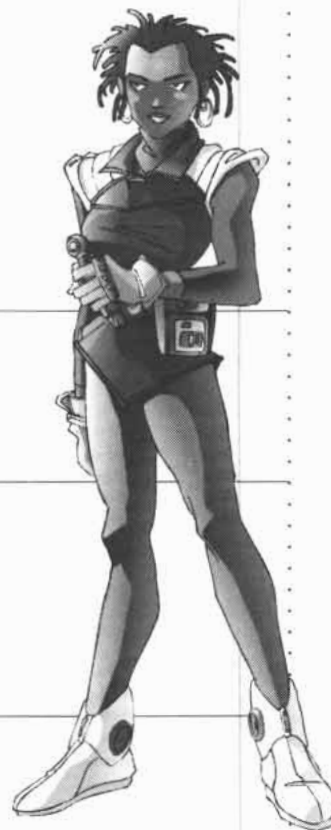
If combat reporting is the quick road to fame, the most respected is investigative journalism. Uncovering the hidden agendas of the powerful players in the solar system is the stock and trade of a whole class of reporters, and this regularly plunges them into the shadow world of political and corporate intrigues. Investigative journalists can be surprisingly resourceful, using a whole network of hidden contacts to circumvent national security agencies and "follow the money" to the highest levels of authority.

POSSIBLE VARIATIONS ◇

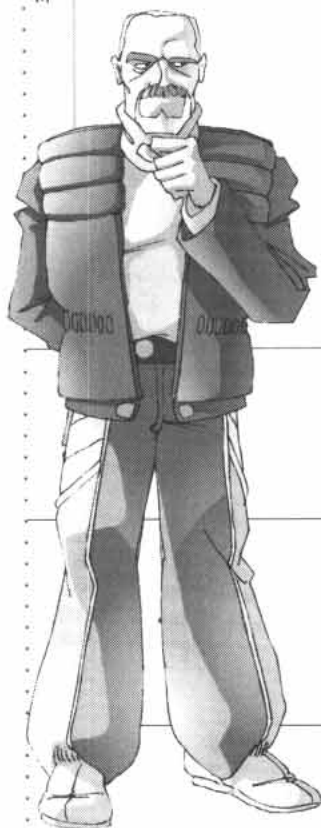
Not all journalists are the same and several other roleplaying opportunities exist beyond traditional hard-news reporters. Scandal sheets and tabloids proliferate on the vid stands of many planets and those who seek out the secrets of the rich and famous make a handsome living. Although many reporters now carry their own equipment, top teams still use camera technicians, and these hidden faces in the news-gathering process can also be interesting to roleplay.

POSSIBLE SUBPLOTS ◇

Most reporters have a pet story they pursue over long years of research. Often this has more to do with their own personal feelings than the "need to know." Such a story — perhaps a probe into the background of a politician — can form a recurring subplot over an entire campaign. The struggle to maintain personal relationship also plagues reporters.



3.5.9



► SCIENTIST

In the space stations which house much of humanity, reliance on science and technology is complete. Without the special radiation shields, power plants and recycling systems, very few humans could survive away from Mother Earth. The terraforming of Venus and Mars speak even more loudly of the prestige of scientists in the 23rd century.

Few scientists have the liberty to work on pure science, however. Even those working in academic institutions are under heavy pressure to undertake work with immediate technological applications. In the private and government sectors, the pressures to produce are even stronger. A few mild beacons of theoretical work do exist, but these programs are sidelines at best.

The militarization of science is a major preoccupation for most of the scientific community. Even in relatively open societies like the Jovian Confederation, it seems as if every scientific treatise and discovery is raided by the military for wartime applications. A growing number of scientists feel disgruntled by this appropriation of their work and talks of a peace movement are growing.

▣ TYPICAL ATTRIBUTES

AGI	-1	APP	0	BUI	-1	CRE	1	FIT	0
INF	0	KNO	2	PER	0	PSY	0	WIL	0
STR	0	HEA	0	STA	20	UD	2	AD	2

▣ TYPICAL SKILLS

Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.
Computer	1	2	Electronics	1	2	Physical Sciences	2	2	Teaching	1	1
Earth Sciences	2	2	Life Sciences	2	2						

Other possible Skills include Bureaucracy, Electronic Design, Foreign Language (Latin), History, Mechanics, Medicine, Tinker.

▣ EQUIPMENT AND COST

Typical Equipment:	Laboratory, high-powered personal workstation.
Salary:	Depends on the employer. Academic salary usually approaches 60,000-100,000 credits a year.
Basic Costs:	19 Character Points and 29 Skill Points.

◇ ACTION CAMPAIGN USES

Scientists are more comfortable in a laboratory than in the heat of action, but there are always exceptions. Most prefer to watch from a safe distance, however. This reluctance can create excellent roleplaying opportunities. Scientists who are quick on their feet may well piece together devices or improvise solutions more effective than any firearm.

◇ INTRIGUE CAMPAIGN USES

Knowledge is power. The major governments and corporations of the solar system are well aware that the end of planetary isolationism is most keenly seen in an accelerating race for new technologies. Cutting edge research is among the most valuable resources in which power-brokers deal. As such, scientist become a prime target for intrigue and covert recruitment. Those who can play the game might become magnificently wealthy. Those who cannot may vanish without a trace.

◇ POSSIBLE VARIATIONS

There are many dynamic areas of scientific and technological development in the 23rd century, each calling together special kinds of scientists and engineers. Terraforming retains prestige because of the sheer scale of operations, and attracts many to Venus and Mars to tinker with entire planets. Astrophysics, robotics, artificial intelligence and genetics are all developing fields as well, attracting young hotshots to challenge the positions of veteran thinkers.

◇ POSSIBLE SUBPLOTS

Every scientists is in search of the next frontier of discovery or application. The quest to be the first and the best consumes many and can run through an entire campaign. Rivalries between scientists are common despite empty talk of academic cooperation. The appearance of a sworn enemy on the scene can turn a scientific team's life into turmoil.

SOLDIER/SECURITY OFFICER ◀

Despite doe-eyed predictions of a utopian life among the planets of the solar system, the 23rd century is not a time of universal peace and justice. Skirmishes constantly crop up along the border of warring nations, corporate arcologies are closed against the poor and the opportunistic, and fanatical terrorists seem ready to take innocent lives at every turn. In a world such as this, soldiers, police officers and private security guards are an all-too-common sight.

Soldiers are drawn from every aspect of society, from elite officers of the CEGA Naval Forces to the common grunts of the Martian Federal Army. Soldiers of the 23rd century are trained to be quite independent because of the massive distances involved in interplanetary (or even planet-wide) operations. In most armies, command decisions often leave much room for soldiers' own initiative.

Civilian security officers operate much as they have for hundreds of years, often based in precincts and squads assigned to specific regions or crimes. Smaller stations tend to have marshals or sheriffs who oversee all law enforcement from major crimes to traffic violations.

TYPICAL ATTRIBUTES ▢

AGI	0	APP	0	BUI	1	CRE	0	FIT	1
INF	0	KNW	0	PER	1	PSY	0	WIL	0
STR	1	HEA	0	STA	30	UD	7	AD	6

TYPICAL SKILLS ▢

Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.
Athletics	1	1	Hand-to-Hand	2	0	Investigation	1	1	Security	2	0
Combat Sense	1	1	Interrogation	1	0	Melee	1	0	Small Arms	2	0
Dodge	1	0	Intimidate	1	1	Notice	2	1	Streetwise	1	0

Other possible Skills include Camouflage, Exo-Pilot, First Aid, Law, Navigation, Survival, Zero-G (both).

EQUIPMENT AND COST ▢

Typical Equipment:	Sidearm, uniform, patrol vehicle, personal comm gear, flashlight, restraints (security officer); Fatigues, rifle, hand grenades, personal medical kit. (soldier)
Salary:	Varies from 17,000 to 40,000 credits a year.
Basic Costs:	19 Character Points, 29 Skill Points.

ACTION CAMPAIGN USES ◇

Soldiers and police officers are among the building blocks of action adventure campaigns. Whether special forces soldiers or corporate security guards, they have the skills and resources to fight in whatever battles are to come. Soldiers or officers trained in secondary skills such as investigation or scouting can be even more interesting in these situations because they permit a mix of action and subtlety.

INTRIGUE CAMPAIGN USES ◇

Although action is the bread and butter of the soldier and security officer, intrigue campaigns can feature them as well. Police officers and special forces are trained to investigate and can stumble into unusual situations. Special forces soldiers often participate in covert operations and may find themselves cut off by a black operation gone wrong.

POSSIBLE VARIATIONS ◇

Less concerned with national objectives and legalities, corporate security officers are trained only to defend the interests of their employer. This same dynamic is even purer in the case of bodyguards, who dedicate themselves as human shields and security experts for their charges. Small time police officers, from Nomad sheriffs to beat officers on Earth, can also be interesting to roleplay as they are exposed to the world beyond their limited horizons.

POSSIBLE SUBPLOTS ◇

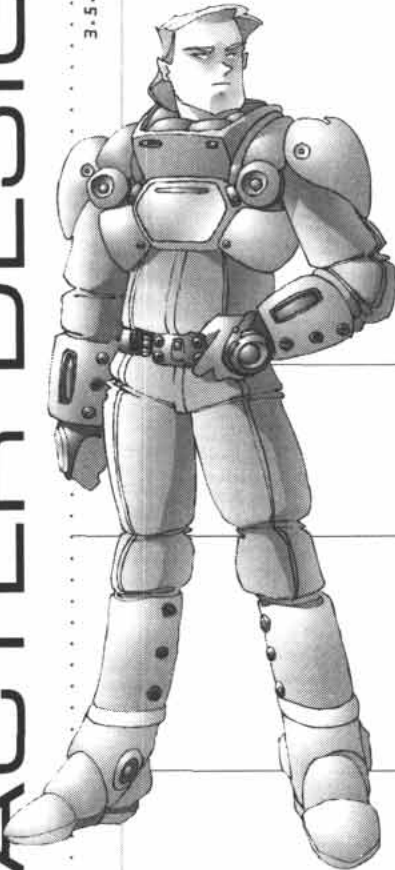
Soldiers, police officers and security agents are expected to draw a very clear line between themselves and their opponents (be it enemy soldiers or various types of criminals). Many, however, find themselves feeling empathy toward the other side, usually reinforced by a personal connection to an enemy or criminal.

E.S. 11





3.5.12



► SPACEFIGHTER PILOT

Although not as glamorous as the elite exo-armor pilots, the fighter jocks who pilot fighter air- and space-craft are a well-respected and daring lot. In planetary combat, air fighters still reign supreme because of exo-armors' lack of lift. In space combat, exos are more versatile. Pilots of space fighters swear by their craft, however, and refuse to bow before the far more expensive exos. In order to compensate for the exo's capabilities, pilots of space fighters have become inveterate hot shots, breaking into daring maneuvers with very little provocation.

Many fighter pilots are failed exo-pilots and hold significant resentment toward the elite corps which excluded them. When off duty, they go out of their way to provoke exo-pilots. Military planners, especially in the JAF, have learned not to place space-fighter pilots and exo-pilots together in close quarters.

Despite these discipline problems, the fighter pilot corps of most armed forces have a very powerful sense of *esprit de corps*. Their very resentment for the more glamorous exo-pilots bonds fighter jocks together, making them one of the most tight-knit corps in most armed forces.

▣ TYPICAL ATTRIBUTES

AGI	1	APP	0	BUI	0	CRE	0	FIT	1
INF	0	KNO	0	PER	1	PSY	0	WIL	0
STR	0	HEA	0	STA	25	UD	3	AD	3

▣ TYPICAL SKILLS

Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.
Aircraft Pilot	1	1	Electronic Warfare	1	0	Navigation (Space)	1	0	Space Pilot	2	0
Combat Sense	1	1	Gunnery (Space)	2	1	Small Arms	1	1	Zero-G Movement	1	1
Communications	1	0									

Other possible Skills include Gunnery (Aircraft), Hand-to-Hand, Leadership, Navigation (Air), Survival, Zero-G Combat.

▣ EQUIPMENT AND COST

Typical Equipment:	Flight suit, sidearm, survival gear.
Salary:	Ranges from 35,000 to 55,000.
Basic Costs:	19 Character Points and 27 Skill Points.

◇ ACTION CAMPAIGN USES

Another staple of the action campaign, fighter pilots are very capable in a space or air battle. Deployed as part of mixed military forces, they can easily fly side by side with exo-pilots, although neither will like it very much. Pirates and smugglers make more use of spacefighters than exos because it is easier to get both the original vehicle and spare parts.

◇ INTRIGUE CAMPAIGN USES

Fighter pilots will likely become involved in intrigue campaigns despite themselves. Not prone to sophisticated political thinking, they can nonetheless be drawn into a web of lies and secrecy. Participating in a secret military operation, witnessing the use of a new prototype, or raiding a corporate (or diplomatic) vessel can all lead straight into a series of intrigue-based adventures.

◇ POSSIBLE VARIATIONS

Perhaps the most glamorous of fighter pilots are test pilots. These intrepid souls risk their lives to push the envelope one step further. Although exo test pilots do exist, they are rare. The military often prefers to entrust new designs to experienced and multi-talented pilots drawn originally from the fighter corps. This point of pride is rarely left unsaid when fighter jocks and exo-pilots meet.

◇ POSSIBLE SUBPLOTS

Rivalry with an enemy pilot is always a possibility, especially when rival forces are placed in a cold war situation (such as along the Martian border). The struggle to have a normal family life in an occupation that often involves months (or even years) on maneuvers throughout the solar system is another common subplot for fighter pilots.

TECHNICIAN ◀

In the high-tech world of Jovian Chronicles, few can afford to live any great distance from skilled technicians. Sealed environments such as O'Neill cylinders or Jovian stations would not last long without the massive engineering and repair crews that keep them functional. Huge spacecraft and sleek exo-armors are worth nothing to the military if they are constantly awaiting repairs.

Technical and engineering careers are among the most popular in the orbital stations, the nomad asteroids and the Jovian Confederation, where there is an acute appreciation of skilled technical knowledge and a desire to help the community by contributing to the field. Technicians tend to be dynamic and friendly, always ready to try something new or lend a helping hand. Only those who disparage the accomplishment of planetary settlements can expect poor treatment from the average technician.

The combination of social prestige and friendly reputation makes the stereotypical technician into a fatherly figure. Respected by the community around him, he offers wisdom and "paternal" commentary as he goes through life. This stereotype often seems to carry over to military techs.

TYPICAL ATTRIBUTES ▢

AGI	0	APP	0	BUI	0	CRE	2	FIT	0
INF	0	KND	1	PER	1	PSY	0	WIL	0
STR	0	HEA	0	STA	25	UD	3	AD	3

TYPICAL SKILLS ▢

Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.	Skill	Level	Attr.
Communications	1	1	Electronics	2	1	Mechanics	1	1	Tinker	2	1
Computer	2	1	Electronic Design	1	1	Physical Sciences	1	1			

Other possible Skills include Business, Electronic Warfare, Haggling, Mechanical Design.

EQUIPMENT AND COST ▢

Typical Equipment:	Extensive tool kit, portable computer with design specs, work suit, pressure suit.
Salary:	Varies from 20,000 to 100,000 credits a year.
Basic Costs:	19 Character Points and 28 Skill Points

ACTION CAMPAIGN USES ◇

Any campaign that features a vessel, exo-armors, a space station or any high-technology features greatly benefits from a technician or engineer. Nothing is quite so painful as a critical equipment failure when the only chances of repair are 10,000 kilometers away. Technicians can also modify equipment and tinker together more than one solution to most problems.

INTRIGUE CAMPAIGN USES ◇

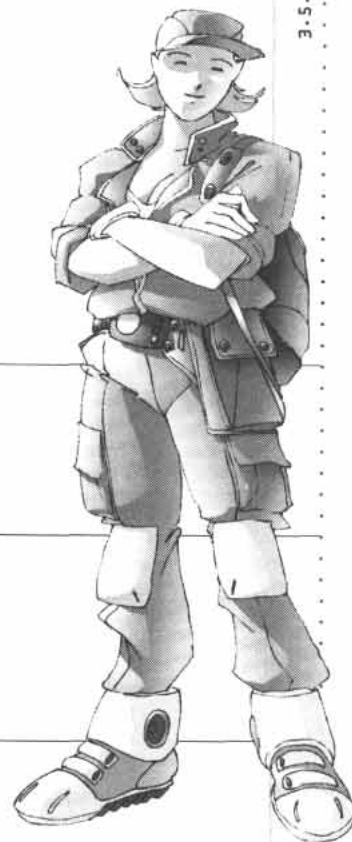
Technology is one of the main weapons of espionage and intrigue. From tailored computer viruses to high-microscopic listening devices, the technical resources of the major powers are immense. Those who wish to play in the shadow world had best be prepared to fight fire with fire.

POSSIBLE VARIATIONS ◇

Different types of technicians lend themselves to different types of adventures. Computer techs can access the world of computer hacking and information alteration, to become "virtual" spies. Weapons technicians live and breathe in the world of combat, guiding their pet arms to their targets. Engineers and technical designers do more than supervise and utilize technology, they create new configurations and uses, and share much in common with scientists.

POSSIBLE SUBPLOTS ◇

Especially in the military the major constraint on a technician's accomplishment is his access to resources rather than his skill level. The struggle to obtain needed resources and the ensuing battles with bureaucracy and high-command can make for an interesting recurring subplot. The introduction of a new technology, the appearance of a dangerous hacker, or the discovery of a dangerous piece of equipment can also serve as background for Jovian Chronicles stories.



3-5-13

end of section 1.1 career packages

► MILITARY FORCES OF THE SOLAR SYSTEM

While Humanity may have transcended the boundaries of Earth's orbit, the ugly specter of war still remains. Even though the solar nations were reunited under peaceful circumstances, the first action of many governments was to increase military production and recruitment. The peaceful and secluded Jovians were so well suited to the science of warfare that they created the *exo-armor*, arguably one of the deadliest and most terrifying war machines ever fashioned. Of course, the other solar nations were quick to imitate them, and the last decades have witnessed a remarkable arms race taking place in the absence of war or even the threat thereof. Exo-weapon technology is now used by every major nation in the solar system. Even CEGA (which is often blamed as the source of the current frenzy of military buildup) is beginning to shift its considerable resources away from its traditional focus on warship construction in order to keep up technologically with its rivals.

The armies raised by the solar nations vary greatly in their purpose, appearance and equipment. Some, like the Venesian Home Defense Force, are elite troops charged with protecting their planet. Others seem to be best suited to invasion and conquest, like the massive armadas of CEGA and the Jovian Confederation. All share an integrated structure that features lots of organic support, a requirement for the highly technological modern armies.

The one common element in these armed forces is the loose command structure. Even the Martian Federated Army (considered rigid by twenty-third century standards) is flexible in comparison with armies of the past centuries. This doctrine springs from a need for every soldier to be able and willing to make important judgments without aid from superiors; on a battlefield where the nearest friendly human may be thousands of kilometers away, the individual soldier's initiative is far more valuable than the presence of an organized hierarchical structure. Standard units which remain in constant communication with their headquarters may follow a more strict doctrine and their loyalty may not be as important, but for those individuals who may pilot multi-million credit vehicles into deep space, flexibility and initiative are of the utmost importance, and their loyalty must be unswerving. It comes as no surprise that space navy pilots go through a tight battery of psychological tests before being accepted.

▼ DAY-TO-DAY LIFE

A soldier from a famous army of the past would be horrified to see the relaxed attitude of his modern counterpart. While discipline remains at the core of military life, the modern trooper and pilot are allowed much more leeway in their behavior. Combat groups tend to be smaller and command chains shorter, both leading to an increased level of fraternization between the ranks.

The presence of women in many front line units have wrought even deeper changes in the military structure. Though there have been women warriors in the past, it is unprecedented that some of the modern armies are composed of up to one-third female personnel, in frontline units as well as support positions.

Despite military discipline, human behavior does not change much. Rather than trying to cover it up, like it has done many times in the past, the modern army now accept that there will be the occasional case of "high-level fraternization," or couples falling in love. As long as it does not impair combat operations, such relationships are tolerated. Officers will keep a close eye, though, and any drop in performance, or any disruption of the unit's operations will result in reprimands and reassignment.

One element from military life which has not changed, however, is that of bonding between members of a unit. Through their trials and tribulations, soldiers who go through difficult ordeals form unique ties between each other, and this is something that is encouraged by officers. The best units on the battlefield (or in space) are those composed of soldiers and pilots who care about each other, and will watch each other's back. To that effect, officers in all branches of all armies still encourage a "us-against-them" attitude in enlisted personnel, just to provide their soldiers with extra motivation to stick together. Whenever one man falls, everyone must pick him up — they know he would do the same if the roles were reversed. Whenever one man makes trouble, the whole unit suffers the punishment, not just the individual who caused the problem. It will be the responsibility of the members of his unit to find out who messed up (if no one admitted to it) and to inflict the appropriate punishment if and when the culprit is discovered.

This attitude also extends to the relations between the branches: the space navy mocks the infantry, the air force makes fun of artillery, etc. This rivalry between branches implies that their respective members must back each other in the face of others, an attitude which displays their loyalty to their own group. It is important for everyone to know these ties exist so that in the thick of battle, they know they can count on their teammates.

This strong sense of belonging is extremely rare among civilians. It is perhaps one of the most important motivations behind a soldier's enlistment — after all, not all military people are bloodthirsty killers. Some just do it because they need to belong somewhere.

SAMPLE DECORATIONS ▼

Decorations, medals and other insignias of valor have been a part of military traditions for millenia. The various armed forces that serve and protect the settlements of the solar system each have their own way of honoring the deeds and actions of their members.

2-4 E

HDF: PEGASUS SUN ◇

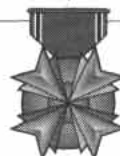
Also known as *Taiyo no Medaru* (the Sun's Award), the Pegasus Sun is the HDF's highest public honor. Desired by many young HDF soldiers because of its prestige, the award is silently disdained by older troops who know that it is a meaningless one. The *real* honors of the HDF are a closely kept secret.



CEGA: CROSS OF ST. GEORGE ◇

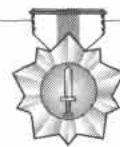
The Cross of St. George is an honor bestowed upon CEGA soldiers who have faced immense odds and emerged victorious. Among the public, it has earned the unofficial title of "The Cross of Heroes."

The Cross' name is a reference to the old European story of St. George's battle with a dragon. Recipients of the award have formed an unofficial secret society called "The Dragon Hunters." Although most soldiers who earn a Cross are seasoned veterans, an increasing number of hotshot young exo-armor and fighter pilots in the CEGA military has brought some new blood into the Dragon Hunters.



FRR: STAR OF VALOR ◇

This award is given to Free Republic Rangers who perform heroic deeds while under heavy fire or other adverse conditions. It is one of the highest honors in the Republic, and its bearers are often promoted more quickly than their peers who have not earned the award.



FRR: STARBURST ◇

This medal is awarded to Rangers who have served for five years. The medal is upgraded every five years after it is first granted. Since the standard Ranger tour of duty is ten years, many Rangers have one or more upgrades. Officers who do not yet have their Starburst must be very good indeed to have achieved such rank so quickly.



MFA: DEIMOS CROSS ◇

The Deimos Cross is a career-boosting award to denote valor and honor. Free Republic citizens are quick to point out the Greek origins of the medal's name. They refer to it as the "Cross of Terror," noting that most of these medals are given out after riot control and other civil insurgency suppressions.



MFA: DEIMOS CROSS WITH BARS ◇

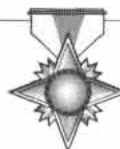
Where the Deimos Cross is little more than a pretty bauble, the Deimos Cross with Bars is a difficult-to-earn medal of valor. Its recipients must not only demonstrate extraordinary bravery and skill, but must also be model officers with spotless records. This award is highly sought after but seldom achieved; most soldiers are disqualified after their first post-bootcamp drinking binge.



JAF: GOLDEN NOVA ◇

The Golden Nova is awarded to JAF personnel for actions above and beyond the call of duty. Since technicians and other support crew are eligible for this honor, the Golden Nova can be found almost everywhere in the JAF.

Many Golden Novas were awarded in the wake of the Battle of Elysée. Most of these went to pilots who defended the capital during the battle and technicians who braved enemy fire while repairing the sabotage enemy commandos had wreaked upon the station.



JAF: GOLDEN NOVA WITH THUNDERBOLTS ◇

This medal is awarded to soldiers who, in addition to meeting the requirements for the Golden Nova, also prove willing to sacrifice themselves to save the lives of others. It has been awarded only sixteen times since its creation in 2171.

Two of the five people who received this award after the Battle of Elysée are worthy of mention. Lieutenant Carl DeMers endured fatal radiation poisoning and g-forces in order to warn Jovian forces of the attack on the capital, while Lieutenant Madeleine Koudriopoulos was instrumental in defending Elysée from the CEGA fleet (although her use of the nearly invulnerable *Prometheus* prototype in the incident has prompted many to regard her award as nothing more than a morale boost for the general populace).



E.P.E



▼ JOVIAN ARMED FORCES

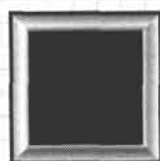
The Jovian Armed Forces are composed entirely of volunteers, a remarkable feat for such a large army. This is attributable to the high patriotism of the average Jovian citizen coupled with the JAF's skilled public relations officers. CEGA, lacking both these qualities, often resorts to compulsory service in order to fill its ranks.

The military is an integral part of Jovian society. Soldiers are permitted great freedom in choosing outside work and the length and time distribution of their tour of duty, making military service a popular choice for young Jovians. The resulting financial aid and the fact that Jovian companies show a preference for applicants with military service also help to increase the pool of applicants for the JAF. Nearly half of all secondary school graduates in the Confederation apply for acceptance into the JAF. Although pacifists in the Confederation regularly protest this heavy focus on military service, they can offer no alternative that will draw so many of the Confederation's best and brightest minds. That such a military is necessary is unarguable, especially in the wake of the Battle of Elysée, which might well have been lost if the Jovian forces had not taken such quick and appropriate action.

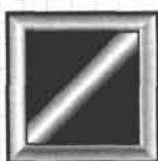
The preliminary screening process for the JAF is a grueling test of determination and courage that few of the thousands of annual applicants pass. Those who do manage to be recruited are sent to training camps. Recruits who show exceptional promise are earmarked for Officer Training School, which they attend concurrently with the standard training scheme. Officers take much longer to finish their military education, but end up being a much tougher bunch. Once a soldier's basic training is complete, he or she is assigned to one of the three sub-armies of the JAF. Further training takes place there, since all JAF personnel are cross-trained to some extent to increase their flexibility.

Each sub-army is divided into battlegroups of warships and squadrons of auxiliary craft. The organization of squadrons varies, since the Jovians freely mix exo-armors, conventional spacefighters and exo-suits for increased flexibility. Squadrons are divided into flights of two to ten units. Battlegroups are organized around carriers. Smaller ships are frequently transferred between battlegroups, but stay with their original Division until they are decommissioned or destroyed.

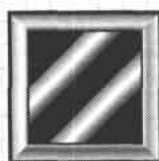
▣ JOVIAN ARMED FORCES RANKS



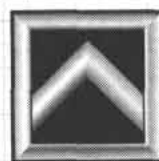
E1: Recruit



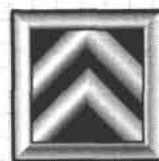
E2: Private



E3: Corporal



E4: Sergeant



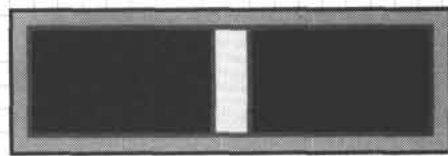
E5: Master Sergeant



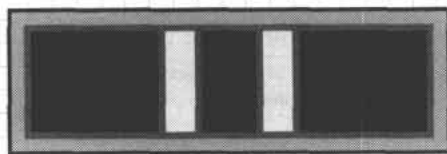
W1: Warrant Officer



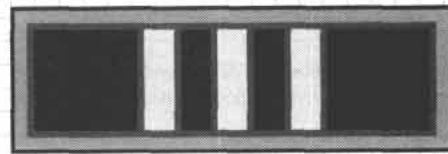
W2: Chief Warrant Officer



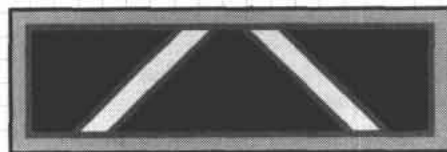
O1: Lieutenant



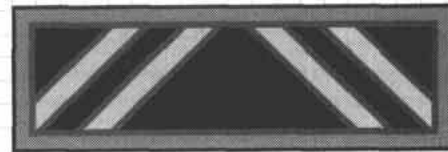
O2: Captain



O3: Commander



O4: Colonel



O5: General

VENUSIAN HOME DEFENSE FORCE (HDF) ▼

The Venusian military was created by several large Japanese corporations which needed a small security force to patrol their new planet and the surrounding space. The new Home Defense Force was structured much like the Japanese military back on Earth, with the same ranks and language.

Although Venusian culture is no longer dominated by Japanese traditions, nobody saw any good reason to change a perfectly good military organization. The modern Venusian Home Defense Force retains its Japanese flavor, and includes the Japanese ranks and adherence to many honor-related traditions.

Although the HDF is rather small compared to the CEGA or Jovian militaries, it is still a force to be reckoned with. Its troops are very highly trained, and the quality of their equipment is top-notch. Exo-weapon technology is widely used. Several corporations have spent a great deal of money to ensure that Venusian exo-armors are far superior to anything else in the solar system. The true capabilities of Venusian exo-armors are unknown, however, as is the true size of the HDF itself, since the Venusians refuse to allow anyone more than a cursory view of their military.

The standard organization of the Home Defense Force is centered around the Flight, which is composed of four machines of the same type. These can be exo-technology vehicles, conventional spacefighters or armored vehicles (although there are very few of these). Squadrons are made up of three Flights, each commanded by a Tai-I. Squadrons are assigned to a ship or base, and are commanded by Tai-sa. Infantry are often equipped with exo-suits, and are grouped into squads of eight and platoons of twenty-four.



3.6.4

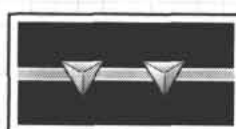
VENUSIAN HOME DEFENSE FORCE RANKS ■



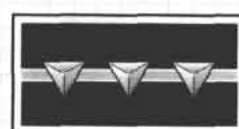
E1: Nito-Hei



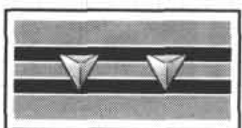
E2: Heisei



E3: Jotto-Hei



E4: Go-Cho



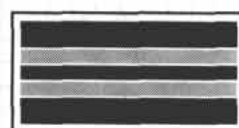
E5: Gunso



E6: Shujin



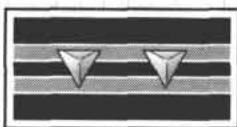
E7: Socho



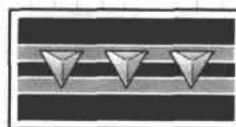
W1: Jun-I



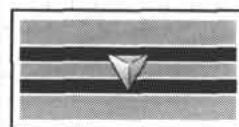
O1: Sho-I



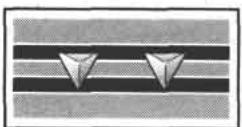
O2: Chu-I



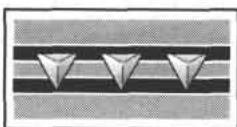
O3: Tai-I



O4: Sho-Sa



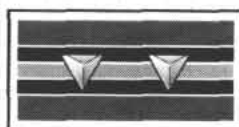
O5: Chu-Sa



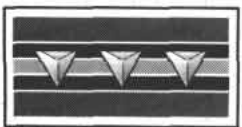
O6: Tai-Sa



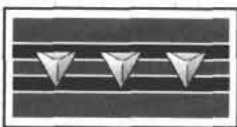
O7: Cho-Sho



O8: Sho-Sho



O9: Chu-Jo



O10: Tai-Sho



▼ CEGA NAVAL FORCES

The Navy is the more powerful of the two parts of CEGA's military forces, both politically and technologically. The Navy has Council-granted priority over the Army, which allows it to requisition any personnel or equipment from the Army without explanation and with very little advance notice. This power is used mostly by obnoxious Navy officers who wish to express their contempt for the "mudkissers," since the Navy is well funded enough to recruit its own personnel and buy whatever equipment it needs.

The Navy's organization is centered around its vessels, since it is meant to be a solar system-wide mobile battle force, although spacefighters and exo-armors also play a major part in the Navy's Table of Organization and Equipment (TO&E). It is divided into six fleets, each of which is independent of the others, with its own support division and administration. Each fleet is commanded by an admiral who directs operations from a *Poseidon*-class battleship-carrier.

Fleets One through Three are escort fleets, with a large complement of fast frigates, destroyers and light carriers. They patrol international space to maintain a visible CEGA presence in the solar system. The remaining three fleets are the main warfleets, to which the Navy's battle carriers and assault ships are assigned. Fleets Four through Six have been assigned to the Earth system since their creation, and are the subject of much foreign observation. Each fleet is home to an ever-increasing number of fighter and exo-armor squadrons, a sign that the Navy is shifting focus away from planetary bombardment and toward neutralization of specific enemy resources. Squadrons are divided into Wings, which are made up of Flights of four to six vehicles.

□ CEGA NAVAL FORCES RANKS



E1: Recruit



E2: Shipman Apprentice



E3: Shipman



E4: Petty Officer



E5: Chief Petty Officer



E6: Senior CPO



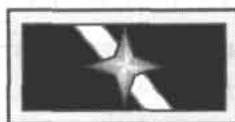
E7: Master CPO



E8: Adjutant



W1: Warrant Officer



W2: Warrant Officer 1st Class



W3: Senior Warrant Officer



W4: Chief Warrant Officer



O1: Ensign



O2: Junior Lt.



O3: Lieutenant



O4: Lt. Commander



O5: Captain



O6: Commodore



O7: Rear Admiral



O8: Vice Admiral



O9: Admiral

CEGA ARMY ▼



P.P.E

CEGA's Army is the part of the military charged with maintaining peace on Earth (and, should the occasion arise, other planets). It is centered around the regiment, each of which is commanded by a colonel. The base unit of the regiment is the platoon, which always contains units of the same type in order to facilitate maintenance and resupply. Four vehicles or approximately thirty-two men make up a platoon.

The CEGA Air Force and "wet" Navy are branches of the Army. Organization in these two branches somewhat differs from that of the main Army, but is, like the Army's, descended from twentieth-century Euro-American military doctrine. Squadrons are used in the Air Force, while the wet Navy is divided into carrier battlegroups and task forces. The availability of orbital surveillance assets and fast deployment sub-orbital transports have greatly reduced the usefulness of the wet Navy, leaving it to perform mostly logistic support and minor peacekeeping operations.

Because of the Army's paucity of funding, and the Earth's incomparably varied terrain, the Army makes use of outdated equipment that it would rather scrap. New vehicles using exo-technology are added to the conventional aircraft, ground vehicles and naval vessels which were the Army's staples at its time of creation. Almost all of the Army's exo-armors are modified versions of the Navy's Wyvern, but the CEGA Council has recently approved the development of smaller, more agile models for use only on Earth. This decision is in response to the Council's unwillingness to use orbital bombardment to coerce the Independent States to join CEGA, leaving the Army to find a less environmentally damaging (but equally grandiose) method of subduing the states.

CEGA ARMY RANKS □



E1: Soldier



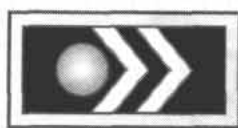
E2: Lance Corporal



E3: Corporal



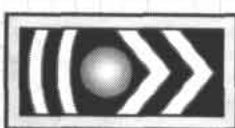
E4: Sergeant



E5: Staff Sergeant



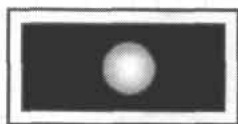
E6: Gunnery Sergeant



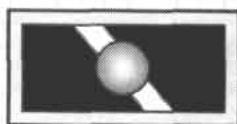
E7: Master Sergeant



E8: Sergeant Major



W1: Warrant Officer



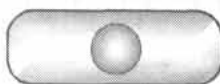
W2: Warrant Officer 1st Class



W3: Senior Warrant Officer



W4: Chief Warrant Officer



O1: Pilot



O2: Lieutenant



O3: Commander



O4: Major



O5: Lt. Colonel



O6: Colonel



O7: Brigadier General



O8: Major General



O9: Lt. General



▼ MARTIAN FREE REPUBLIC RANGERS

Due to the Free Republic's small population and the enormous amount of territory its military is expected to defend, the Rangers are smaller, better trained and more loosely organized than any other army in the solar system. Mobility and stealth are most important to the Rangers, so their use of small exo-suits and fast ground-effect hovertanks is quite extensive (although their token space force does use exo-armors). Their overall approach to strategy heavily emphasizes hit-and-run tactics and guerrilla-style warfare. In the face of the *Martian Federated Army's* superior manpower and equipment, the Rangers must plan to hit the enemy below the belt, or risk not living long enough to hit at all.

Training is, by necessity, of the "get down and dirty" philosophy, by which new recruits are taught their trade in the field. The Rangers care little for parade maneuvers and spit-and-polish, so boot camp is purely a combat-training experience. Training is often multidisciplinary and spread out over several years; the average tour of duty for a Ranger is ten years (about five Martian years).

Grueling exams are given every few months, testing everything from cryptography to emergency survival in the deep desert. There is very little idle time for Rangers; any spare time is expected to be spent training. This brutal lifestyle is vital to the security of the Republic, since every Republic soldier must be worth ten Federation soldiers on the battlefield.

Personnel with the ranks O1 through O3 are rarely referred to by their actual ranks. They prefer to use the "Marshal" rank instead, so that enemies will not know the actual rank of the officer they are addressing. Because of this, the Marshals are the most publicly recognized figures in the Rangers. They often serve as garrison commanders. Their large numbers are accounted for by all the higher ranks which also refer to themselves as Marshals, a convention that confuses everyone but the officers themselves.

There are only seven colonels in the Free Republic Rangers. They are the highest-ranking officers in the Rangers, reporting directly to the Secretary of Defense. Each colonel commands a Division of Rangers and can operate independently of the others, ensuring maximum flexibility. All seven are seasoned troops who regularly spend time in the field alongside their fellow soldiers. One of the colonels is in charge of the space-based forces, while the rest direct operations on Mars' surface.

▣ MARTIAN FREE REPUBLIC RANGERS RANKS



E1: Home Guard



E2: Deputy Sheriff



E3: Sheriff



E4: Deputy Marshal



E5: Marshal



O1: Ranger



O2: Dragoon



O3: Dragoon Captain



O4: Colonel

MARTIAN FEDERAL ARMY ▼



True to the government Otto Kurtz helped create, the Federated Army is very structured and disciplined. Ranks are extremely important and the chain of command is absolutely respected, both in peace time and on the field. This blind adherence to outdated tradition is paid for in flexibility on the modern battlefield; Free Republic forces often run circles around Federated Army troops that are waiting for orders.

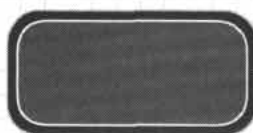
General Kurtz' German heritage shows through in the structure of his Army. The ranks and terminology are all from the German army of twenty-first-century Earth. The orderliness imposed by the structure is well in keeping with the continued rigidity of Federation society and is happily accepted by Kurtz' successors.

The Army is based on a basic five-man unit called a grupen, which is commanded by a Gefreiter or an Unterofficer. Five grupen form an Obergruppen, under the command of an Oberfeldwebel. He is assisted by an Hauptfeldwebel for both administrative and command duties. The Hauptfeldwebel is the rough equivalent of a Sergeant in the United States Army of the twentieth century. Tough and hardened by years of grunt combat, they often serve as drill officers at Army training camps. They are career noncommissioned officers who are feared and respected by the trainees they command. On the battlefield, higher-ranking officers have been known to defer (unofficially, of course) to a Hauptfeldwebel's experience and combat savvy.

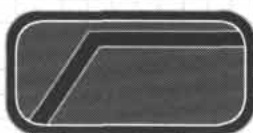
Exo-armors and other vehicles are also assigned to grupen, although they are then commanded by an Oberleutnant. Each grupen is assigned a unit number that does not change throughout its existence. The prefix "Sturm" (for exo-armors), "Blitz" (for conventional and aerospace fighters) or "Panzer" (for armored ground vehicles) is added after the unit's number for a more exact description. For example, the 23rd Sturm Grupen is an exo-armor unit. The Federation small space navy is a separate entity from the Army.

Grupen are normally assigned to a garrison pool, were stationed at one of the major Federation bases or settlements. They are reassigned to combat divisions as needed for the duration of a campaign. This fluid structure somewhat compensates for the rigid hierarchy of the army. Each grupen has its own symbol, worn by all its members and painted on all its vehicles. The soldiers take great pride in the appearance and reputation of their grupen. To help boost morale, minor cosmetic changes to the paint scheme of a grupen's vehicles (like the addition of eyes or shark jaws) are permitted. This provides a creative outlet for the otherwise repressed Federation soldiery.

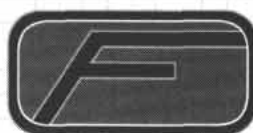
MARTIAN FEDERAL ARMY RANKS □



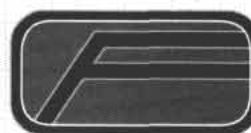
E1: Soldat



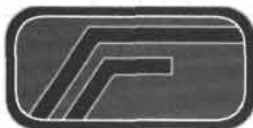
E2: Gefreiter



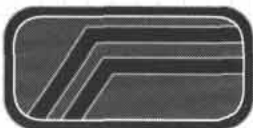
E3: Unterofficer



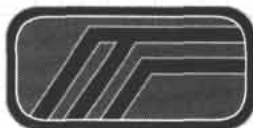
E4: Feldwebel



E5: Oberfeldwebel



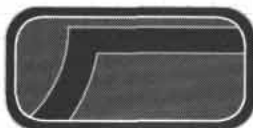
E6: Stabsfeldwebel



E7: Hauptfeldwebel



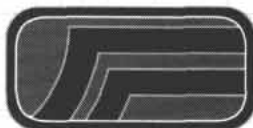
O1: Leutnant



O2: Oberleutnant



O3: Hauptmann



O4: Major



O5: Oberleutnant



O6: Oberst

THE SOLAR NATIONS



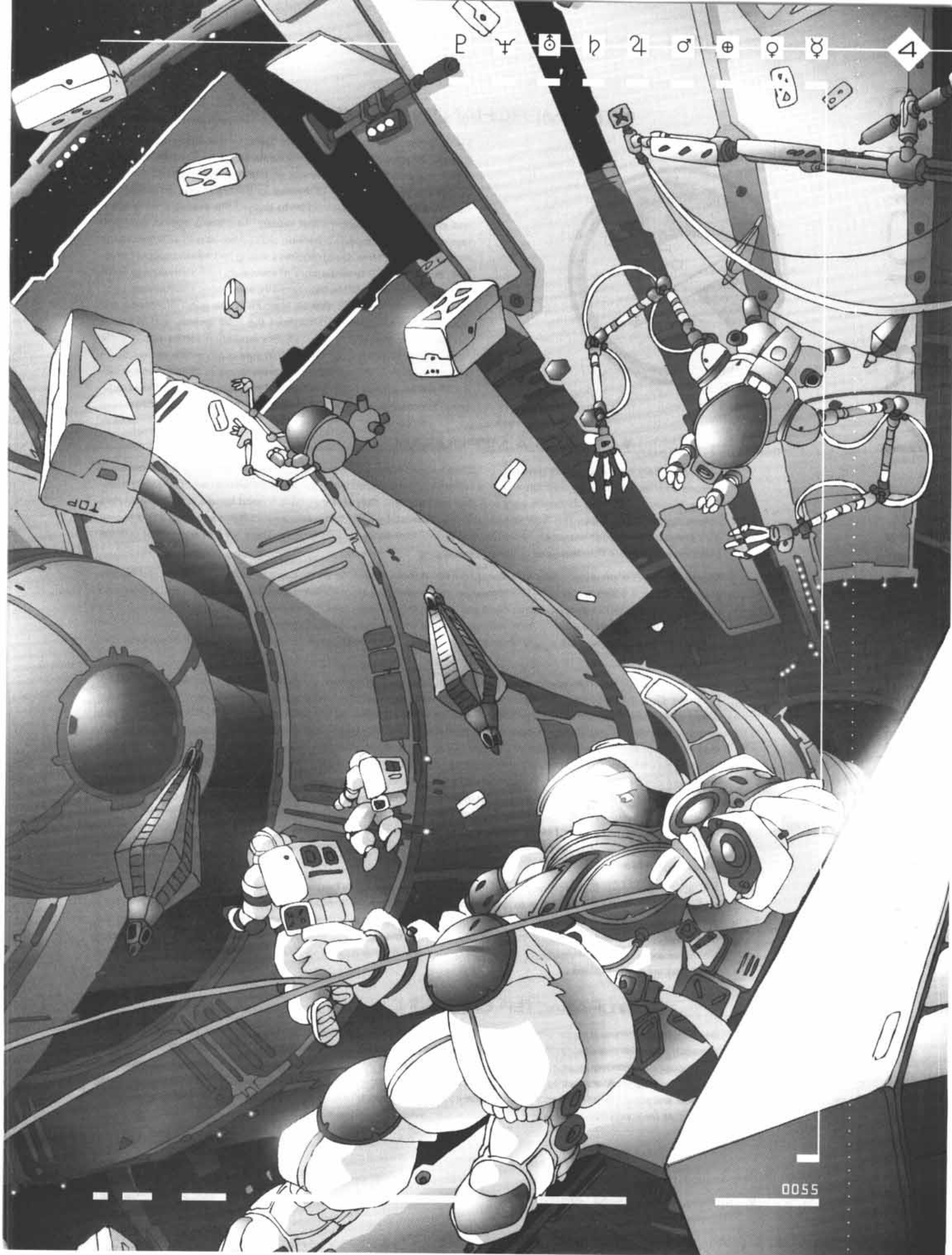
► A GRAND TOUR

The Solar System of the year 2210 teems with human life. Countless orbits are filled with the fragile pressurized islands and vessels of Mankind, bright lights in the dark sea of solar space. Just as it has done for countless millennia, Mankind has readily adapted to its environment, developing new attitudes and traditions to cope with the peculiar demands and restrictions of life on an interplanetary scale.

Though the laws of physic ensure that all space-based societies share some basic rules and customs based on survival in space, they have nonetheless evolved into distinct cultures that are as vibrant and vivid as any civilization on the Old Earth. It is impossible to describe the various local subtleties of each culture in so short a space, however, and thus the major distinctions have been summarized into a main national stereotype for each society. Though not entirely accurate (there certainly are Venusians that care nothing for their employers, or quasi-illiterate Jovians), these descriptions should help both Players and Gamemasters define the personalities and cultural background of their characters.

This chapter also includes a spectacular series of color plates that showcase some aspect of life at each of the main settlements. Two typical inhabitants are shown, giving an idea of the style of clothing worn on the Moon, in the Jovian stations and elsewhere, along with the environment they live in.

Finally, the chapter concludes with a brief overview of the relations between the people of the various human settlements. Not all is well between the factions that composed Mankind, and trouble is never far away if you start looking too close...





► THE MERCHANTS OF MERCURY



Mercury has once been called the "Land of the Nomadic Merchant Princes," an amusing if somewhat inaccurate nickname. Contrary to popular belief, the entire population is not engaged in trade-related activities, though it is the major source of revenue for the tiny Mercurian state. Many people work in space construction to expand the available living space and ensure that the systems that protect the citizens against the harsh rays of the Sun are in perfect working order. Also, as with all large organizations, the Merchants' Guild requires a strong and reliable support structure, and employs a great number of specialists from such diverse fields as engineering, psychology, bio-chemistry, astronomy, entertainment, etc. Despite all this, the myth that all Mercurians are good merchants and space adventurers persists throughout the solar system, and everyone has learned to live with it. After all, this reputation carries with it some advantages, not the least of which is that aura of adventure and exoticism which members of the opposite sex always found so attractive in the sailors of old. Merchants really don't mind. Most solar citizens find that reputation fascinating, and that gives Mercurians better sales openings.

▼ MEETING A MERCURIAN

Most Mercurians businessmen are generally outgoing and will not shy from talking to strangers. This is a good salesperson attitude and has undoubtedly contributed to the system-wide impression that Mercurians are smooth talkers. Among themselves, however, they tend to remain wary and alert until the time they feel they have a good handle on the newcomer's personality and motivations. This is an attitude strongly enforced by individual corporations which try to keep an edge over their competitors through extremely restrictive and severe non-disclosure agreements. There are few crimes that outrage Mercury citizens more than industrial or commercial spying.

Mercurians frown upon unnecessary risks, but quickness of thought and the ability to piece together effective and reliable plans are valuable assets. In the same line of thought, rash individuals are considered a liability and can quickly be relegated to non-essential tasks in a peripheral area. Such individuals often spend weeks in their new positions until they have demonstrated that they deserve another chance. As a result, those who are truly talented and ambitious may eventually rise above their peers while those who are simply social parasites quickly find themselves with a decreasing number of opportunities for their futures.

Mercurians must by necessity spend a great deal of time close to one another, a problem which is compounded by a 2.5% birth rate. Over the decades, it has become natural for each member of a family to each have a "haven," a private place where no one else but that person can enter. These small rooms, often no bigger than a soundproof cubicle, serve as a personal sanctuaries where one can take refuge to meditate, read or simply take a nap away from prying eyes. Between their thirteenth and fifteenth birthday, Mercurian teenagers usually receive their own "haven" as a gift from their family, a sign that they have become independent members of Mercurian society, even if they are still dependent on their parents. The haven can be within the family home if space is available, or in a haven building where such space can be bought or rented. Other Mercurians will be loathe to enter another person's haven except under dire need or in case of emergency. If a Mercurian is interrupted while in his haven without reason of sufficient importance, he will ask the offender to leave in a very polite but firm tone, regardless of the person's rank or relation to him. Regardless of the intruder's answer, the offense will never be forgotten, and may only be forgiven after a long time or an impressive effort to rebuild and strengthen the relationship between the individuals.

The lack on space is undoubtedly one of the main reasons why Mercurians favor the profession of space merchant. This is a perfect opportunity for them to move to larger quarters aboard spaceships and to be away from the prying eyes from their neighbors. Some particularly independent Mercurians worship space travel with an almost-religious fervor and dread the time they have to spend back on Mercury with their so-called friends and families. On voyages, the personal quarters of a Mercurian are considered inviolate, and barring negligence in duty or a pressing need, Mercurians will leave others alone when they are in their cabins.

■ CHARACTER CREATION

Game-wise, a Mercurian character is likely to have received a good education (average KNO or better) and most have average or above average human relation abilities (good INF and social skills) or technical skills (good CRE and mechanical skills such as Tinker, Electronics or Computers). Depending on where they grew up, Mercurians will have either a normal physiology (for those raised on the orbiting cylinders) or a Lightworlder physiology (for those who spent most of their time on the low-gravity surface). Characters should have some technical and space-related Skills as well as at least a minimum amount of ship-related knowledge (such as piloting or navigation abilities). All Mercurian characters receive the Spacer's Runic dialect at level 1 at no cost.

4.2

4.2.1

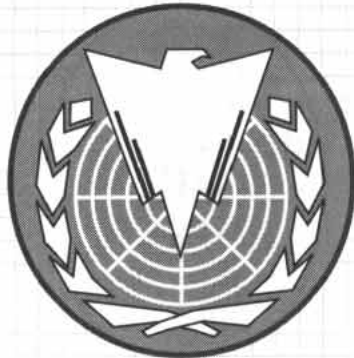
Citizens are often cared from birth to death by the corporation that employs them. They live in subsidized housings, eat at company-sponsored restaurants and watch corporate-owned news network. While there is no shame in buying or using a competitor's products, most employees feel a loyalty to the company they work for and use its products whenever possible.

HOOKS AND TIPS

0057



► THE EARTH SYSTEM



Earth, as it has ever been, is a fragmented world, its people a constellation of cultures and traditions. While CEGA is the power that now rules the Earth and its surroundings, nations in the middle-east, Africa and Asia all maintain independence from their imperialist neighbor. Though there is no longer a state of war between CEGA and its Earthbound neighbors, small skirmishes break out on a regular basis between the parties involved. Any who travel on the surface of the planet are advised to stay well within the borders of the particular nation that they are visiting, lest they become entangled in the heated international politics. Travelers should also be on the look out for terrorist or guerrilla activity wherever they are, and steer clear of anyone who would like to get them involved in their disputes. Despite the conflict that raged among the nations of the Earth in the past two centuries (or perhaps because of it) the Earth remains the most culturally diverse human world in the system. The myriad of smaller nations on the surface, the CEGA-affiliated territories, the Orbitals and the moon each have a distinct culture, and there are often subtle cultural differences within these larger groupings.

▼ THE PEOPLE OF EARTH

Despite the immense diversity that exists among the people of Earth, most of the inhabitants of other settlements in the system have come to associate the CEGA culture with the Earth. National stereotypes, however, can hardly be applied to the entire territories administered by the CEGA, since its typical citizens vary from one culture to the other. Nonetheless, a few specific trends have emerged and are common to most regions.

Many Terrans are somewhat arrogant and condescending as a whole. They share a general philosophy of superiority from living in the cradle of Mankind. Despite their mismanagement of the planet's resources, they take great pride in their autonomy and history, claiming that none of the off-world colonies' cultures can hope to compare to the countless centuries of civilization on Earth. To many, however, it is readily apparent that this arrogance conceals an unease at their present living conditions and masks a deep-seated fear and envy of the space settlements because of their wealth. Most Earth citizens privately mourn the downfall of their respective civilizations and of their planet in general, feeling that they were once at the center of all things and that this rightful position now eludes them.

The average CEGA citizen is generally poor, unless he belongs to the privileged caste that organized and controlled the Unification Wars. Among those, military service is valued and respected, with the highest prestige being associated with officer status. Where the fighting was fierce, however, soldiers are often viewed with suspicion and mild hostility by the populace. Most of the common people of Earth live in great arcologies. Many of the old cities were damaged or destroyed through fighting or urban decay brought about by poverty and lack of care in the centuries between the Industrial Revolution and the present. Arcologies, some dating back to the early twenty-first century, attempt to provide people with decent (if cramped) living space that is efficiently organized and highly ergonomic. The latter have an overall higher quality of life and are generally more open to off-world people and culture, to which they are regularly exposed.

Education is often a matter of luck, political connections or above-average wealth. Most Earth inhabitants are barely educated and the illiteracy rate hovers just above 85%. Math are seldom taught beyond the four basic operations and most people can't count above a hundred. Under the CEGA regime, education is only provided to "politically approved" families and strictly regulated by a near-facist education board. Outside of arcologies, the situation is both better and worse. Education is more liberally offered, providing that a family can afford the modest fees required by the teachers. While some of the latter are sedentary, most wander from village to village, providing some basic education to the people who ask for it. They then move on with their circuit, returning years later to continue where they left. Those journeyman teachers vary greatly in dedication in ability, but are more often than not competent enough to teach basic reading and arithmetic.

In the villages and towns outside the CEGA arcologies, the more educated people tend to and monitor the automated systems that salvage what remains of the ecosystem. The rest of the population lives low-key, rural existence, drawing a poor subsistence out of the soil, sometimes making a surplus that can be sold or traded for hi-tech goods. Many of these people harbor dreams of emigrating to the city or even the orbital complexes.

■ CHARACTER CREATION — EARTH

Game-wise, an Earth character is generally very average in his physical abilities, though many people have good BLD or FIT from the hard work required to make a living from the damaged land. Earthers tend to lack education (under average KND), unless their family is part of the military or the CEGA bureaucracy, which provide a much better schooling. Space-related skills are virtually nonexistent, except for the soldiers and diplomats who must travel to other settlements or planets. All Earth-born characters receive one extra language (Player's choice) at level 1 at no cost.

THE ORBITAL SETTLEMENTS ▼

The space societies of the Earth system are commonly known simply as the Orbitals. The name includes all space settlements, beginning with the transfer stations and workshops of low orbit to the colony and autofactory clusters at the various Lagrange points. The Orbital society is composed of many different cultures and ethnic groups, generally based on who (or what) financed the construction of their particular station. A common thread between the cultures of the orbital communities is their shared knowledge of space emergency procedures, which is taught to children from a young age. All Orbital citizens are at least minimally trained in zero-gee and emergency space conditions. They also share a few other personality traits that arise from their peculiar environment.

The average Orbital citizen is often soft-spoken and easy to get along with. Life in the orbital colonies is somewhat slower, less frantic than elsewhere. The Orbitals don't have fast cars, but they have a wealth of resources and generally enjoy good living conditions. This is one of the main reasons why the CEGA benefit from a high level of support: they help to protect the Orbitals' sheltered way of life.

Most of the Orbitals work in the manufacturing or service industries. Those in manufacturing have a good knowledge of computer and technology to maintain and repair the machines that do most of the actual work. This is long and solitary work, and to compensate, they are fond of social gatherings, often in a sport context.

Outside of work, Orbitals enjoy arts and entertainment, most of which are imported from Earth below. This exposes them to CEGA propaganda and ideology, but no one seems to mind. They are sufficiently removed from the troubles of Earth to ignore most of it and take only what is pleasing or useful. One fashion that has recently emerged is the colorful bald-and-bandana look that is the latest fad from the arcology of Reykjavik, world center of fashion and style. Orbital tourists are often recognized by their flashy outfits, which are in sharp contrast to their otherwise self-effaced manners.

CHARACTER CREATION — ORBITAL SETTLEMENTS ▣

An Orbital character will have some simple technical and space-related skills, including a basic knowledge of the scientific principles governing life in space. All will have a good education (average KNO) and tend to be bright and level-headed (slightly above average CRE). Depending on where they grew up, Orbitals will have a normal physiology (for those raised on the orbiting cylinders) or, more rarely, Lightworlder physiology (for those who spent most of their time in the smaller non-rotating orbital workstations). Characters from a service-industry background will have high INF and social Skills while characters with a manufacturing-industry background will have mostly Skills of a mechanical nature.

THE MOON ▼

The inhabitants of the Moon are always easy to spot in a crowd. Tall, pale-skinned and lanky, they exhibit an economy of movement and talk, a trait they share with the Nomad culture. Many Selenites are well educated. Even the lowly miners need to have a large body of knowledge to control and maintain the various automated pieces of machinery that do the actual grunt work in the mines and pits of the surface.

The culture that developed among the Moon's early settlers emphasizes discipline and hard work. Punctuality is praised as a virtue, and Selenites hate to be late at meetings or for scheduled activities. They always wear a timepiece of some sort, and seem to refer to it every five minutes. This is slowly changing, however, as many realize that times have changed and privations need not continue in order to ensure the survival of the lunar settlements. A growing discontent is spreading through the poorest segment of the population, who have begun to feel that hard-won profits should be used to relax the Selenite society.

Once off duty, however, the Selenites allow themselves to relax and let out some of the stress by exercising (to compensate for the Moon's low gravity) or by listening to subtle, sometimes even gloomy mood music. They occasionally "party hard," but only in private bars or apartments, never in public, where loud and boisterous behavior is a social taboo. Off-worlders are seldom invited to such parties, however, because Selenites dislike sharing their intimacy with strangers who do not understand their customs.

CHARACTER CREATION — THE MOON ▣

Lunar characters will tend to be physically weaker but taller, as the Moon's gravity field is much weaker than the one of Earth (the Lightworlder Attribute limitations should be used when buying stats). Because of the cultural outlook of the Lunar society, they will tend to have a rigid discipline that may well be the party's salvation in dangerous situations (above average WIL). All Lunar-born children learn from an early age the various security procedures and how to use survival gear and space suits, as well as the basic physical principles governing life in space. Due to the large amount of mining operations which are dispersed across the planet, many Lunar characters will have one or more levels in an Earth Sciences Skill, probably geology or mineralogy.

4.3.2

4.3.3

HOOKS AND TIPS

end of section 4.3 the earth system



► THE RED PLANET



Mars has long attracted a hardy brand of pioneers. Most of the immigrants that made their way to the Red Planet in the twenty-first and twenty-second centuries were of one of two groups. The first one was composed of people escaping tyranny, war and persecution; these have an aversion to central government control. The others were escaping poverty and hardship, sometimes persecution. They wanted only to find a peaceful place to live, and were more ready to accept a more strongly hierarchised society in exchange for security. Both had to make many compromises to build a new world for Mankind. Martian history has demonstrated that the experience was less than successful, and that the diametrically opposed philosophies are hardly compatible. While timid attempts are made by prudent diplomats to re-establish formal relationships between the Republic and the Federation, most observers foresee that the situation is only going to deteriorate in view of the growing tensions between the CEGA and Jovian governments. Regardless, despite their many cultural differences, the Martians share several characteristics, probably linked to the fact that Mars presents an almost homogenous environment.

▼ THE SANDS OF MARS

The early Martian settlements were located hundreds of kilometers from one another, though many preferred to live in one of the few founding cities. Most of these later became the core of the Martian Federation. The various isolated farms, science stations and terraforming installations fostered an independent streak among their inhabitants, which later caused the schism between those wanting an organized, secure society and those that had fallen in love with the rusted deserts of their new home. The early colonists created a dedicated surface courier service between their settlements which later grew into an independent corporation. Nowadays, United Martian Delivery Services has a foothold in both societies and is possibly the last vestige of those better days when Martians worked with each other without discrimination.

Martians like their personal space. They have grown accustomed to the great open grounds of their planet and feel distinctly uncomfortable if people stand too close to their personal "sphere." They prefer confined spaces, which they encounter often in airlocks and cramped homesteads, but they need to know they can go out to be alone. They appreciate the company of their peers, but only in small doses, no more than a few hours at a time. These apparent contradictions have led to many misunderstandings on other worlds, and has reinforced the Martians' reputation as unpredictable and irritable individuals. This is more than compensated by their competence, however, and Martian engineers, for instance, are perhaps the most-sought ship personnel throughout the solar system.

Martians have grown used to the low temperature of their home planet and generally exhibit a high degree of tolerance to cold. It is not unusual for them to turn down the thermostat, and they often complain about the heat when they visit other places that are kept at a more sedate room temperature (like most orbital stations and spaceships). They frequently shed a few layers of clothing in order to remain comfortable in warm environments, although decency remains an essential part of the Martian life style.

Martian fashion is mostly form-fitting for the general population, and loose and bouffant for politicians and corporate executives who can afford the added risk of wearing non-efficient attires. Martians favor strong and firm handshakes, but otherwise frown upon physical contact in public. They also put a great deal of importance on physical health and appearance, which explains the origin of the expression "Martian babe/hunk."

As a whole, Martians are not a promiscuous people, and dislike public displays of affection. They keep their distance from each other, seldom coming closer to one another than a few feet. Their courting habits appear to be a complex and slow process, with the women being in charge of the pace of the relationship. Martian women are extremely protective of their husbands, and have little tolerance for potential competitors. They also despise men who court two parties at the same time, giving credence to the expression, "On Mars, you court two girls, you make two enemies."

■ CHARACTER CREATION — MARS

Depending on their origin, Martian characters will tend to be either disciplined, strict people or free-thinking individuals with a rebellious streak; the polarized situation of the planet tends to be reflected in its population. Otherwise, though, the Martians form a more homogenous group than they like to think. Physically, Martian characters are somewhat weaker and taller than humans living under one gravity, though many of them follow extensive physical conditioning routines to avoid losing muscle tone (Martians may use the Lightworlder Attribute limitations). Much like in Lunar societies, Mars-born children learn from an early age the various security procedures and the use of survival gear. They also learn the basic physical principles related to pressure and atmosphere, and the peculiarities of the Martian environment (fear of sand storms is an unfortunate if healthy side-effect of this aspect of Martian culture).

4.4

4.4.1

HOOKS AND TIPS

MARTIAN FREE REPUBLIC ▼

The citizens of the Republic have often been likened to the settlers of the old nineteenth-century American West. Strong-willed and self-dependent, they have a frontier-like mentality, distrustful of strangers and hardworking. They live in small towns and settlements where everyone knows everyone and secrets are hard to keep. They do not live apart from the world, though: all homesteads are equipped with high-gain antennae and satellite dish to remain in contact with the rest of society. Technical expertise and jury-rigging are part of every Republican's life, and teenagers often compete with each other based on their technical know-how.

Republicans value friendship and honesty above all. Though their trust is hard to gain, they remain extremely loyal once befriended. They do not take well to betrayal, however, and will likely not forget the offense. Some Republicans have taken the habit of exchanging a bond-token with some of their best friends to express their sincerity and appreciation. The token is often a bracelet worn on the left hand (for the men) or a neckband (for the women), and is seldom exchanged between husband and wife since they already share a much deeper bond. Stealing, damaging or simply hiding the bond-token is a sure way to earn the wrath of a Republican.

Free Republicans are brutally honest, a trait that has started more than one brawl in the taverns of Sirtis Major and Olympus Mons. They say what they think, often loudly, and never let an argument go until it is resolved (even through a good natured fist-fight if required). On the other hand, grudges about such differences of opinion are rarely held and brawling fighters may share a beer the very next day.

The Republican homesteads have strong traditions of hospitality, dating back to the early colonists. These traditions are a results of the harsh Martian environment and its sudden sand storms, which could doom travelers stranded in the open. In the early days of the colonization effort, it was customary for the hosts to give some form of parting gift to their visitors, usually a waybread, some salt and some water. This practice has survived over the years, even though the portions have been greatly reduced since few people actually need the gift. Another variation on that tradition prescribes offering a glass of Martian tonic (or beer) and a warm blanket as soon as a visitor steps into the host's house.

Republicans have the constitutional right to bear arms without a permit, and jealously cherish that privilege, even (or especially) when away from their homes. Firearm training and responsible handling are part of the children's education, and despite the amount of firearm in circulation accidents remain rare. They strongly dislike the restrictions which other societies often impose upon them, and only very reluctantly give up their weapons when in foreign territory.

MARTIAN FEDERATION ▼

The Federation citizens are used to a controlled society ruled by bureaucracy, and do not think much of it anymore. They shuffle about their daily business, their ambition reigned in by the rules of the society around them. They have a quiet pride in their nation and its accomplishment, and will resent any badmouthing about it. The citizens are expected to publicly advocate the Federation and the media never mention events in the Republic unless they serve to demonstrate how superior the Federation is to its neighbor. Recently, the Ministry of Peace and Justice has voted some laws to encourage citizens to report individuals whose loyalty to the Federation is dubious. This has caused some turmoil in the universities, especially among those that advocate free thinking, but the media played down the incidents of violence and no public figure addressed the situation.

The Federation has long suffered from accusations of fascism and totalitarianism, which are partially true. Its citizens, however, have grown accustomed to the frequent identity checks and the weight of numerous rules of conducts, and most will be genuinely surprised if someone complains. They regard their lesser freedom as something to be proud of, since it allowed them to survive a harsh environment, and sincerely believe that it is the cement that strenghtens their society, not weakens it. Had Otto Kurtz not insitgated some of those measures when he did, the Federation might have ended up in the chaos which frequently rocks the Martian Republic. Indeed, most citizens have a high degree of respect for Kurtz and will often visit his memorial. They celebrate the anniversary of his arrival on Mars every year, and all but essential services are closed for the duration of that day.

Unlike Republicans, Federate citizens do not have the right to bear arms (especially not concealable ones) and don't really mind. The police is everywhere and equipped with enough firepower to deal with most threats effectively. Pocket knives and small defensive weapons are tolerated, but confiscated and prohibited after a first misuse offense. As with all things in the Federation, justice is swift and merciless. Citizens dutifully follow the rules, and are often easy to recognize on other worlds by the attention they pay to all those insignificant rules which everybody else ignores (jaywalking, minor cheating on income tax reports, crossing on a red light, etc.).

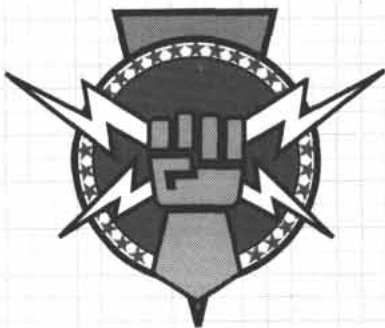
As a whole, the Federation is a highly successful society, and while it is maintained through political force, there is no denying its achievements. Some of the best universities in the solar system are available in the Federation and the citizens enjoy a rather high quality of life for a former colony.

4.4.2

4.4.3

end of section 4.4 The Red Planet

► THE NEW OLYMPIANS



The inhabitants of the Jupiter settlements have often been condemned as smug and arrogant, but they have many reasons to be proud of their achievements. They live in one of the most breathtakingly beautiful and inhospitable regions of the solar system, yet have harnessed both its power and resources to supply them with almost unlimited wealth. Their position, practically at the top of the Sun's gravity well and remote from the rest of the human-inhabited inner system, provides them with security and military might. Jovians as a whole form a prudent nation, sometimes to the point of being paranoid. They display an uncanny ability to be prepared for anything and everything, sometimes investing far too much energy in covering some more remote possibilities. While this would be a strain on anyone else's resources, the Jovian Federation is no pauper, and can afford to literally waste a good percentage of its budget on strengthening its assets, be they military or economic. As it is, Jupiter's military might probably surpasses that of Earth and CEGA, but it covers such a wide patrol area that some suspect it might not be able to withstand a concentrated attack.

▼ KNOWLEDGE

The Jupiter settlements developed from remote mining colonies to one of the solar system's superpowers in little more than a century. The large immigration of wealthy, well-educated colonists resulted in a free-thinking if a bit carefree society. The overall level of education is fairly high, mainly due to the large proportion of immigrant scientists and technicians. Education is encouraged and easily accessible, most often through automated teaching programs (and human counselors for guidance) that adapt themselves to the students' abilities. This results in a broad cultural base, and most Jovians are capable of sustaining long, intelligent conversations on many difficult topics. Most Jovians are unfortunately aware of that social characteristic, and several citizens have acquired a pedantic streak, earning the aversion of some of the less-educated societies of the solar system (the Nomads or CEGA come to mind).

Jovian society, over the last few decades, has become daringly liberated from sexual taboos, and this has earned Jovians a reputation for loose morals and perversity. Nothing could be further from the truth, however. Jovian citizens have simply eliminated much of the shame which surrounds the physical expression of love, and have in fact tried to teach others in the solar system that repressing their natural instincts only leads to violence and dysfunctions. While Jovians like to dress lightly, however, they are no more promiscuous than anybody else.

The current generation knows little of the hardship of the first few decades of the Confederation, and most enjoy their wealth without thinking much of the blood and sweat that brought it into being. Older people tend to scorn at this, and proffer constant warnings that go unheeded. Living space is rather restricted, but there's plenty of water, air and food for everyone, plus a great deal of resources left over for fun. As a result, Jovians are fairly considerate of their peer's need for privacy, but they are rather wasteful of their resources. Jovian tourists are notorious for their littering and little regard for pollution.

Real estate aboard Jovian stations is extremely expensive, and as a result most citizens can only afford small but comfortable quarters. They spend most of their time at work during the day, or at malls or in parks at night. They essentially eat and sleep at home, but do little else in their quarters. This tends to crowd public areas, and unsuspecting tourists are often overwhelmed by this situation.

Jovians have a poor understanding of what it means to be a destitute, however, and have developed some arrogance about their own wealth. They are often judgemental of other societies who have not managed as well as they have with their limited resources, and believe that individuals who are broke are responsible in full for their misery. Society, they claim, can only do so much for people, and those who don't succeed should ask for help or try harder. This philosophy, however, is not apparent at first, and Jovians usually appear sociable and sympathetic until the topic of poverty is brought up.

The Jovian society has spent a great deal of its resources building up a strong and reliable armed force, and Jovian citizens take great pride in the little time it took them to do it. The military, being relatively new and idealistic, has earned much respect from the general populace, and its few heroic figures have inspired throngs of youth to join this last two years.

■ CHARACTER CREATION — JOVIAN CONFEDERACY

All Jovian Confederation citizens will have some simple technical and space-related Skills, including a basic knowledge of the scientific principles governing life in space and training in emergency survival procedures. All will have a good education (average KNO) and tend to be bright and level-headed (slightly above average CRE). Most of them live aboard rotating cylinder stations and have a normal physiology. Very rarely will a Jovian citizen have a Lightworlder physiology, though it may happen to people who spend a lot of time in one of the smaller colonies of a Trojan state or on one of the Jovian moons.

THE TROJAN STATES ▼

The Trojan States lie far away from the rest of the Confederacy, but still retain strong cultural bonds with the rest of the Jovian citizens. They share their wealth and carefree attitude about life, enjoy similar benefits and face much of the same restrictions. They have some military outposts to support the Jovian forces patrolling their area of space, but are hardly militarized themselves.

There are, however, some cultural difference due to the large distance that separate the Trojans from the rest of the system. The Trojan States have to be self-reliant, as they do not have Jupiter and its moons nearby to provide a seemingly unending flood of raw material and energy. Despite their great mineral wealth, the Trojans must trade for their water and volatiles and spend much time building and maintaining solar collectors. Hard work is thus seen as a virtue, much more than in Olympian society. In this respect, the Trojan settlements have an outlook on life that is somewhat closer to the Nomads. Being the equivalent of "provincials," Trojan citizens are much less arrogant about their achievements as Jovian themselves. They appreciate Jovians and cheer at their victories over CEGA, but remain prudently neutral about their own military involvement, which is far from being significant in any case.

Despite being seen as country hicks by the Olympians, the Trojans actually enjoy high standards of living and education. Information travels freely between the States, and the Trojans are just as eager as their Olympian cousins to find activities to escape the claustrophobic confines of their homes. One particularly popular hobby is that of space bike racing, using bikes equipped with pedal-powered ion engines. Several media follow the weekly exploits of the crowd's favorite bikers, and many ambitious teenagers can't wait to get their shot at fame and glory.

Trojan families place much emphasis on safety and education. Compounded with the traditional Jovian paranoia, this has contributed to make Trojans far less wasteful than anyone else in the solar system. It is not uncommon to see a Trojan save the leftovers of a meal for later use. Waste nothing, need nothing...

CHARACTER CREATION — THE TROJAN STATES ▣

The Trojans's lives are very similar to the ones of their cousins in the rest of the Jovian Confederation. All of their citizens are trained with basic knowledge of life in space and emergency survival procedures. All have a good education (average to above average KND) and tend to be bright and level headed (slightly above average CRE). Unless they live in one of the older, smaller colonies, the Trojans will have a normal human physiology.

TITAN ▼

Titan, Saturn's largest moon, is home to the solar system's current farthest permanent settlement. Though Titan is nominally international territory, the main colony is under the control of a Jovian company, THC. Many of its inhabitants are often just temporary, lured to the cold reaches of space by the rewards of hydrocarbon mining in the depth of the moon's oceans. Such a hard life requires hardy, tough people, and most Titanians are just that.

The Titanian mining settlement is a lonely, isolated place. Its inhabitants are months away from the rest of humanity, and even messages are hours out of date. This create an atmosphere of loneliness that tend to encourage people to form "family" bonds with fellow workers. Those "employees" who spend more than a few years on Titan tend to think of themselves as Titanians rather than Jovians (or whatever nationality they originally were) because of the strong ties they form with their fellow workers. In a hostile environment such as that of Titan, bonding with people who are close to you and whose actions may save your life is far more important than any national attachment. As a result, Titanians are seldom prejudiced and only judge people based on their work attitude and ethics. Many also develop hobbies to fill the long hours. Titanians are reputed to be skilled ad-hoc artists, with a high proportion of painters and musicians among them.

Titanians don't have much of a fashion sense, however. They live far from any cultural center and pay little attention to what they wear, as long as it's clean and without holes or tear. They don't have access to fashionable clothing in general, although the occasional Mercurian merchant can drop by and make a fortune by selling some fine clothing to the fashion-starved mining colony. In general, any foreign art and entertainment is greatly appreciated by the workers.

CHARACTER CREATION — TITAN ▣

Any character that has some Titanian experience in his background is likely to be strong willed and very self reliant (medium to high WIL). The low gravity of Titan means that unless rotated regularly to a gravity environment, characters who live on the surface of the moon should use the Lightworlder limitations. Inhabitants of the orbital processing stations will have no modifications, due to the standard 1-g gravity found there. Most Titanians will have a number of mechanical, pilot-related or scientific Skills, and all of them will have received some training in space procedures. Otherwise, they come from all walks of life and have Skills related to their jobs. If they so choose, Titanians can also have an above-average artistic talent (CRE 0 or better).

4.6.1

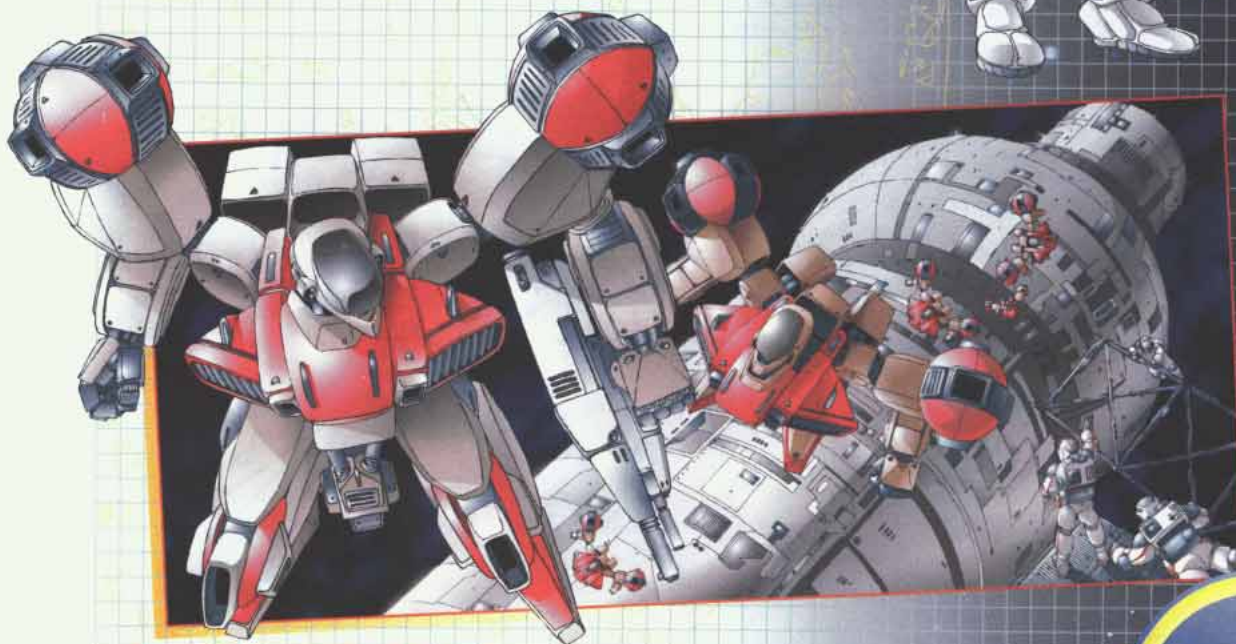
The asteroid-dwellers live in small groups. Nomads value friendship and family bonds. They feel uncomfortable around total strangers, though they do not shun them — other Nomad groups represent possible allies and mates for the youngsters. Families are highly self regulated, both to prevent overcrowding and because low-gravity pregnancies require special attention that may not be available during certain periods. Nomads have few personal belongings, but are protective of what they do have. Tools and instruments are generally the property of the entire tribe, and are to be shared and maintained by all users. Resources are also precious, especially water, which is found only locked in certain types of asteroids.

end of section 4.6 nomads
HOOKS AND TIPS



► IN THE SHADOW OF MERCURY

The main Mercurian settlement is the aptly named Helios Station, a large Vivarium-type colony stationed in an orbit that regularly brings it in the shadow of the planet. Large, energy-hungry ion thrusters constantly correct its trajectory, making sure the cylinder does not wander into the rays of the Sun. The constant cycles of exposure to the vibrant solar heat followed by the glacial cold of Mercury's shadows are used to produce power through a heat exchanger system. These fulfill most of the energy requirements for the internal life support systems of the station. These generators are supplemented by the power stations located on the surface of Mercury itself and in orbit around the planet. Though it is not visible in this picture, the station is tethered to a space dock where the sail barges of the Merchant Guild come to dock.



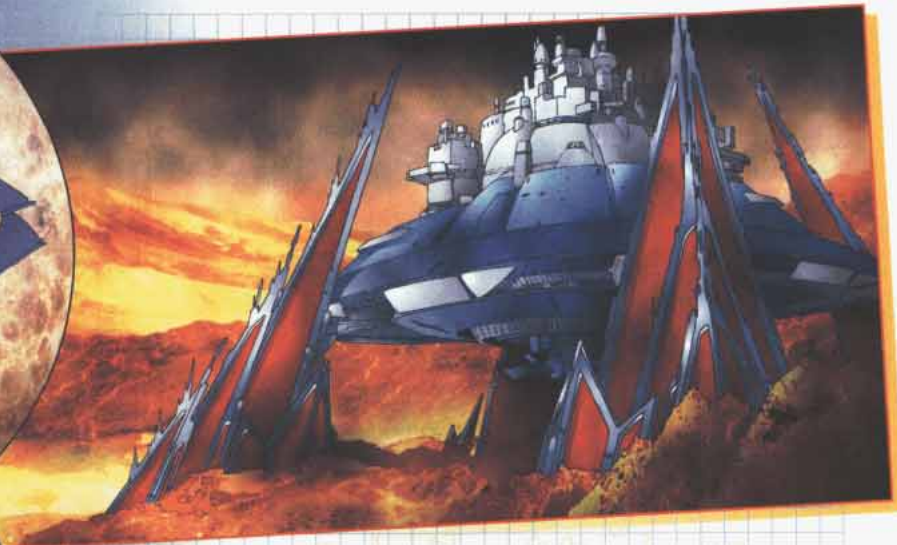
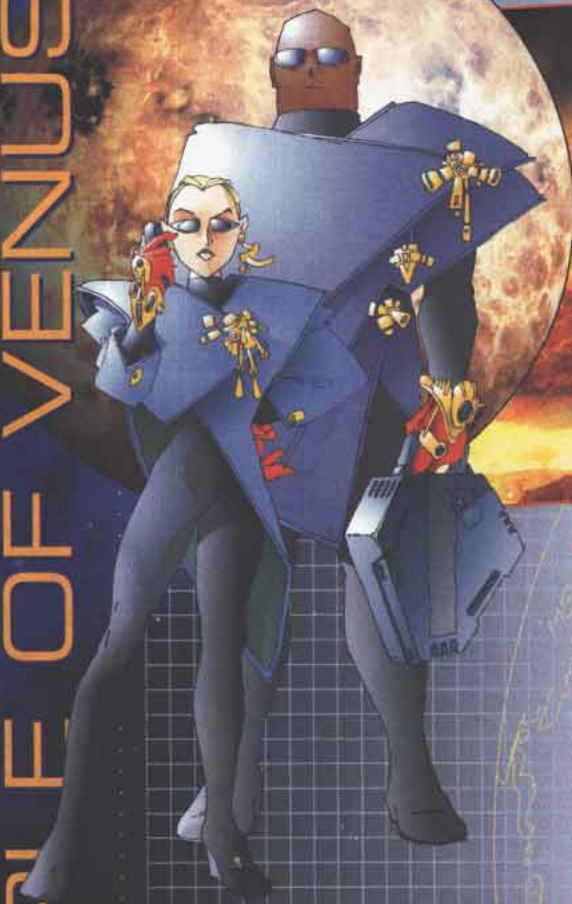
► THE AVATARS OF MERCURY

Exo-armors, once rare in the innermost solar system, are starting to become more common as their worth and versatility is established. The government and traders of Mercury have recently started producing homegrown designs such as the *Brimstone*, machines that are designed both as fast interceptors and flexible engineering units. This seems to be the case for most Mercurian exo-vehicle designs, which all feature large thruster arrays (often at the cost of operating range). Mercury is too small to adequately support a full-time military force, and thus exo-pilots often find themselves drafted into engineering and cargo handling duties.



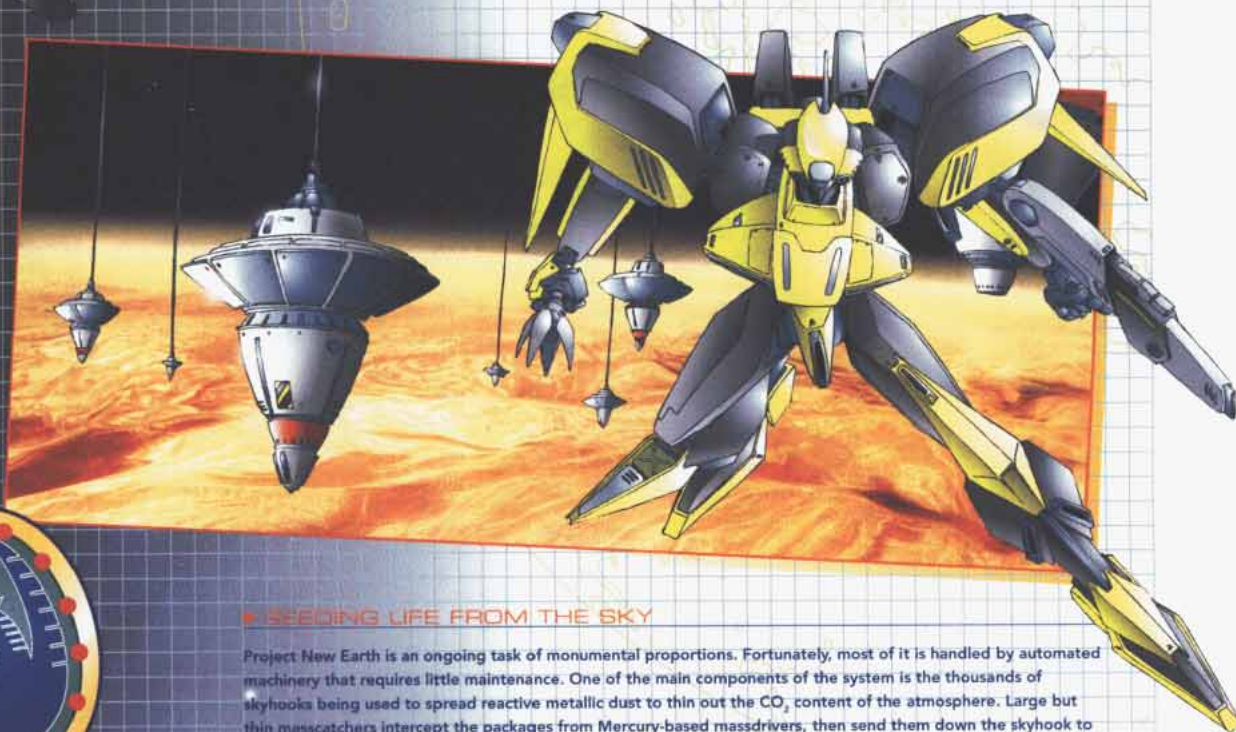


PEOPLE OF VENUS



► THE HANGING GARDENS OF BABYLON

The arcology of Sakura is a fairly typical Venusian city-state. Like all Venusian buildings, it is raised high above the cooling but still burning ground on titanium pillars. Built in 2175 by the Waldsen-Nishiyama corporation, it currently houses nearly a million people under the thermal isolation of its thick aerogel walls. Each of the massive titanium struts that anchors it to the boiling Venusian soil is equipped with large heatsinks that extend hundreds of meters into the sky. These can modify their albedo to reflect as much light as possible during the long day and release as much thermal energy as possible into the night sky. Numerous freestanding heatsinks dot the area around each city-state, carefully calibrated by a network of computers to radiate heat away into space to ensure the stability of the thin Venusian crust. Heatsink construction, despite being one of the major Venusian planet-side industries, is mostly automated and self maintained, and thus costs little to the Venusian treasury. In fact, the same can be said of the entire Venusian terraforming process.



► SEEDING LIFE FROM THE SKY

Project New Earth is an ongoing task of monumental proportions. Fortunately, most of it is handled by automated machinery that requires little maintenance. One of the main components of the system is the thousands of skyhooks being used to spread reactive metallic dust to thin out the CO_2 content of the atmosphere. Large but thin masscatchers intercept the packages from Mercury-based massdrivers, then send them down the skyhook to be processed. The same systems also deploy genetically engineered algae and micro-organisms. In a few centuries, the skyhooks will be used to spread water onto the parched surface, creating new seas.





► SIEGE OF POWER

The arcology of New Berlin houses the main administrative center of the Central Earth Government and Administration (CEGA). The arcology was built to replace the old city that had seen much of its downtown area destroyed in the riots of 2056 (the same riots that pushed the family of Martian Federation founder Otto Kurtz to emigrate to Mars). The CEGA Council Tower is a more recent addition, dating to 2187. Inspired by art-deco design, the well-guarded Orbital-alloy building towers over the skyline. A large council room inside the core receives the various delegates from across the Earth system. There is a helipad on the rooftop, and various docking ports for lighter-than-air vehicles ring the upper stories. Unknown to most, numerous defense systems hidden within the walls watch the sky for hostile forces.



► HIGHWAY TO SPACE

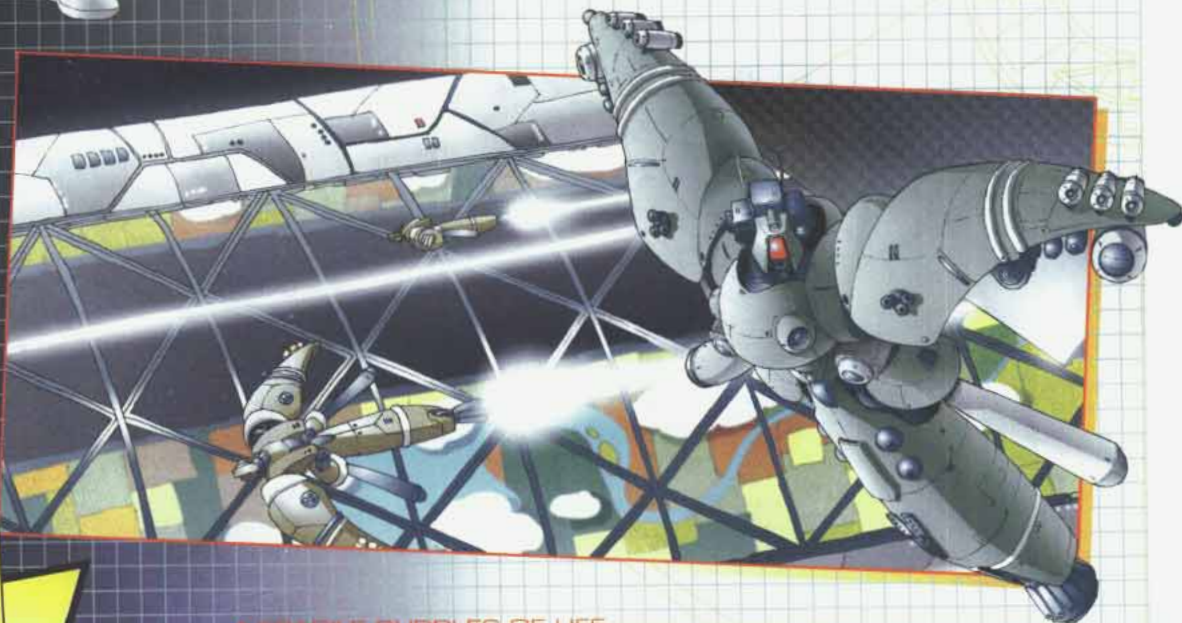
Skyhooks are a major component of the Earth's ground to space transport system. They serve both to hoist cargo out of the gravity well and to boost vehicles leaving Earth orbit. Early designs were little more than automated satellites with two opposing tethers, but more modern skyhooks are full-fledged space stations orbiting the Earth at medium altitude. Orbital-manufactured alloys of incredible tensile strength allow the tether to extend deep into the atmosphere, stopping just within the stratosphere. This vastly increases the number of vehicles that are capable of reaching the lower loading dock, making access to orbit almost simple.





► ISLANDS IN THE SKY

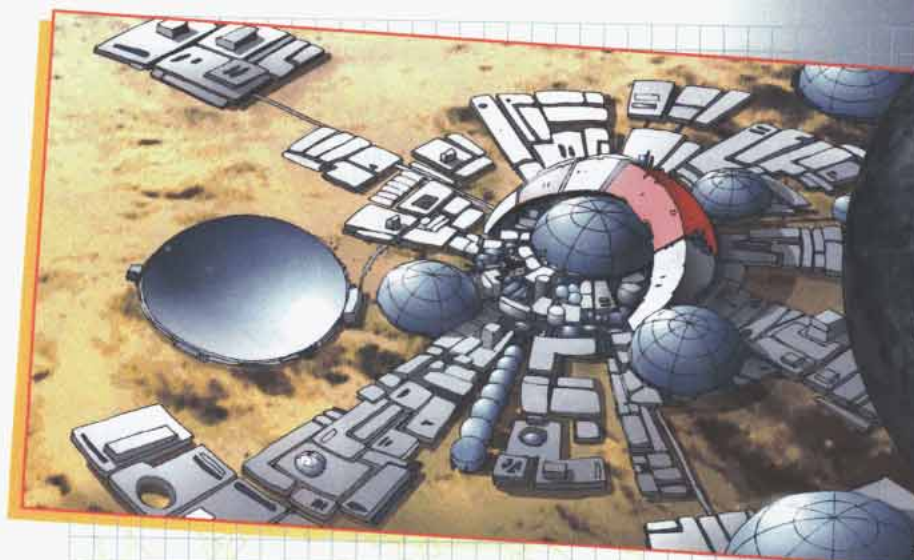
Many of the more recent Orbital constructs have been built along the century-old O'Neill Island III colony concept. Size and exact mirror configuration vary, but they all consist of a rotating cylindrical layout for the habitat sections and huge mirror fields that reflect light into the colony. This picture shows a colony cluster at the L5 point; included in the frame are L5-61 "Aldrin" (top), L5-62 "Magog" and L5-65 "New Montréal", all ringed with agricultural modules. The lack of atmospheric distortion makes it hard to truly appreciate the enormous size of these space constructs. The spaceships pictured at right are actually many kilometers closer to the viewer than the nearest cylinder. Although they are not visible from this distance, shuttles glide endlessly around the stations, transferring workers and cargoes to and from factories and power satellites. The scale also cannot show the colony transfer system, the space equivalent of an underground subway. Engineless capsules use the rotation of the cylinder to fly to a nearby colony, where they are brought aboard.



► FRAGILE BUBBLES OF LIFE

The colonies are well defended by squadrons of interceptors, exo-armors and ships, but they remain fragile bubbles of life whose continued existence depends to a large degree on the good will of their neighbors. A blown window panel will only cause a slow atmospheric leak, easily replaceable — but blow enough of them at the same time and the situation becomes very dire for the inhabitants. There are regular patrols along the periphery of each local colony group and squads of engineers remain space suited at all times to ensure a fast response to emergencies. They have access to specialized transport monorails that follow each main window pane.





► THE MEN IN THE MOON

Drygalski is a typical Selenite municipality, located only a few dozen kilometers from the southern polar ice mines. It has grown from relatively modest beginnings to a large settlement housing many thousands of people. The older buildings are located in the center, with newer developments surrounding them. The development of radiation screens has allowed the construction of many more structures on the surface, whereas they were previously built underground for protection. The subterranean nature of the city is still evident today, with most streets and access walkways located under the buildings. The large semi-hemispherical structure over the downtown core is also more recent and houses government and administrative offices, as well as high-priced apartments. The large bowl-shaped mirror depression at left is an astronomical observation telescope.



► A GIANT SLINGSHOT

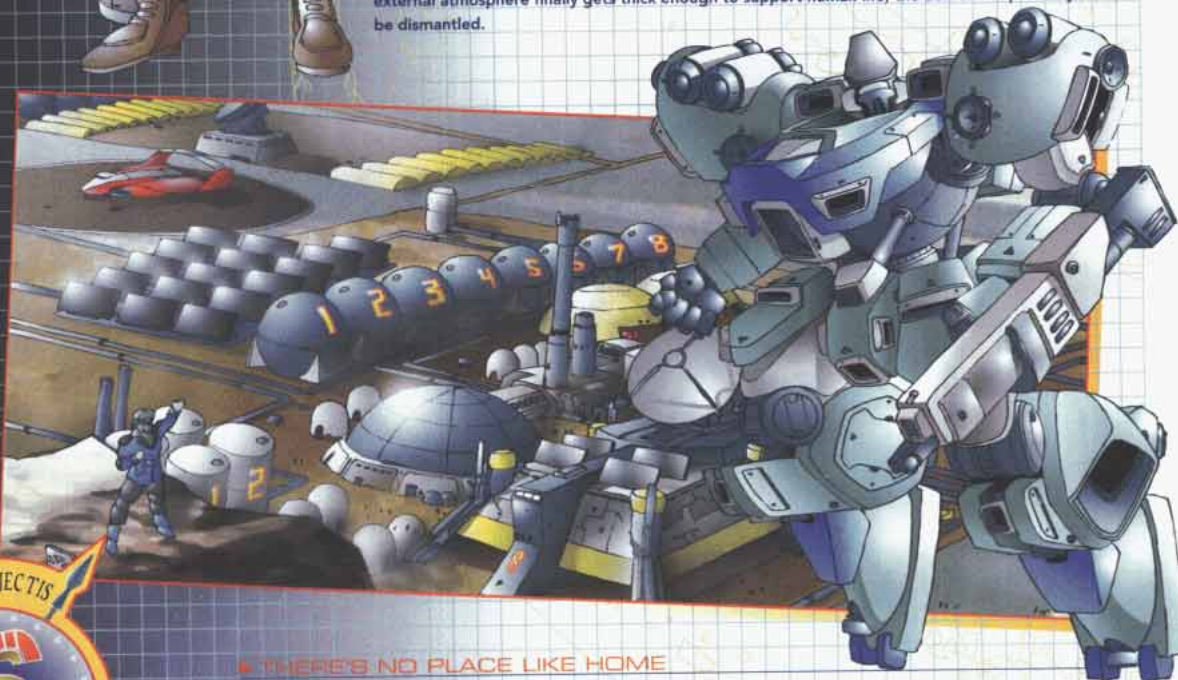
The lunar massdrivers are one of the main pillars of the conquest of space. It was these that provided the raw material that was used to build the first permanent orbital settlements. They are still crucial to the Selenite economy today and send up packets of ice and refined minerals to waiting ore collector barges at the L2 point. These are then sold to customers in both low Earth orbit and the more distant Lagrange clusters. The large rings shown in this picture are the final vector correction stations, where laser beams measure the payload's position and speed to ensure that it will be placed on the right trajectory. Correction will be applied by electrostatic methods.





► CITIES UNDER GLASS

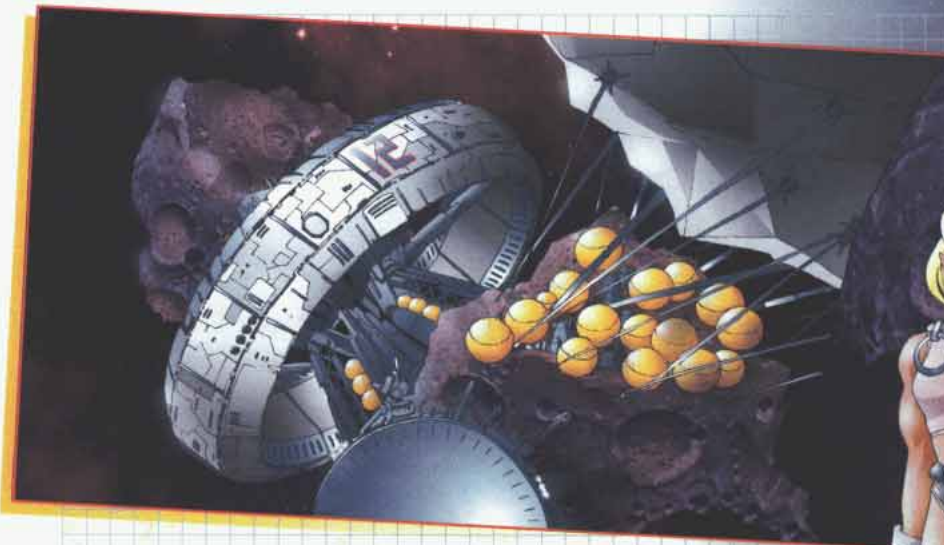
The older Martian cities are located in the lowlands, where the air pressure is slightly higher. Most are now part of the Federation, though a few have sided with the Free Republic. Many cities were built near dried riverbeds in the hope that water would once again flow there some day. Regardless of their allegiance and location, all cities are protected by large faceted artificial crystal domes that both hold internal pressure and serve as conductive lattices for radiation screen generators. The presence of the dome over the downtown core allows citizens to move about the city unencumbered by pressure gear, a distinct psychological benefit to people used to airlocks and pressurized rooms. Smaller domes cover other districts and are connected to the older core by underground tunnels and walkways, lending the Martian metropolises the aspect of a field of segmented mushrooms. In a few centuries, when the external atmosphere finally gets thick enough to support human life, the domes will probably be dismantled.



► THERE'S NO PLACE LIKE HOME

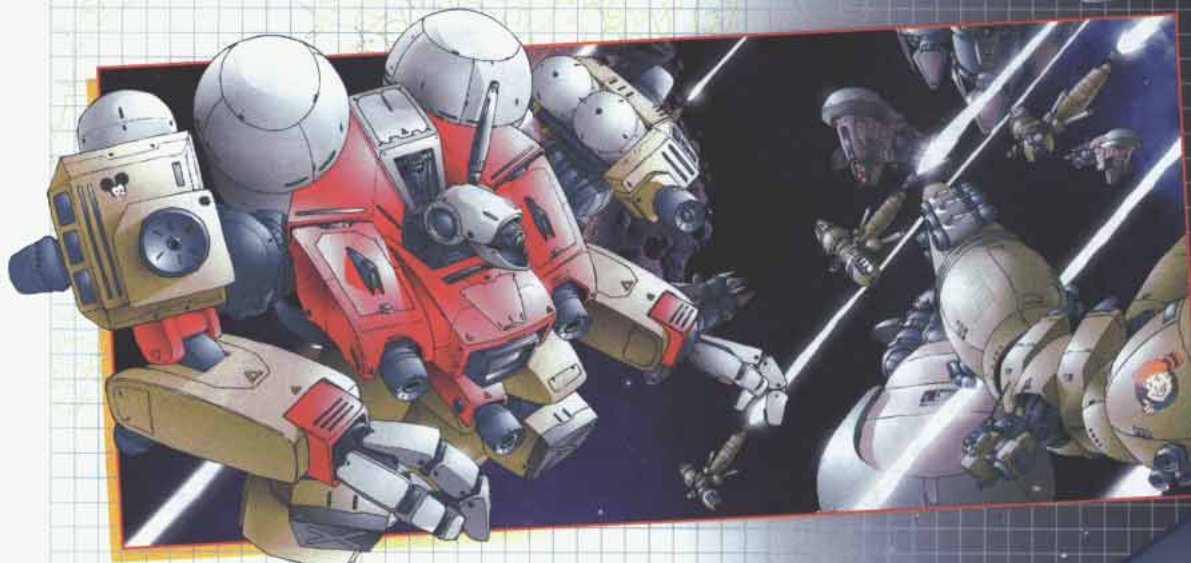
Much of the Free Republic territory is dotted with homesteads similar to this one. They are part of a vast network of terraforming stations that monitor and care for the genetically engineered crops that are slowly turning Mars into a fully habitable planet. Inflatable greenhouses protect the agricultural crop while large solar arrays strive to catch the thin rays of the distant Sun. It is possible to remain outside with only the protection of a pressure mask and some goggles, though long stays are not recommended due to the excessive amount of ultraviolet rays that are not filtered by the still-thin Martian atmosphere.





► THE FLYING MOUNTAINS

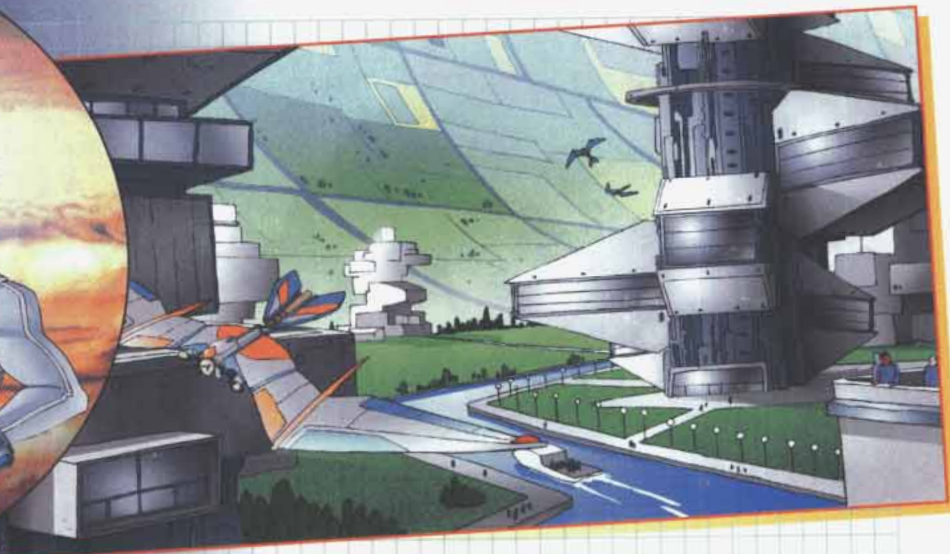
Living in the Asteroid Belt presents some advantages and disadvantages. On one hand, a great variety of materials and resources are readily available, if scattered around. On the other, energy is not. To accommodate the settlement's needs, Nomad technicians will often link different types of small asteroids together with lightweight structures to prevent them from drifting away, thus making sure there are plenty of construction materials nearby. S-type asteroids supply building material for the energy-gathering solar arrays, while C-type asteroids provide the water and organic matter required for agriculture. The latter are often immediately covered with very thin aluminized films to prevent evaporation from exposure to sunlight. Once the solar arrays are in place and a water source secured, the next project of the community will generally be a gravity wheel. Minerals and other resources are methodically extracted so that the cavities left behind by the mining equipment can be easily sealed and used as additional living space. The settlement in the picture has a large solar smelter built on the side of the core asteroid; it uses light reflected by large mirrors floating nearby.



► PEBBLES IN THE SKY

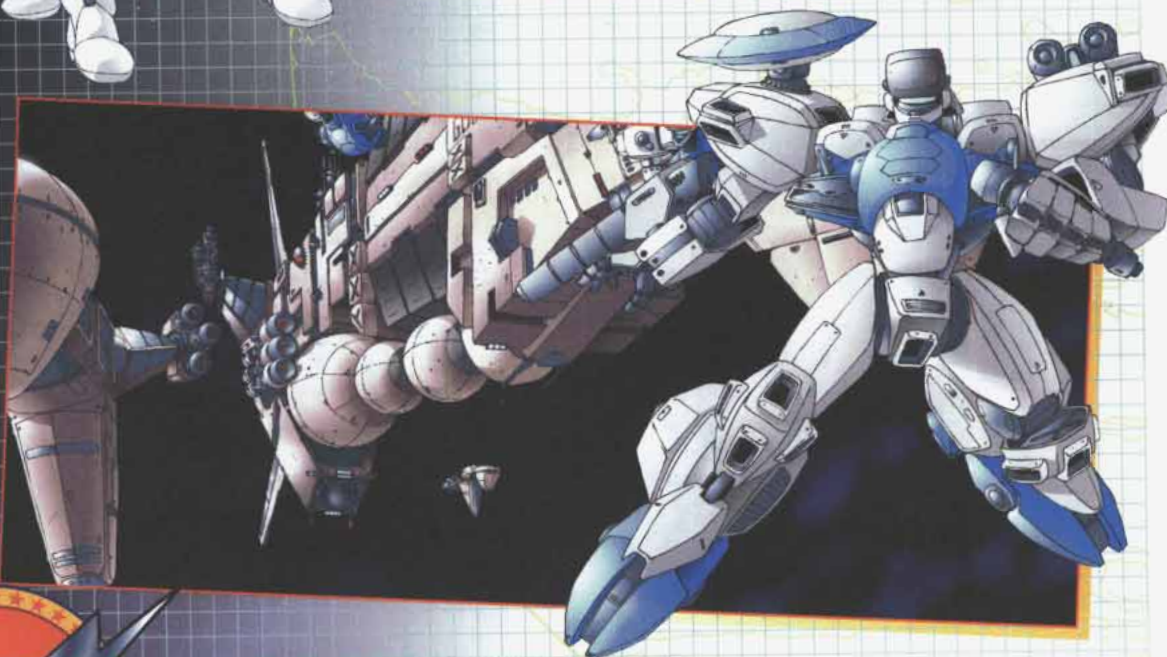
Defense is generally not a problem for Nomad communities. The Belt is so vast that they can effectively hide from all but the most dedicated of invaders. They have little that the nations of the solar system would want, anyway, since the amount of minerals and volatiles that are freely available is far larger than the needs of the entire human race. Still, well-established communities can be tempting targets for other, down-on-their-luck tribes or military units. The wealthier settlements are known to field ancient exo-armors, such as the Jovian-built *Hoplite*. While outclassed by modern vehicles, they present an effective deterrent and can do double duty as tugs.





▶ A SHELTERED PARADISE

Most space habitats in the Jovian Confederation are built on a closed frame to provide sufficient shielding against radiation and high energy cosmic rays. The sunline that runs along the middle of the habitat provides both illumination and heat through large banks of projectors whose power comes from the large field array mounted on the exterior of each station. The spacious interior of the sunline is filled with access tunnels and light zero-gee industries. This particular cylinder houses agricultural as well as residential areas. Genetically engineered farm animals have lower living space requirements but supply the same amount of milk. Light electric flyers are a popular form of entertainment. The presence of the sunline means there is no room for typical low gravity human-powered flight, and electric turbofans are required to provide the necessary power to fly closer to the ground.



▶ THE MIGHT OF JUPITER

The Confederacy has a large space fleet that serves both as a deterrent to attack and as a coast guard unit. Broken down into flexible combat groups, it operates on vast circuits that crisscross Jovian space. The vast physical territory claimed by the Jovian nation means that the fleet is always stretched thin, and spaceships can spend months away from their home base. Each of the three Divisions maintains a network of space docks and refueling stations that maintain the sharpness of the Jovian Armed Force. The largest of these is the JAF headquarters, Khannan Station, which is located within the Olympus cluster, but there are many others floating about.



DIPLOMATIC RELATIONS ◀

Formal intersettlement diplomatic relations, once rare in the chaotic years of the space colonization process, have made a definite comeback in the past forty years. Cynics would point out that they are only yet another arena for the various political conflicts of the solar system's governments. Indeed, the Odyssey and its aftermath have gone a long way toward polarizing the solar system between the Jovian Confederation and CEGA. The other powers, however, each have their own agenda that they pursue within 2210's increasingly tense political climate.

MERCURY ▼

The Mercurians currently have neutral or good diplomatic relations with most governments in the solar system. They historically have greatly dislike the Venusian people, but they are good buyers and the Merchant Guild can rarely resist a sale. The fact that they handle many of the money transfers for commercial transactions also forces the Mercurians to hide their true feelings.



4.15.1

They hold a neutral, but watchful attitude toward CEGA. The Earth system is a good customer since it has many needs. Nevertheless, the Mercurians remain careful, making sure to cover their tracks. Both Martian nations are occasional customers. The Mercurians may not like their prudish customs, but they will deal with them. The Jovian Confederation is so far away from Mercury that they don't have that many dealing with them. But they often have interesting item to sell.

VENUS ▼

Most people are suspicious of the Venusians' web of influence, but the corporations are careful to maintain good public relations with the rest of the human worlds. The only exception is Mercury, who the Venusians consider beneath them. Though it is distasteful to admit, the Mercurians and their Merchant Guild are an effective business tool, however.



4.15.2

Most of the Venusian ruling council members prefer to treat the Earth as a potential business partner, without being too friendly. Only a privileged few known about the machinations that allows them to control several facets of the CEGA government. As for Mars, the Federation is a good client. The Free Republic is seen as little more than a bunch of farmers, not worthy of attention. Jupiter is more of a problem. Though Jovians are openly friendly and helpful, the Venusians are wary that something is hiding under the smiling facade. The Jovians are definitely people to watch out for.

CEGA ▼

The government of the Earth system tries to maintain cordial relations with everyone, at least until they find themselves in a position of power. They currently enjoy neutral but good relations with the settlements of Mercury, as they often have need of the Merchant Guild's ships. As for Venus, many in the Council are unaware of the role played by the Venusian corporations in their dealings and have a somewhat paternalistic attitude toward the sister planet.



4.15.3

The CEGA council currently supports the Martian Federation, which it considers a valuable client-state. CEGA leaders have at least some affinity with Federated culture, unlike their Republican neighbors. Far-away Jupiter, however, is the current thorn in CEGA's side. The cold war between the two governments is a major source of tension, and more than one skirmish has flared in the depths of space.

MARS ▼

Both the Martian Federation and the Free Republic are on good terms with Mercury. Though they dislike and are wary of the financial might of Venus, neither Martian nation has reasons to be on bad terms with the economic powerhouse. The Federation is an informal ally of CEGA and are cleared to buy surplus military equipment from them. The Free Republic is on closer terms with the Jovian Confederation and constantly worries over the tight relations between the Federation and CEGA.



4.15.4

Relations with Earth and Jupiter seem only to be accelerating conflict on the Red Planet. Every time the Federation buys weapons from CEGA, the Free Republic announced negotiations for joint Belt patrol forces with the JAF. This, of course, leads to the Federation getting closer to CEGA, and so on.

JOVIAN CONFEDERATION ▼

The Confederation is carefully neutral toward Mercury and the Merchant Guild. There has been some warming up recently since the Jovians defended a Guild-affiliated ship from a CEGA attack. The Confederation is much more worried about the Venusians, and are suspicious of their activities. It has too many economic links with them (and not enough proof), however, to act on mere suspicions.



4.15.5

The Confederation is currently in a state of cold war with CEGA. The Agora sees the government of the Earth system as a very real threat and act accordingly in all its dealings with the Earth sphere. As for Mars, the Jovians currently maintain friendly relations with the Free Republic. The Federation is tolerated, but there are no formal diplomatic relations.

ADVANCED RULES



▶ ADVANCED RULES

Chapter Five contains numerous advanced rules that covers specific situations that may occurs during Jovian Chronicles campaigns. The chapter is divided into four parts. The first one deals with rules that are directly related to the characters, such as zero-gravity movement or disease rules. They are more detailed than called for by most gamemasters, but should prove useful if the characters' lives suddenly hinge on a crucial detail (such as the rate of pressure loss in their cabin).

The second section covers vehicles and their applications. It supplies rules and guidelines for special maneuvers and applications as varied as acrobatic maneuvers to fuel skimming. Like the advanced character rules, their use is entirely optional and subject to the approval of the rest of the playing group.

The third section offers guidelines on how to use the various terrains and environments of the Solar System in your campaign. This is a much more detailed complement to the *Terrain Effects* section on page 144 of the rulebook. Although prepared with the vehicle combat rules in mind, the terrain effects described there can also be used for roleplaying purposes.

Finally, the last section explains how to abstract human beings when a large number of them are involved, either for crowd scenes, infantry assaults or boarding actions. The game statistics for a sample assault pod, used for boarding operations, are supplied at the end of the chapter.





► ADVANCED ROLEPLAYING RULES

The following texts introduce detailed rules about situations that will affect the characters' lives in important ways. These are new or more detailed versions of the basic rules found in the rulebook and should be used only when additional detail is required to avoid slowing down gameplay. They should only be used in specific situations since they bring additional (and, in most cases, unnecessary) bookkeeping.

▼ ADDICTION RULES

The main negative side effect of drugs (recreational or medical) is the dependency it often creates in frequent users. This dependency can greatly affect one's quality of life, social relationship and health. It also makes for great drama. The medical field divides drug addictions in two broad categories: psychological *dependence* and physiological *addiction*. For the sake of simplicity, these rules use the terms "dependence" and "addiction" to represent the psychological and physiological aspects of drug addiction, respectively.

A little disclaimer: these rules are for use in realistic roleplaying simulations. The use of recreational drugs by *Players* is **not** condoned in any way! Please do not reality-check these rules...

◇ DEPENDENCE

Dependency exists when a character is compelled to take a drug to satisfy a mental or emotional craving for the drug. The user is addicted to the pleasurable effects of the drug, even though the intensity of effect may have waned since it was first consumed due to drug tolerance development. Most recreational drugs eventually create psychological dependence, hallucinogens being a notable exception.

While primarily psychological, *dependence* is not necessarily easier to get rid of than physiological addiction, for it is often more insidious, based on regular habit and social conditions (peer pressure, etc.). In the case of legal drugs (i.e. alcohol, tobacco, etc.), recovery can be particularly difficult since social influences can make the addiction more acceptable.

Whenever the dependent character is presented with an opportunity to take the drug, he must make a WIL roll against the Dependence Value of the drug in order to pass up without taking penalties. If the character fails, he can still pass up, but the mental stress will give him a general action penalty, the severity of which depends on the Margin of Failure on the WIL roll. For a Margin of 1 to 4, the penalty is -1; 5 to 9, -2; and for 10 or more, the penalty is -3. Treat a Fumble as a failure of 10+. The penalty decreases by 1 for each hour, though the craving will remain: if the drug is once again presented, the character must make another roll, and so on.

If, in going cold turkey, a character consecutively succeeds a number of WIL rolls equal to the drug's Dependence Value, he can consider himself partially cured from the addiction: he gets a +3 bonus for all subsequent WIL rolls, *until* he fails. Failure means the character has fallen back into the habit, and must start the detoxification process again. Treat a Fumble as a temporary relapse: the character goes on a binge, then makes a WIL roll afterwards; a failure on this roll means the character has become dependent again, otherwise he still keeps his +3 bonus.

True liberation from psychological *dependence* is left to the GM's discretion, though we suggest at least a full year of abstinence before a character is totally free from the drug.

◇ ADDICTION

In contrast to psychological dependence, addiction (physiological dependence) is said to exist when one must continue to use the drug in order to avoid *withdrawal illness*, a series of physiological disorders caused by cutting the addict's regular drug intake. Addiction is a frequent problem with sedatives and some euphorants, such as alcohol. It is also a problem (usually to a lesser degree) with some stimulants and analgesics. Drugs that cause physiological addiction usually create psychological dependence, though not always (as in some medical drugs).

The severity and nature of withdrawal symptoms varies from drug to drug. For simplicity's sake, we've grouped them under one umbrella, but feel free to describe slightly different effects depending on the character's drug of choice. Withdrawal from sedatives and euphorants can cause tremors, fever, *convulsion*, vomiting, cramps, diarrhea and severe pain; going cold turkey on stimulants might provoke excess fatigue, disorientation, pathological irritability and severe depression.

Whenever a character misses a daily dose, he must make a HEA roll vs. the drug's Addiction Value. On a successful roll, the character experiences few side effects, but must roll again the next day, and so on, until he's consecutively succeeded in a number of rolls equal to the drug's Addiction Value. In such a case, he is no longer considered as "addicted" to the drug, though he can still be "dependent" on it, as per the rules on psychological dependence, above.

In the case of a failure, a MoF between 1 and 4 will give a corresponding penalty (-1 to -4) on all the character's rolls, as he suffers from the shakes, fever, nausea, etc. The penalty decreases by 1 for each day of rest. These symptoms disappear if the drug is taken, although this resets the withdrawal period. A Margin of Failure of 5 to 8 incapacitates the character for a number of days equal to the MoF minus 4. After that treat as if the character had obtained a MoF of 4.

▷ ADDICTION CONTINUED

A failure by 9 or more (or a Fumble) causes life-threatening bouts of fever or convulsions for a number of days equal to the MoF minus 8 (or 1 day for a Fumble). The character has a 1 in 6 chance of dying every day, 1 in 3 if not under medical attention. After this, treat as if character had failed by a Margin of 8.

In any case, a character who survives his attempt at cold turkey gains a +1 bonus in resisting the further effects of withdrawal. This bonus is cumulative, so repeated withdrawal attempts will usually free the character from physiological addiction (but not psychological dependence — that's another story).

BECOMING DEPENDENT ◇

These rules do not cover the process by which a character becomes addicted to a drug — the details of which greatly vary from drug to drug and from person to person. Most of all, this system deals with the constraints on characters already dependent on a drug. A few guidelines are provided for GMs who want to introduce addiction in a campaign.

A drug's description should give the relative addiction's "onset time" (called interval), from a few doses to a few years of continual use (intervals are given separately for dependence and addiction). The interval is rarely fixed, normally varying by a factor of one to two (GM's discretion). "Continual use" means usage at least once a day, every day, in quantities large enough to cause intoxication; "occasional use" means usage at least once a week, in quantities large enough to cause intoxication.

The interval is accompanied by a threshold against which the character must make a PSY or HEA roll (depending on the kind of addiction). The roll should be made periodically, every time the interval comes up. Failure means the character is dependent/addicted. For obvious reasons, Fatal Toxins do not have addictive qualities.

MEDICALLY ASSISTED WITHDRAWAL ◇

Medical institutions can help characters suffering from withdrawal by giving them a bonus of +1 to +4 (depending on the technology level of the world and institution) on the HEA rolls, as well as making sure that a patient will have better chance of surviving the severe withdrawal illness.

Counselling groups, psychological treatment and the like can help characters get rid of dependence, but the highest bonus they can usually provide is +2, and that's with constant therapeutic attention.

SAMPLE DRUGS ◇

Alcohol: Sedative/Euphoric/Analgesic; Potency 6; Onset Time 15 minutes; Dependence Value 5; Dependence Interval 2-4 weeks continual use, 2-4 years occasional use; PSY Threshold 3; Addiction Value 8; Addiction Interval 3-6 weeks continual use, 3-6 years occasional use; HEA Threshold 3.

PCP: Hallucinogen/Stimulant/Analgesic; Potency 12; Onset Time 30 minutes; Dependence Value 3; Dependence Interval 5 to 10 uses; PSY Threshold 3; Addiction Value 7; Addiction Interval 10 to 20 uses; HEA Threshold 5.

Cannabis: Euphoric; Potency 6; Onset Time 2 minutes; Dependence Value 4; Dependence Interval 3-6 weeks continual use, 2-4 years occasional use; PSY Threshold 4.

Barbiturates: Sedative/Euphoric; Potency 10; Onset Time 20 minutes; Dependence Value 6; Dependence Interval 1-2 weeks continual use, 4-8 months occasional use; PSY Threshold 5; Addiction Value 7; Addiction Interval 2-4 weeks continual use, 4-8 months occasional use; HEA Threshold 7.

DRUG ADDICTION EXAMPLE ◇

A soldier stationed in one of the most boring military stations in the Belt, Al spends most of his time playing cards with his pals while popping barbiturates. He does this every week, so the Gamemaster decides that after 6 months he must make both PSY and HEA rolls, vs. thresholds of 5 and 7, respectively. He fails both rolls and becomes dependent and addicted.

Realizing that he has a problem (his superiors are becoming suspicious), Al tries to reduce his habit. The next card game, he refuses to take the drug. He must make a WIL roll (he has a WIL of +1) against the Dependence Value, 6. He succeeds, and suffers no action penalty. If he keeps on refusing offers and successfully makes his roll 6 times in a row, he will receive a +3 bonus to all further WIL roll for resisting the effects of psychological dependence.

Before he can achieve that, though, he must check for the physiological effects of drug withdrawal and make a HEA roll against the drug's Addiction Value of 7. He rolls a 4 and misses by 3. Al becomes seriously ill (-3 to all his actions), which tips off his superior officers. After he has spent a few days in the infirmary, they confront him with his addiction. He agrees to go into detox. The sick bay is adequately equipped to deal with drug addiction and gives a +2 bonus for HEA rolls and a +1 bonus to PSY rolls. If Al can survive his cold turkey he will not have any more physiological need for barbiturates, though the psychological risk may linger for a few months.

▼ ATMOSPHERE

The contents and pressure of the artificial atmosphere are crucial in space — if either is improperly monitored and controlled, people can and will die. Obviously, lack of oxygen is detrimental to the continuation of human life. There can be several causes to oxygen deficiency: an excess of carbon dioxide in the atmosphere, defective air reserve or decompression. If the air supply is compromised, characters suffer while their bodies try to make do with insufficient resources.

◇ OXYGEN

If the atmosphere degrades due to lack of clean air, characters will suffer from physical and mental penalties. Penalties start ten minutes after fresh oxygen is last supplied. Characters receive a -1 penalty to all mental Attributes (CRE, INF, KNO, PER, PSY, WIL) because their concentration decreases due to lack of oxygen. All mental Attributes drop at a rate of -1 per two minutes. All characters in the location must make a Fitness roll against a Threshold of four to avoid unconsciousness, with the mental Attribute penalty as a modifier. In Cinematic campaigns, the Player can choose to use WIL if it is higher than FIT.

Twenty minutes after fresh oxygen is last introduced, the character automatically loses consciousness. A random mental Attribute drops by one every turn. If any of them reaches -5, the character dies.

This rule assumes a normal oxygen content of 20%. If the oxygen content of the air is higher or lower, the durations are multiplied accordingly (e.g. twice as much oxygen means Attributes drop every four minutes instead of every two).

◇ PRESSURE

A loss of pressure means that although the atmosphere has the proper oxygen content, there is not enough of it or not enough pressure to force the oxygen into the bloodstream. Loss of pressure can come from several sources, from a faulty regulator to a leak or hole in the hull of the spacecraft.

The Atmosphere Loss table shows the average amount of time it takes for the pressure to completely degrade in a given location. At each stage of decompression (three-quarter pressure, half, quarter) all characters in the location must make a Fitness roll to avoid unconsciousness, with a penalty of -1 to the roll for each level of degradation. They also suffer from the effect of lack of oxygen (-1 to all Mental Attributes per stage). If the pressure drops a quarter normal or less, the character suffers the same effects as if there were no oxygen, according to the Oxygen section.

◇ LOSING PRESSURE

There are two ways to lose pressure: slowly, through a leak, and all at once, through explosive decompression. The latter is much more dangerous since the body does not have time to adjust and often reacts very badly (see *Exposure to Vacuum*). Otherwise, the effects described in the Pressure paragraph above happens.

The table below gives Armor ratings and volumes for typical locations; these can be modified by the Gamemaster by up to 50% depending on his requirements. The Armor rating shows how many damage points the walls have. This is listed in Personal Damage Scale (see page 126 of the rulebook). Doors generally have lighter effective Armor because of their opening mechanisms, and structural bulkheads are much tougher. If the damage exceeds the Armor, a one-centimeter hole is made (for simplicity, assume the hole is roughly square). The dimension increases by one centimeter for every additional time the Armor is exceeded by (for example, 35 points of damage, applied to an Armor 10 wall, will cause a 3 centimeters wide hole, or 9 cm²). If desired by the Gamemaster, these rules can also apply to spacecraft and spacesuits.

□ PRESSURIZED AREA INFORMATION

Location	Wall Armor	Door Armor	Bulkhead Armor	Volume [m ³]
Airlock	15	15	20	20
Room	15	10	25	200
Hangar	20	20	40	5000
Colony	500	350	1000	4 x 10 ¹¹
► Atmosphere Loss				
Hole Size/Location	Airlock	Room	Hangar	Colony
Leak-Sized (1 cm ²)	1 day	4 days	12 days	300 years
Fist-Sized (100 cm ²)	2 turns	8 turns	24 turns	100 years
Man-Sized (1 m ²)	1 turn	4 turns	12 turns	20 years
Vehicle-Sized (100 m ²)	Instant	2 turns	8 turns	1 day
Ship-Sized (1000 m ²)	Instant	Instant	1 turn	1 hour

Hole is the approximate size of the air evacuation duct or hole;

Location is the approximate comparative volume of the pressurized area.

EXPOSURE TO VACUUM ◇

Contrary to popular belief, exposure to vacuum does not kill instantly. An unprotected human can survive up to three minutes before his brain dies from oxygen starvation, though there are some severe side effects from other sources. First, the lack of pressure on the body will cause any internal gases to try and escape. Capillaries close to the skin will burst, resulting in one giant bruise across the entire body (one automatic Flesh wound per minute). If the person tries to hold his breath, severe damage will result to the lung and inner body membranes (automatic Deep Wound). If possible, it is better to try and hyperventilate to charge the blood with oxygen, then exhale as vacuum is entered.

The second major side effect comes from the temperature. Space is cold, except where a celestial body can provide heat. In the case of the solar system, this would be the Sun. A person exposed to vacuum will thus be roasted on the Sun-facing side while freezing on the other. In general, burns will be the least of a survivor's worries, but a Flesh wound is generally the result of more than one minute of direct space exposure.

For game purposes, a character can remain conscious for a number of 6-second turns equal to twelve plus his Fitness Attribute. In Cinematic campaigns, the Player can add the character's WIL to his FIT. After this period is elapsed, the character automatically loses consciousness. A random mental Attribute drops by one every turn. If any of them reaches -5, the character dies.

DISEASES ▼

There are very few parasites and harmful microorganisms in space habitats. Strict custom and quarantine procedures make sure that incoming visitors or new settlers do not bring in any unwanted companions. Unfortunately, quarantines are not 100% effective. Should these procedures fail, it is possible (but expensive) to sterilize whole habitat by simply evacuating the inhabitants and concentrating solar rays upon it to heat it up. Even in the twenty-third century, diseases are still Mankind's lot.

Diseases and illnesses are rated by contagiousness, onset time, virulence and effect. The contagiousness of an illness is the threshold number of a Health test that must be rolled when the character comes into contact with it. This roll can be modified by the GM to represent good or poor hygienic conditions (usually between -3 and +3). A successful roll means that the character does not contract the illness. A failed roll indicates that the character contracts the illness. The amount that the character fails the contagion roll by is added to the illness' virulence for that character. A fumbled contagion roll results in the character contracting the illness at double the normal virulence. The onset time of an illness is similar to the onset time of a toxin. It represents the longest incubation period for the illness. The actual time until the effect of the illness occurs is equal to the onset time divided by the Margin of Failure of the contagion Health test. Fumbled contagion tests produce an onset time equal to one tenth the normal value.

Once a character contracts an illness and the onset time has expired, he must make a second standard Health test against a target number equal to the illness' virulence rating. Keep in mind that the virulence rating is augmented by the amount that the contagion test failed by (double for fumbles). A successful Health test indicates that the character rides out the illness with minimal effects. A failed Health test indicates dangerous complications. A fumbled Health test is often fatal (Gamemaster's discretion). Each illness description should document the effects of all three results.

GRAVITY ▼

What is casually referred to as gravity is in fact a constant acceleration applied to the body by the gravitational field of a large mass. There is no practical difference between the acceleration provided by a gravity field and other types of accelerations, as demonstrated by the famous "elevator experiment" (refer to any basic physics textbook). Gravity is easily simulated in space by firing thrusters or rotating a living section, thereby creating centrifuge acceleration.

The following rules apply to zero-gee conditions, which should more accurately be called free fall. Indeed, all objects in the solar system are subject to the gravitic pull of the Sun, and only the orbital speed prevents them from falling on the surface of the star. Everything is, in effect, perpetually falling.

SPACE ADAPTATION SYNDROME (SAS) ◇

The first astronauts reported the presence of a strange kind of sickness that affected them when they reached orbit. They would feel sick and nauseous, with any sudden motion making all other symptoms worse. It was soon discovered that more than half of the people going into space would suffer from what was termed the Space Adaptation Syndrome: the inability of the body to conciliate the various sensory signals received. There is no way to predict who will be affected and for how long, though certain exercises and chemical compounds have been developed to help the transition.

When the character first enter micro-gravity conditions, two die should be rolled. If he has received either motion training or drugs, add a +1 to the die roll (+2 if both are used). On a five or more, the character is completely immune to the SAS effects. Otherwise, the character suffers from an action penalty equal to five minus the roll of the dice. A HEA roll versus five is made at the end of every day to see if the character recovers. Once recovered, the character is fine and gains a +1 to further SAS rolls. A few people are incapable of adapting and are perpetually ill in free fall (see *Character Flaw*, page 27).



◇ MOVING IN LOW GRAVITY

Movement under low gravity conditions (between 1 and 0.1 gee) is similar to standard movement. The exception is, obviously, that the person will be able to take much greater leaps and will have a harder time controlling the direction of the movement due to the reduced traction. A penalty of -1 is applied to all movement-related Agility tests. Movement rates are divided by the local gravity (in gee). Falling damage is multiplied by the local gravity (in gee).

Thus, an average person (FIT 0, no Athletic Skill) would be able to jog up to $(12 \div 0.16 =)$ 75 meters per round on the Moon, though he would do so in great bounding leaps and would have trouble controlling his direction. Should he fall, though, he would receive only one sixth of the normal falling damage.

◇ MOVEMENT IN FREE FALL

Moving in space is a totally different experience than moving under gravity. Mass in space keep their inertia at all times, meaning that no effort need be expended to move except when changing direction or velocity. Inertia also has unfortunate side effects, such as the impossibility to change direction in mid-air.

The speed that can be reached by a person is directly related to the strength. The stronger the person, the greater the initial impulsion can be. Obviously, characters can chose to move slower, if so wished. If pushing objects, or carrying them, multiply speed by basic body mass, then divide by new mass. One must not forget that action equals reaction of equal value: if someone pushes off another person, both will float away, not just the one who gets pushed.

□ FREE FALL MOVEMENT SPEED

•	Maximum Speed (m/s) = square root of $(M_{gm} \times 4) / M_{bd}$
•	M_{gm} is the maximum mass lifted by the character in one gee (see rulebook, p.67).
•	M_{bd} is the character's body mass (see rulebook, p.64).

◇ COLLISIONS

Collisions are the main danger in micro-gravity movement. Since there is no way to change direction or velocity without some kind of reaction, unexperienced freefallers often collide with objects in their path, powerless to prevent the collision. This can result in bruises and even broken bones. In the most extreme cases, collisions can kill.

Two dice are rolled and the result multiplied by the speed, in meter/second, of impact. This is the damage taken by the individual. If the floating person was purposefully launched in a manner that would cause him to impact head first, add ten to the die roll. A conscious person may attempt to soften the reception. To do so, the character must roll a Zero-G Movement Skill test. The number rolled is subtracted from the speed for the purpose of damage calculations. If the number rolled is equal to or greater than the actual speed, the person "lands" unharmed. If the roll fumbles, the person hits head first and takes the extra damage associated (+10 to the die roll). If the character does not manage to land, he will rebound from the collision and float away — assume half his pre-collision speed for simplicity.

Base damage assumes that a moderately solid surface will be impacted. Unusually hard surfaces, such as armor, can double the effective speed for damage and rebound speed purposes. Soft surfaces such as rubber halve the effective speed. Special crash pads or nets can divide the collision speed by up to ten to twenty times (Gamemaster's decision).

◇ COMBAT

Personal combat in space is mostly of the hand-to-hand type. The limited confines of many habitats mean there is little room to use ranged weapons. Moreover, the extreme danger caused by strait shots hitting the life supporting bulkheads and recycling systems is too great to ignore.

Ranged weapon fire is possible, though the recoil must be taken into account by the user. For this reason, nearly recoilless weaponry such as gyroguns and lasers are preferred. Many weapons have recoil and will push back the user at a certain velocity unless he is braced. In space combat, an acceleration equal to 0.01 g (0.1 MP) is applied *opposite* the firing direction per point of Damage Multiplier (to translate this into meter/second speed, simply divide the MP value by ten — a good enough approximation).

Close combat should use the normal rules, except that any hit will cause the combatants to fly apart unless they are braced. Use the above rules to calculate kickback speeds, remembering that both combatants are pushed in opposite directions.

◇ GRAVITY AND HEALTH

Zero and micro-gravity conditions cause a variety of health problems. The human body has been designed to function under gravity, and while removing it does confer some short-term benefit, complications will occur in the long run.

▷ GRAVITY AND HEALTH CONTINUED

Bone decalcification, whereas the calcium literally "oozes" out of the skeleton, occurs after a few weeks of zero-gravity. Certain compounds have been developed to help fix calcium into the bones to alleviate the problem. Taken with calcium supplements, they are generally enough to take care of the problem. Since the compounds are mass produced, the cost is negligible and they are available practically anywhere.

Loss of muscle tone is a more common and serious problem. Regular exercise sessions and visits to the centrifuge are recommended to prevent it. Electrical stimulators are also available; these are often used by Nomads or other spacefarers who generally don't have the time or the living space for a complete exercise regimen. If this is not taken care of, health problems can occur and the person will soon be incapable of tolerating acceleration or visiting other worlds.

In game terms, one point of FIT is lost on the first month spent without exercising. Another is lost after two months, another at four months, and so on, doubling the interval every time. At least two hours per day of vigorous exercises are required to avoid this effect, increasing by one hour every three months spent in free fall until it reaches a maximum of six hours per day. One point of BLD is lost per two points of FIT, and both HEA and STR are recalculated to take any losses into account.

MICROGRAVITY PROCEDURES AND CUSTOMS ◇

The physical requirements and limitations of the free-fall environment have forced the adoption of a set of specific procedures designed to facilitate and safeguard the lives of people living in space. Most of them are fairly simple and have long since been incorporated into space-borne cultures.

One of the oldest rules is that loose liquid, crumbs and smoke are unwelcome in free fall. These float into the air conditioning system and foul it up, and can make breathing difficult or even hazardous as loose particles are absorbed into the lungs. Hair should be worn short or attached. Loose clothes or jewelry can become entangled and so are normally shunned. Pockets, belts and Velcro straps are popular for attaching all sort of stuff. There are few nudity taboos, especially in the Nomad settlements, but it is considered rude to go about undressed elsewhere than in one own's personal quarters.

All corridors are normally lined with two strips of bright colors, usually blue and red, with arrows on them. Traffic should attempt to remain nearby the strip indicating their direction. All markings, such as shipboard indications, warning labels, etc. are usually marked twice, 180 degrees from one another. They can thus be easily read regardless of orientation. Each compartment generally also bear its volume and rad shielding factor on the wall near the doors and hatches.

People are normally encouraged to keep one hand on a handrail or other fixed object at all time, or else be tethered. Remember that the vector can't be changed without pushing against something. Large gestures are discouraged in space. Flailing around might send you flying off, or you might hurt a passing fellow spacer. Regardless of the location, ship, hangar, station, etc., people on duty, such as crewmembers, have right of way in corridors and access shafts. They may need to get somewhere fast to respond to an emergency.

RADIATION ▼

If only for the nearest star, every character is constantly subjected to subatomic bombardment — radiation — though temporary and permanent damage is rare. Such circumstances usually involve nuclear power (reactors, plants, bombs) or space travel (cosmic rays, solar flares, etc.). The results are usually pretty ugly, even though it often takes a few days or weeks before the silent killer completes its work.

Like the rest of the game system, the radiation rules are a compromise between simplicity and realism; some scientific accuracy has been set aside to make them more playable. This was especially necessary in dealing with such an insidious ailment as radiation poisoning, whose effects on the human body are more complex than the average gamer cares to include in his game.

RADS ◇

One rad (Roentgen Absorbed Dose) is the effect of one roentgen — the standard unit for measuring radiation — on a living organism. Absorbed rads are cumulative: a tally of the character's current irradiation level must be kept. These rads are included in effect calculation until they are eliminated by the organism, which can take quite some time. Every week, a character can purge a number of rads equal to the amount given by a Health roll, as long as he was not further exposed to radiation during that period. A character can never fully purge them out and will always retain a number of rads equal to one-tenth the largest number ever accumulated.

The table on the following page gives sample rad contamination values from various sources. The values are either absolute numbers, for one-shot radiation bursts, or rates, for prolonged exposure. Some sources have unpredictable radiation emissions and thus have a randomly determined rad contamination value. Where 1d6 is indicated, roll one die and multiply by the given value. Where 1d3 is indicated, follow the same procedure but divide the die result in half, rounding up.



▣ SAMPLE RADIATION LEVELS

Radiation Source	Radiation Level
1-kiloton air burst at 1 km	100 rads
1-megaton air burst at 2 km	6,000 rads
1-megaton air burst at 10 km	500 rads
1-megaton air burst at 25 km	100 rads
Neutron bomb air burst at 3 km	500 rads
Fallout at ground zero, 1-megaton ground burst	
after 1 hour	1d6 rads/minute
after 2 hours	1d3 rads/minute
after 6 hours	1d6 x 5 rads/hour
after 1 day	1d6 rads/hour
Nuclear Reactor Meltdown	1d6 x 10 rads/minute
Solar Flare	1d6 x 5 rads/minute
Background Cosmic Rays	1d6 x 0.001 rads/hour

◇ PROTECTIVE EQUIPMENT

Lead and NBC suits protect against radiation and radioactive fallout. Anti-radiation suits are given a Radiation Shielding Factor (RSF) in rads/hour. This amount is subtracted from individual bursts or from hourly rad rates for prolonged exposure. This value is divided by 60 to get the protection in rad per minute.

Protection can also be derived from a large mass, which will absorb most of the energy of the radiation. Water is one of the best radiation shield there is, but other inert material, such as rock, also provide respectable protection if there is enough of it. Non-shielded vehicles provide a basic amount of protection equal to their Armor rating squared, in millirads (0.001 rad) per minute. Buildings, constructs and large natural objects follow the same formula, but double their Structure points before squaring (see the table below for the amount of Structure points per thickness).

In addition, many vehicles are equipped with screen generators, devices that absorb or deflect incoming radiation. This is noted as the Perk HEP: Radiation in their statistics. The rad protection level, in rads/hour, is equal to ten to the power of the rating of the system (e.g., a rating 3 system would give 10^3 rads/hour of protection). In addition, all spacecraft with this Perk (regardless of the Rating) automatically get one or more "storm shelters" designed to protect the crew from radiation too strong even for the screen generators. The crew may not do anything while in the storm shelter, however.

▣ RADIATION PROTECTION

Type	Radiation Shielding Factor (RSF)
NBC Suit	5 rads/hour
Flight Suit	0.1 rads/hour
Space Suit	5 rads/hour
Rad Suit	10 rads/hour
Personal Screen Generator (requires a space suit)	1000 rads/hour
Heavy Screen Generator (requires a space suit, -1 Encumbrance)	10,000 rads/hour
Water (one centimeter)	Equivalent to 25 points of Structure
Rock (one centimeter)	Equivalent to 15 points of Structure
Metal (one centimeter)*	Equivalent to 15 points of Structure

*Powerful radiations cause secondary cascade effects in metal if the thickness of the shielding is insufficient. If the total RSF is lower than half the incoming radiation, it is ignored and the radiation level is doubled.

◇ RADIATION EFFECTS

The first time a character's accumulated rads exceed 50, or at any time the character receives at least 1 rad thereafter, secretly roll his or her Health against a threshold set by the Irradiation Table, below. Do not roll more than once a day and do not apply more than one effect at a time (pick the worst). The Gamemaster should not tell the player the result of the roll, but rather describe the symptoms as they manifest themselves.

If the character succeeds the roll, he is totally unaffected by the radiation, though his level of accumulated rads stays the same. Failed rolls have a variety of effects, as detailed below. On a fumbled roll, apply the corresponding Fumble effect as dictated by the table, then the normal failure effects. Make a further Health roll in the case of a fumble: the result gives the number of minutes before the effect takes place.

IRRADIATION TABLE

Rads	Threshold	Fumble Effect
50-99	6	None
100-199	7	Flesh Wound
200-299	8	Flesh Wound
300-399	9	Flesh Wound
400-499	10	Flesh Wound
500-599	11	Deep Wound
600-699	12	Deep Wound
700-799	13	Deep Wound
800-899	14	Deep Wound
900-999	15	Deep+Flesh wounds
1000-1099	16	Deep+Flesh wounds
1100+	17	death

The values on this table are higher than most studies have shown. This was done to both increase character survivability and take into account the fact that some parts of the body may escape irradiation, thus lowering the overall effects.

SHORT-TERM EFFECTS

A roll failed by 1 to 4 produces mild radiation sickness. Symptoms will appear in a number of hours equal to the result of a Health roll by the character. He will be fatigued and nauseous, incurring a action penalty equal to the Margin of Failure. Reduce the penalty by one every 12 hours. There are no other short and medium term effects, though later complications are possible; see *Long Term Effects* section below for more details.

A Margin of Failure between 5 and 7 will have effects similar to those of a mild radiation illness, described above, with a penalty of -4. Secondary symptoms will appear after a number of days equal to the character's Health roll: lingering fatigue, muscle pain, loss of hair. The character will be at -1 to all activity, except Health rolls which are at -2. The character must make a daily Health roll vs. 4 to recover from the sickness. Success means that the character completely recovers in 10 days, minus his or her System Shock rating (minimum of one day). A fumble will inflict a Flesh Wound on the character.

A Margin of Failure of 8 or 9 is similar to one between 5 and 7, described above, except that the secondary symptoms are more severe. The general action penalty is -2, -3 for Health rolls. A failure on the daily recovery roll will inflict a Flesh Wound, a Deep Wound in the case of a fumble.

A roll failed by 10 to 14 gives results similar to those detailed above, but graver still: the action penalty is -3, -4 for Health rolls. A failed recovery roll delivers a Deep Wound, while a fumble means that the character succumbed to the radiation. On a successful result roll again, with no penalties this time: a second success means that the character miraculously recovered, as explained above.

A roll failed 15 or more kills the character in a number of hours equal to a Health roll.

LONG TERM EFFECTS

The effects of radiation on human DNA are very subtle and it can take years before the full effects manifest themselves. People who have been subjected to large doses of radiation are more prone to develop cancers and other troubles in their later years. Other unpleasant legacies of radiation effects, such as sterility or offspring mutations, are left to the Gamemaster to use as plot devices.

To simulate the long term effects, the GM may decide to have a character who suffered from radiation sickness make a yearly Health roll against half the highest Margin of Failure he ever had in resisting the effects of radiation, rounded up. Failure means that the character has contracted a life-threatening cancer — which may or may not be detectable and treatable, depending on the timeframe and the style of the campaign.

TREATING RADIATION SICKNESS

Depending on the campaign's level of scientific development, it may or may not be possible to treat characters suffering from radiation poisoning. If treatment is available, it will probably come in two steps: recovery from the sickness proper, and accelerated purging of accumulated rads. Depending on the technology, a +1 to +4 bonus can be added on the recovery roll, and the purging rate may be multiplied by a factor of 2 to 8. If the character receives regular check-ups, the recovery bonus is applied for Long-Term Effects' Health rolls. Once again, depending on the location, the treatment may range from relatively cheap and commonly available to extremely expensive and rare.



▶ ADVANCED TACTICAL RULES

The following optional rules provide additional environments and strategies to the tactical game. Many of them are special case rules that apply only to some specific situations. Though they will slow down play a little, they can put new life into an old scenario by modifying overall parameters and circumstances. Some, or all of them may be used if (and only if) all of the Players agree to use them before the game.

▼ AIRCRAFT MANEUVERS

Aircraft can perform a variety of special maneuvers and operations due to the nature of their movement system. Obviously, aircraft and atmospheric maneuvers only work on worlds with a tangible atmosphere: Earth, Mars, Venus and Titan (gas giants have atmosphere, but no ground on which to land). Drop durations and altitude losses, where applicable, should be multiplied by the local gravitation, in gee (round up). The following rules apply to flying vehicles of all types.

◇ AEROBATICS

Rolls: an aircraft rolls when it rotate along its main axis. Rolling does not affect movement *per se*, but gives a +1 bonus to evade enemy fire and a -1 penalty for attacks. Its difficulty threshold is 4; on a failure roll on the Aircraft Control Loss Table. Rolling requires one action.

Loops: there are two kinds of Loops: a Full Loop and a Half Loop. In a Full Loop, the craft more or less ends the maneuver where it started, keeping relatively the same heading (an inverted Loop is the same as a regular Loop, but done in the direction of the ground). In a Half Loop, the craft keeps on going straight at the top of the Loop (or the bottom, for an inverted Loop). All Loops require one (half-loop) or two (full loop) actions. A pilot who fails his check must roll on the Aircraft Control Loss Table, adding 1 for a Half Loop, 2 for a Full Loop and 3 for any kind of inverted Loop.

The tightness of the Loop depends on how many Movement Points the Player spends. The minimum number of MPs is set by the turn radius times six; the difficulty of the maneuver is equal to the turn radius +1 (minimum 3; lighter-than-air craft cannot perform loopings). The movement ends in the same hex it started from, or any of the surrounding hexes. The craft can end up at the same altitude level or one above/below.

A Half Loop is similar, though the minimum number of MP is the turn radius times three. The threshold is the same as for a Full Loop. The craft ends its movement in either the hex it started from or any surrounding hex. Heading is changed by 180 degrees, and altitude must be increased (or decreased, for inverted Loops) by an amount equal to at least the turn radius times one and a half, up to twice the turn radius.

◇ AIRDROPPING

A variety of cargo can be dropped with parachutes from any height between 250 to 10,000 meters (altitude levels 2 to 40) from aircraft with speeds no greater than 20. After landing, vehicles are operational in a number of rounds equal to twice their Size (but equal to just the Size for vehicles with Walker movement). For each two levels of altitude dropped, the landing site is displaced one hex per level of Wind Force (see *Winds*, page 90), in the windward direction.

Cargo can also be dropped using a procedure known as Very Low Altitude Extraction, in which the delivery vehicle flies at altitude level 1 and simply drops the cargo from its rear ramp. The cargo is yanked away by a "drogue" chute, which slows it down and somewhat lessens the impact. The aircraft's flying speed must not exceed 8, and the Size of the dropped cargo cannot be greater than 10.

Infantry units can be equipped with paragliders and trained in the Parachuting Skill (see page 70 of the Rulebook). Maximum drop speed and height are the same as for cargo. A paratrooper unit can choose to land anywhere within an area whose radius is equal to the aircraft's altitude level. A Parachuting Skill test vs. one-half of the altitude level (round up, maximum 9) is required to land in the precise hex; otherwise, the Margin of Failure indicates how far the trooper(s) landed from their intended target, in ground hexes. The time required for the drop is half the sum of the altitude levels dropped and the number of hexes between the drop hex and the landing hex, in 30-second rounds. It takes one round for a landed paratrooper to get ready, and one more to meet with his squad.

No parachuting is done with a Wind Force greater than 2; a Wind Force of 2 will doom the paratrooper to certain death on a fumble. A Wind Force of 1 will halve the distance to the landing point if upwind and double it downwind. On the fore side of the wind, it is reduced by 1/3, while the aft side is unchanged. With a Wind Force of 2, the distance, if upwind, is reduced to zero; it is tripled if downwind. The fore sidewind distance would be reduced by 2/3, while the aft one would be halved.

◇ AIRLIFTING

Some VTOL vehicles have the Airlift Capable Perk, which enables them to pick up personnel and equipment without ever having to land. The vehicle must remain stationary over the hex where the person/items to be picked up are situated; every two rounds, the vehicle can pick up one infantry squad or one single vehicle.

FUEL SKIMMING ◇

Fuel skimming is a maneuver where a scoop-equipped vehicle plunges through a planetary atmosphere and use its speed to force gases into its holding tanks. Fuel skimming is a relatively complex maneuver, with a Piloting roll versus a Threshold of 4. If failed, the vehicle takes on only 1d6 x 10% of the intended load. A fumble damages the scoop.

Game-wise, the retractable scoop is a Tool Arm that cannot punch. Its Size rating is cross-referenced with the Size-to-Mass table (page 132 of the rulebook) to determine how many tons of gases can be scooped up per turn. These are sent to a dedicated cargo bay, taking up a volume equal to one cubic meter per ton of mass. The raw gases can be delivered to a processing facility or processed onboard. It takes one hour to process a number of cubic meters equal to twice the vehicle's Size. Each cubic meter of raw gases yield 0.1 cubic meter of usable fuel.

FIRESTARTING ▼

Incendiary weapons can be used to start fires. To ignite a hex, a total of 100 points of Intensity must be fired into it. No attack roll is necessary. Persistent Incendiaries add their Intensity times two. Once the hex is ignited, it is considered to be a fire of Intensity 10. At the end of every combat round thereafter, its Intensity is increased by one until it reaches 20. Once it reaches 20, every adjoining hex ignites as an Intensity 10 fire. Fire will only spread to the hexes that are downwind.

Vehicles crossing a burning hex must pass a Piloting Skill test versus a Threshold equal to one-half of the hex's Intensity. If the pilot fails the roll, treat the result as an Incendiary attack versus the vehicle with a Margin of Success equal to the Margin of Failure of the Piloting Skill test. Treat fumbles as if the Incendiary attack's Margin of Success is equal to the test Threshold.

Only Woodlands and Jungle hexes can be ignited. Alternately, Rough and Clear terrains can be grasslands or scrub and thus can be ignited. Sand, Swamp and Water hexes cannot ignite for obvious reasons. A scenario might cover them with oil or a similar flammable substance and thus allow them to be ignited.

HULL-DOWN POSITIONS ▼

Hull-down refers to a battlefield position where only the weapons are exposed to enemy fire, the hull itself being protected by a natural or man-made obstacle. This reduces the chances of being hit while not impeding the attacker's own fire. Aircraft cannot use Hull-Down positions, VTOLs (with Stall Speed of zero) excepted. Infantry is assumed to always look for "hull-down" positions, hence their natural -2 modifier. They may not claim any damage reduction from "hull-down" positions.

Because of the large ground scale, it is not always possible to exactly place a unit behind a land feature since these are not readily apparent on the map. Instead, a somewhat abstract system is used: by spending MPs, a vehicle can entrench itself behind hard cover almost anywhere. It is assumed that there are suitable terrain features in the hex. The MP cost (see *Hull-Down Table*, below) represents the fact that the unit must move out of its way, find suitable cover, slow down and park itself into the hull-down position. Some terrain types offer less defensive positions than others, and this is reflected in the MP cost. "Covers" shows what is hidden behind the obstacle when the vehicle is in position with weapons at the ready (the numbers listed in the table refer to the System Damage table). The vehicle can also hide completely, covering all locations but unable to fire anything but indirect fire weaponry.

The attack is made normally; if a hidden system is rolled on the System Damage Table, the obstacle absorbs part of the damage first. "Protection" gives the amount of damage points subtracted from the attack. If the damage is reduced to zero, there is no further effect on the target vehicle. To prevent unnecessary bookkeeping, the protection afforded by the cover remains constant and does not ablate under fire. Aimed attacks are not possible against hull-down vehicles.

HULL-DOWN TABLE □

Terrain Type	MP Cost	Covers	Protection
Clear	n/a	n/a	none
Rough, Woodland	+2	2 to 4	15
Sand, Moon Dust	+3	3 to 4	10
Jungle	+1	2 to 6	20
Swamp	+1	2 to 6	10
Water, Liquid Gases*	+3	2 to 6	5
Snow, Frozen Gases	+2	2 to 4	5
Ice	+3	2 to 4	10
Urban	+2	2 to 6	15
Dense Urban	+1	2 to 6	20
Elevation change**	+1	2 to 6	15

* These only produces hull-down effects if the vehicle is capable of immersing itself completely (it must have the Submarine movement type).

**It is assumed that the vehicle is located at the edge of the elevation level.

▼ REMOTE CONTROL

Remote controlled vehicles are referred to as "drones." The remote control equipment is actually a software modification of the Autopilot Perk. Instead of responding to its internal programming, the Autopilot receives its instructions through the communication system and sends back environmental data gathered by its sensor array. A drone must thus be equipped with all three of the above systems. Drones are not affected by "Crew" hits — any such damage is ignored, though Armor points are lost as usual.

Drones are limited by the controller's own action total. A single person cannot control more than one vehicle at a time, though a vehicle can have multiple controllers. Because of data-encoding procedures and control lags, remotely piloted vehicles suffer a -1 modifier on all of their rolls. If the vehicle is controlled through a satellite uplink, the extra lag increases the penalty to -2. The vehicle must be within communication range. ECM affects the control link normally, and must be tested every turn.

Drones may be wire-guided instead, trailing a very fine wire for control (maximum range is equal to half the base Communication range). This removes the penalties and makes the drone immune to ECM. A Piloting roll must be made every turn against the highest MP cost for the hexes traveled to avoid snagging the cable. Flying drones must test also and use the overflow ground's MP cost. Space drones are not affected. Failure means the cable is stuck and the drone must halt for the next round to free it. A fumble means the cable is severed.

If contact is lost, the software automatically switches to the Autopilot. An Autopilot program consists of a single line of text and should be written down when the drone is released.

▣ SAMPLE AUTOPILOT PROGRAMS

•	Return to Base as Fast as Possible
•	Follow Closest Hostile Unit
•	Go to Nav Point Alpha and Await Further Orders

▼ SPACECRAFT MANEUVERS

Spacecraft can perform a variety of special maneuvers and operations due to the nature of their movement system and the milieu in which they operate. The following rules apply to all vehicles equipped with Space movement.

◇ AEROBREAKING

Aerobreaking consists of dipping into a planetary atmosphere to shed velocity, the spacecraft's kinetic energy being converted to heat. This means that less fuel is needed to brake, either decreasing transit time or increasing cargo payload.

The vehicle must have a re-entry system in order to aerobreak. The pilot must make a Piloting roll against a Threshold of 2 to keep the craft correctly oriented or suffer one Fire attack as per normal reentry rules. Modifiers due to damage apply in full. For each successful Piloting roll, the craft loses ten percent of its speed. If there is no re-entry system present, one can still aerobreak in the tenuous upper atmosphere for a one percent reduction of speed and only half damage.

◇ COASTING

Many of the ships don't have enough fuel or reaction mass to keep on accelerating throughout a long trip, since some must be kept as combat reserve. Fortunately, a spacecraft will keep moving even if no acceleration is applied. The following formula shows the travel time of a spacecraft based on the amount of Burn Points the captain or pilot is willing to use during the trip. For the sake of simplicity, the actual acceleration time is ignored since it will account for only a short part of the total trip time.

▣ COASTING

•	Travel Time = Distance / (BPs x 15 x Efficiency)
•	Efficiency = Actual Thrust / Drive Section Thrust
•	Time is in seconds (divide by 3600 for the result in hours). Distance is in meters, BPs is the total Burn Points spent.

◇ GRAVITY WHIP

The term "gravity whip" is used to describe the maneuver by which a planet's momentum is used to accelerate (or decelerate) a spacecraft. Many space probes used this effect to save fuel and travel time, notably the Voyager space probes. A gravity whip can only be used in an orbital system — the spacecraft gains or loses speed when viewed from the entire system, not the body around which it whips. If the spacecraft is slower than the celestial body, it will accelerate; if faster, it will decelerate.

▷ GRAVITY WHIP CONTINUED

A Space Navigation Skill test is made against a Threshold equal to the target's velocity in km/s, divided by ten (round up any fraction). If failed, the spacecraft gains or loses only half the speed it would normally have. If fumbled, the spacecraft misses its orbital rendez-vous completely. Find the speed of the vehicle and the orbital speed of the celestial body used (making sure the units of measure are the same). The spacecraft gains twice the difference between its own (pre-whip maneuver) speed and the celestial body's orbital speed. For example, a spacecraft moving at 5 km/s whips near Jupiter (13 km/s); it gains $2 \times (13-5) = 16$ km/s, for a final speed of 21 km/s. A revised travel time based on the new speed can then be recalculated if precision is required.

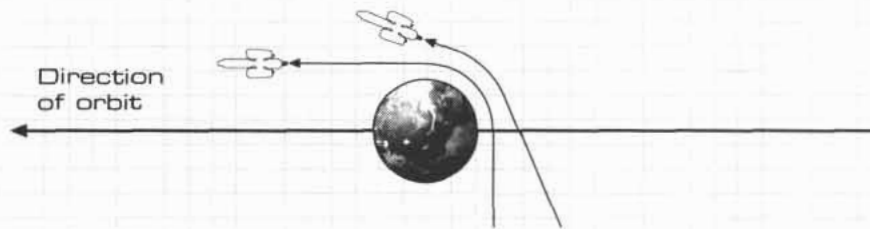
If the spacecraft intersects the orbit at an angle, only its parallel speed vector will be affected. In the interest of playability, the actual equations for calculating the new speed and direction of a spacecraft following a gravity whip are ignored. Those preferring exactitude can find them in any basic astrophysic manual. A game approximation of the new speed can be made by multiplying the spacecraft's final speed by an angle multiplier. Assume that the greater the angle between the spacecraft's original trajectory and the celestial body's, the more the spacecraft's trajectory will curve. For example, if a ship crosses the orbit of a world at a ninety degree angle, its post-whip trajectory will lie almost parallel to the world's orbital path.

ANGLE MULTIPLIER ☐

Planet Position	Angle*	Multiplier
Far	15	x 1.05
Average	30	x 1.1
Close	45	x 1.3

*Angle between spacecraft's trajectory and body's orbital trajectory.

GRAVITY WHIP DIAGRAM ●



HYPERTHRUSTING ◇

Hyperthrusting is a risky maneuver in which the safety parameters of an engine are widely exceeded in order to provide increased thrust. Classic rocket engines can rarely do this, but plasma combustion chambers can greatly increase the available thrust. Such a maneuver is very dangerous since the thrusters may be damaged by overheating, or even explode. It is highly suggested that this rule be allowed only in Cinematic campaigns.

When hyperthrusting is selected, the engine immediately supplies twice its maximum Overthrust, at a cost of 3 BPs for each MP spent. A Piloting Skill test versus a threshold of 5 is required. If failed, the thruster permanently loses a number of MPs equal to the Margin of Failure because of heat damage. Should the total reach -5, the thruster explodes, causing one die times the Overthrust rating (in MP) worth of damage points to the vehicle.

USING THRUSTERS AS WEAPONS ◇

By definition, a good engine makes a good weapon: superheated plasma is extremely dangerous up close, though it loses power rapidly with distance. The Damage Multiplier of thrusters is equal to the MPs spent, times half the Size of the vehicle. The Accuracy of the thruster is equal to the Maneuver of the vehicle. Burn Points are spent as normal. The plasma diffuses rapidly, losing half its Damage Multiplier per hex of range, including the first one.

WALKERS FALLING DOWN ▼

Whenever a vehicle using the Walker movement type takes large amount of damage, it may be knocked down. If the total damage received in one attack is equal to or higher than twice the vehicle's Size, the pilot must pass a Piloting skill test against a threshold equal to one plus the Margin of Success of the attack that hit it. If the walker fails the test, it falls down, taking Light damage. If the walker fumbles the test, it falls down, taking Heavy damage. Walkers must spend one MP to stand up before they can spend MPs on movement.



► ADVANCED TERRAIN

There are many more types of terrain than the few types described in the rulebook. In addition, special conditions such as wind and rain can affect combat and travel. The various terrain types and weather conditions are described in tactical terms, but they can also be used in roleplaying situations. Just remember to adjust the time and distance units appropriately.

▼ MAN-MADE STRUCTURES

Man-made structures include habitations, buildings, bridges, roads and other large immobile constructs. The Players should agree on what human constructions are on the mapboard, if any. Man-made structures take damage in a manner similar to infantry, i.e. they accumulate damage points instead of Light/Heavy Damage effects. Each structure has a *Damage Point Capacity*; if it takes more damage points than this, the structure is reduced to rubble. Burst fire weapons affect constructions in the same manner as infantry (see page 92).

◇ BRIDGES

Bridges span narrow bodies of water, such as rivers and straits, or chasms, such as canyons and gullies. Movement across bridges has the same MP cost as Clear terrain. Each Bridge hex is rated on three Attributes: *Damage Point Capacity*, *elevation level*, and *Size capacity*.

The *Size capacity* of a bridge hex is the maximum *Size* of vehicle that it can safely support. If a vehicle of larger *Size* attempts to cross, one die is rolled. If the die roll is equal to or less than the difference between the vehicle's *Size* and the bridge's *Size capacity*, the bridge loses one tenth of its original *Damage Point Capacity* per point of *Size* difference. The die roll is repeated until the bridge does not take damage (at which point you stop rolling) or until it collapses. If a vehicle is six or more *Size* points greater than the bridge's capacity, the bridge will immediately collapse.

If a bridge hex collapses, any sections of the bridge in adjoining hexes have a 50% chance of collapsing. One die is rolled: if the result is 3 or less, the adjoining bridge hex collapses. All vehicles upon a collapsing bridge take falling damage based upon the number of elevation levels they fall.

◇ ROADS

Roads are designed to make travel easier for ground vehicles by providing them with an ideal travel surface. Roads have 100 *Damage Point Capacity* per ground hex. Any Ground vehicle traveling on a road for its entire movement gains an additional number of MPs equal to half its current speed (Combat or Top), rounded down to the nearest whole number. Additionally, if a vehicle (of any type) follows the path of a road, it pays the MP cost of Clear terrain instead of whatever terrain the road crosses.

Roads can be built over bridges. These roads use the bridge's *Damage Point Capacity* but still confer movement bonus to vehicles. Urban terrains (see below) are assumed to have small streets, but they do not normally receive the road movement bonus due to the large number of minor obstructions in urban settings (speed bumps, parked vehicles, pedestrians, etc.). Any major streets or highways are represented by roads through Urban terrain.

◇ RAILROADS

A railroad is the same as a road, gamewise. An hex can be designed as either a Road, a Rail, or both. Railroads and roads work exactly the same way, except that only vehicles with the Railroad movement type can derive a movement bonus from a Rail. Vehicles using Railroad movement must follow the rail at all times, unless they switch to another movement mode (if available). They can change direction only when the rail changes direction, and they can switch rail lines only at a junction. Both rail lines must be of the same type (both iron, or both maglev, but not iron to maglev, for example).

◇ URBAN TERRAIN

A Ground hex can easily hold several buildings since it is 50 meters across. Any hex containing under seven buildings is considered to be Urban terrain. Any hex containing seven or more buildings is considered to be Dense Urban terrain. Both types of Urban terrain favor Ground vehicles, offering poor traction for Walkers and restricted maneuver space for Hovers.

▣ TERRAIN COSTS

Terrain Type	Walker	Ground	Hover	Obscurement
Urban*	2	1	2	1
Dense Urban*	3	2	3	2

*Damage Point Capacity: 80 per building (assuming generic buildings) for Urban, 100 per building for Dense Urban.

CLIFFS ▼

Any hex with an elevation change of two or more levels is considered to be a cliff. Vehicles may not normally ascend or descend cliffs. The one exception are Walkers with arms. If a Walker has arms that can lift its own Size, it can climb up or down a cliff face. The Walker's pilot must pass a Piloting Skill test vs. a Threshold of 5. The Walker ascends or descends the cliff face at a rate of 1 elevation level per combat round. If the Walker fails or fumbles the Piloting test, it falls the remaining elevation levels. Climbing consumes a vehicle's entire MP allotment and is considered to be equal to expending the vehicle's entire Combat Speed MP. Climbing Walkers are in poor defensive positions and suffer -2 to all defense rolls.

If a vehicle falls an elevation level or more, it takes a number of damage points equal to the roll of two dice times the vehicle's Size times the number of elevation levels fallen. Fumbles are an automatic kill result.

SPACE ENVIRONMENT ▼

The environment of space presents a number of unique characteristics that makes it very different from everything humans have had to face before. New rules have to be learned, and new dangers have to be faced.

PLANETARY RINGS ◇

Many planets in the solar system are surrounded by rings, collections of small debris and rock that are trapped by the gravity well and end up in orbit. The best example of these are Saturn's magnificent ring system, though Jupiter, Uranus and Neptune also boast sizable, if more transparent, rings.

Because they are composed of millions of small particles, rings pose a travel hazard for fast moving space ships. There are, however, reasons to go through them. They make excellent hiding places, are a good deterrent to pursuit, and can yield ice and other valuable volatiles to a stranded vessel.

Unless the ship is moving at a very high velocity, collisions will generally cause only minor abrasion damage, generally not worth checking for. The *Planetary Ring* table below assigns a Density to four main ring systems. The various ring densities within each system are ignored for playability (any good astronomy book will give more specific detail on those). The current spacecraft's speed (in hexes/turn) is multiplied by the Density to yield the number of damage point applied to the spacecraft. The Density also show the amount of water, material or volatiles that can be collected within the ring, per turn (in kilogram).

PLANETARY RINGS □

Location	Density	Obscurement	Composition
Jupiter	10 ⁰	0	Rock, some ice
Saturne	10 ¹	2	Ice, Frozen Gases
Uranus	10 ⁶	0	Ice, Frozen Gases, Hydrocarbons
Neptune	10 ⁷	0	Ice, Frozen Gases, Hydrocarbons

RADIATION BELTS ◇

Half the planets of the solar system have strong magnetic fields, caused by liquid movement within their core. These fields trap incoming charged particles before they can hit the surface, creating multiple radiation belts around the planet (the stronger the field, the more numerous belts there are). These belts are a significant radiation hazard, though most space-ships have screens strong enough to face them without any problem. For playability purposes, the belts have been abstracted for each planet: each number represents a belt. When a ship crosses a belt, it receives a certain amount of rads and damage points per turn, as indicated. Campaigns using the Cinematic RDL need not worry about radiation belts, unless it is for dramatic purposes.

RADIATION BELTS □

Location	Rads	Damage	Effects
Earth	1d6 x 10/1d6 x 5	15/10	Haywire
Jupiter (1-4)	1d6 x 1700	25	Haywire
Jupiter (5-10)	1d6 x 700	15	Haywire
Saturn	1d6 x 500	15	Haywire
Uranus	1d6 x 50	15	Haywire
Neptune	1d6 x 30	15	Haywire



◇ SHADOWS

Unlike most planetary environments, where objects and atmosphere both reflect light so that it shines on several sides at once, in space light comes from a single source, the Sun. Even though there are some reflective surfaces, most of the time light comes from only one direction, creating deep shadows. These shadows, in addition to being very cold (since there is no heat transfer), make most visual sensors useless.

Shadow combat functions as daytime combat except that the night detection score of a vehicle is used instead of its daytime detection score.

◇ EXTREME TEMPERATURES

Extreme cold (-150°C or lower) or extreme heat (+150°C or higher) is very detrimental to the functioning of vehicles. Any vehicle that lacks the appropriate Hostile Environment Protection Perk automatically suffers Light damage whenever pushed to Top speed. In addition, such vehicles must roll one die at the beginning of each combat round. On a roll of one, the vehicle breaks down for a number of rounds equal to the roll of one die.

In space, high temperatures are found only when exposed to the Sun, while shadows are extremely cold. Vehicles can rotate to spread the heat on their hull and thus avoid the temperature problems mentioned above.

◇ VACUUM

Only vehicles that are specially equipped for vacuum (i.e. have the Perk Hostile Environment Protection: Space) can function in a vacuum. If the vehicle lacks life support, the crew must be equipped with vacuum suits. In that case, treat all vac-suited crew injuries as if they were one damage effect higher. For example, if a Light Damage result produces a crew effect (Stunned), it is replaced with the Heavy Damage result (10% Casualties). Likewise, if the vehicle takes Heavy Damage and suffers a crew hit, the damage is increased to the same as Overkill: the people aboard are dead or incapacitated by the decompression, leaving the vehicle crewless.

▼ WEATHER AND HOSTILE CONDITIONS

Players who want to add a little extra realism to their game may want to use some or all of the optional rules below. They give the simplified game effects of common weather phenomena, such as wind, storms and rain. Weather effects are found only on Earth, Mars, Venus and Titan, though the rules for wind and clouds can also be used for the upper atmospheric layers of Jovian-type planets.

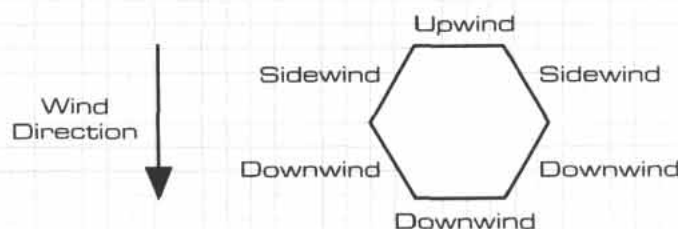
◇ WIND

Strong wind will affect the flight of any given aerial object, and make flying harder for small, lightweight aircraft. Wind is described with two values: Force and Direction. Direction is represented by a simple vector, and is assumed to be consistent throughout the game map. The Force of the wind is calculated in 30 kph increments — identical in essence to aircraft MPs.

Wind Force One (5 on the Beaufort scale) is equivalent to a good draft; flight with ultra-light craft (size 3 or less) and lighter-than-air craft will be difficult, but not impossible (add 2 to the difficulty of any maneuver). Wind Force Two (7 on the Beaufort scale) indicates a strong wind, which will make flight with ultra-light and lighter-than-air craft nearly impossible (add 4 to the difficulty of any maneuver). VTOL aircraft pilots reduce their Piloting Skill by one level. A typical storm has Wind Force Three (10 on the Beaufort scale): the Piloting Skill for fixed-wing aircraft is reduced by one level; for VTOL craft the penalty is two levels. Higher WF levels indicate hurricane-level winds: for each point above 3, the Skill level decreases by one, and Piloting rolls are required for any maneuver other than moving straight ahead.

In addition to making flight more difficult, wind also affect an aircraft's movement. At the end of the movement phase of any aircraft, it is moved downwind an additional number of hexes equal to the Wind Force. The same applies for any normal or carpet-bomb trajectory, counting the appropriate number of hexes for every turn the bomb spends falling down.

□ WIND DIAGRAM



CLOUDS ◇

While clouds have little effect on movement, they do provide an important source of visual Obscurement. Depending on the level of detail desired, the entire map may be covered by a thick layer of clouds, or there may be only specific "cloud" areas with upper and lower limits in elevation levels. Any vehicle that goes in the clouds is considered obscured. For added realism (and bookkeeping), the wind rules can be used to move the clouds a corresponding number of hexes in the direction of the wind at the end of each turn.

Different types of clouds have different Obscurement values, from 1 (light clouds) to 3 (heavy storm clouds). This is for passive (visual) detection only; the Obscurement value decreases by 2 for active scanning.

RAIN ◇

Rain has an effect similar to clouds, and mainly causes visual Obscurement. Earth and Titan are the only place in the solar system where rain occurs, though various gases occasionally condense and "rain out" between cloud levels in the atmosphere of the gas giants.

Light rain does not affect visual detection within 4 air hexes; beyond that, it has an overall Obscurement value of 1. Medium rain has an Obscurement value of 1, while heavy rain has an Obscurement value of 2. For Active scanning, the value decreases by 1. If the rain is an electrical thunderstorm, the listed value is used. Heavy rain can also affect flight: a -1 penalty (-2 for lighter-than-air craft) is applied to all Piloting skill rolls.

BLIZZARDS AND SANDSTORMS ◇

Sandstorms are turbulent dustclouds that obscure both visibility and sensors. If a sandstorm is occurring during combat, one point is added to the Obscurement of every hex of terrain. This translates to a -1 modifier per hex of intervening terrain to all attacks.

Sandstorms can be very dangerous to flying aircraft. Like windstorm, sandstorm are given a Wind Factor, which affects movement by a certain number of hexes each turn. This "wind," however, is very fickle and constantly changes direction. Roll 1 die to determine the wind's direction each turn, for each aircraft.

Sandstorms are more devastating than windstorms of equivalent strength: a sandstorm is treated as being one (1) Wind Factor higher for determining Piloting penalties and effect on small crafts. Sandstorms have an Obscurement value of 3. Fortunately, sandstorms usually have relatively low ceilings: around 1,500 meters for small storms (altitude level 6), up to 2,500 meters (altitude level 10) for big ones.

Blizzards apply the same penalties as sandstorms. In addition, vehicles that lack the Hostile Environment Protection: Extreme Cold Perk must spend one additional MP per hex of ground terrain moved.

NIGHT ◇

Nighttime combat functions as daytime combat except that the Night Detection score of a vehicle is used instead of its daytime Detection score (see page 150 of the **Jovian Chronicles** rulebook). Infantry without nightvision equipment and vehicles without sensors will move only at half speed and have a -1 modifier applied to weapon fire.

Some units are equipped with powerful searchlights that illuminate the area around the vehicle so that it is treated as daylight. Searchlights can be turned on or off at the beginning of each round. Using searchlights obviously make the vehicle easier to spot, however. Any sensor inquiry or weapon fire directed at the vehicle is also treated as if it were in daylight, regardless of the arc of the searchlight. Enemy fire can target the searchlight(s) by performing an aimed shot. If successful, the searchlight is automatically taken out.

Some weapons and warheads release an intense burst of light which illuminate the area around them: in game terms, they are identified by the Illumination characteristic. Illumination ammunition is usually reserved for dedicated flare launchers, but can be manufactured for any gun or missile. Some lasers also have a broad beam, illumination mode to locate and blind unprotected enemy troops. If the weapon also has the Area Effect or Wide Angle characteristic, the entire illuminated area (not just the target) is counted as being in daylight.

Units are more easily detected by sound at night (obviously, only on planets with a atmosphere sufficiently thick to propagate sound, such as Earth, Venus or Titan). Vehicles can be heard up to two kilometers away, infantry only 300 meters. Naval units will be detected up to one kilometer away, unless they keep their speed below two MPs. Stealth vehicles are detected at a distance equal to the above, divided by their Rating. For example, a stealth tank with a Rating of 4 will be heard at a distance of $(2000 \text{ m} \div 4) 500$ meters away.

► INFANTRY

Sometimes, armed men are the only combat unit small enough and flexible enough to accomplish the mission. This is true even in space, despite the problems caused by the vacuum environment. Thus, soldiers still form a large percentage of the fighting forces in the 23rd century. The following rules can also be used to abstract human beings when a large number of them are involved, either for crowd scenes or boarding actions.

There are five levels of infantry quality, which are equivalent to the Skill levels. This also determines the Stamina of the troopers. Stamina is a measure of how much physical punishment each can endure. Each infantry squad has a damage track to keep note of its status (see *Squad Damage Track*, further on). Unlike vehicle crews, infantry are assigned one generic Skill for attack, defense, and other action tests.

▣ INFANTRY QUALITY TABLE

Quality	Stamina	Skill Level	Frequency
Rookie	3	1	Common
Qualified	3	2	Common
Veteran	4	3	Uncommon
Elite	4	4	Rare
Legendary	5	5	Very Rare

▼ ARMOR

Three primary categories of body armor are available to infantry: Light, Medium and Heavy. The heavier armors cause Encumbrance; each point gives a -1 modifier to all attack rolls. The more advanced, self-propelled exo-suits (also referred to as powered Armor) are treated as vehicles and thus are not covered here. Only one type of Armor may be worn at a time. Infantry Armor values are not comparable to vehicle Armor values (see *Damage*, page 158 of the rulebook).

Light Armor consists of thin bulletproof clothing resembling padded combat fatigues. It provides two points of Armor. Medium Armor is a bulky suit of flexible plates worn over normal fatigues. It provides four points of Armor and causes one point of Encumbrance when worn by Rookie or Qualified troops. Troops of Veteran or better Quality do not suffer Encumbrance from Medium Armor.

Heavy Armor is a full suit of metal, ceramic and polymer plates. It provides six points of Armor and causes two points of Encumbrance when worn by Rookie or Qualified troops or one point of Encumbrance when worn by Veterans. Elite and Legendary troops do not suffer Encumbrance while wearing Heavy Armor.

◇ SPECIAL ARMOR FEATURES

Any type of Armor may include either a reflect or interference mesh covering. Reflect triple the Armor value against laser and double it against masers. Interference mesh triple the Armor value against masers. Neither of these add to Encumbrance, but they reduce the unit's Concealment by one.

Infantry must be equipped with vacuum suits in order to survive in space. Vacuum suits are free if the battle takes place in space. Any trooper who is hit suffers an additional number of damage point equal to the roll of one die due to decompression. If this damage exceeds his remaining damage points, the trooper is eliminated. Any extra damage point(s) do not carry over to the next trooper.

◇ SQUAD DAMAGE TRACK

This is composed of three columns which represent the squad members (grouped by ten whenever possible). The first column lists the members numerically from 1 to 10. The Infantry Hit Location Table (see further) refers to these trooper numbers. Circle one number to indicate the squad leader. If he is killed, the squad's effective Leadership drops to 1 (all other Skill rolls are unchanged). The second column lists the type of weapon carried by each trooper. The third column is the trooper's damage points. Each trooper can take a total number of damage points equal to his Stamina plus his Armor.

▼ MOVEMENT

Infantry on foot have 2 MP. They use the Walker movement costs with one exception: it never costs infantry more than 2 MP to travel one hex. No more than two elevation changes are possible per hex travelled (the squads are assumed to be equipped with climbing gear). Infantry units do not have Top speeds.

Some rapid deployment teams are equipped with Man Maneuver Units (MMUs) or tiny unarmed all-terrain vehicles (dirt bikes and the like). MMUs have 6 MPs and use the same movement costs as Hover vehicles; in space, they have 6 MPs and 60 BPs. Squads with light ATVs have 8 MPs and use the same movement costs as Ground vehicles.

SENSORS AND COMMUNICATIONS ▼

Most infantry squads are not equipped with special sensors and have a basic Detection value of 4 during the day and 2 at night or in shadow, with a range of 1 km. Armored infantry can be equipped with basic passive sensor equipment, giving them a Detection value of 4 at all time and a range of 2 km. Infantrymen have small personal communicators to coordinate their actions with the rest of their teammates. If required, they count as -2/2 km vehicle communication systems.

WEAPONRY ▼

Infantry units can carry two types of weapons, basic weapons and heavy weapons. Only a few troopers (habitually two) in a squad carry heavy weapons to deal with tougher opponents. Infantry squads are assumed to carry enough ammunition to last them through a battle. While this is not always true in real life, it dramatically reduces the paperwork for Players with infantry units.

INFANTRY WEAPON TABLE □

Basic Weapons	Accuracy	Damage	Range	ROF
Pistol (Heavy, Gyroc, etc.)	0	x2	0/0/1/2	0
Autopistol	0	x1	0/0/1/2	1
Laser or Maser Pistol	+1	x1	0/0/1/2	0
Taser	0	x2 *	0/0/0/1	0
Sonic Stunner	+1	x1 *	0/0/0/1	0
Rifle	0	2	1/2/4/8	0
Assault Rifle	0	2	1/2/4/8	1
Heavy Rifle	0	3	1/2/4/8	0
Sniper Rifle	+1	4	2/4/8/16	0
Autoshotgun	0	x3	0/0/1/2	1
Submachinegun	0	x2	0/1/2/4	2
Gyroc Rifle	+1	x2/x3	1/2/4/8	0
Gauss Rifle	0	x4	2/4/8/16	1
Gauss Shotgun	0	x2	1/2/4/8	2
Laser Rifle	+1	x4	2/4/8/16	0
Maser Rifle	+1	x2	2/4/8/16	0
Heavy Weapons**	Accuracy	Damage	Range	ROF
Light Machinegun	0	x3	2/4/8/16	2
Chaingun	0	x3	1/2/4/8	4
Anti-Armor Rifle	+1	x7	3/6/12/24	0
Grenade Rifle	0	x8	1/2/4/8	0
Missile Launcher	0	x14	1/2/4/8	0
Light Mortar	-1	x12	3***/6/12/24	0
Sniper Laser Rifle	+1	x4	4/8/16/32	0

*No effect versus Armored infantry and vehicles; **Encumbrance -1; ***Cannot fire at range 2 or less.

INFANTRY ACTIONS ▼

Infantry units have one action. This action is normally used offensively, allowing one attack per weapon type carried. In general, one attack is made by the troopers carrying basic weapons, the second by the troopers carrying heavy weapons. Each attack is a Skill test using the unit's general Skill (with any applicable modifiers). Infantry may attack anything in a 360 degrees radius around them, and do not have defense arcs (consider all attacks as coming from the front).

The massed attacks of infantry squads also provide them with an effective ROF. If two or more troopers are using a certain weapon type, attack with this weapon have a ROF value, as listed in the table below. Infantry ROF use the same rules as normal vehicle ROF (see page 156 of the Rulebook). They may attempt anti-missile fire.

INFANTRY ROF BONUS □

Min. Number of Troopers w/Weapon	ROF bonus	Min. Number of Troopers w/Weapon	ROF bonus
1	0	4	+2
2	+1	8	+3

◇ BOARDING ACTIONS

In space, infantry can be used as marines to board enemy ships. Though exo-suits are preferable, they often do not fit within the tight confines of space ship access corridors. Boarding actions are rare and difficult to do. Even if marines can be sent over, they must face their defensive counterparts, or even crewmen pressed into action with inadequate weaponry.

In order to dock, the attacking ship must match velocity and heading and end in the same hex as the target. Alternatively, Winch weapons may be used to "harpoon" the target and bring it close enough to disgorge troops. Once on the hull, the marines can attack external subassemblies, enter via airlocks or pierce the surface. If the last option is chosen, a number of Damage Points equal to the Armor rating of the ship section will make a hole big enough to admit a Size 2 unit (double damage for each additional two Size points). Armor Crushing weapons do double damage.

Combat takes place as normal, with each 50 meters of the hull and each sub-assembly counting as a separate Dense Urban hex (see page 89); it is thus possible for the attackers to hold only part of a large vessel. The defending Player can assign as many crewmen as desired to the defense, though they will not contribute to the ship's action total. The defenders have an additional point of Concealment at all times due to their knowledge of the ship's layout and their defensive position, two points if the attackers come in via the airlocks.

▼ ATTACKS VS INFANTRY

Due to their small sensor signature and uncanny ability to take advantage of any available cover, infantry do not suffer movement defense modifiers. In addition, a -2 modifier is applied to any unit other than infantry attempting to target them. Some specialized anti-infantry weapons ignore the -2 modifier (see page 88). If an infantry squad is hit, damage is calculated normally. The one exception to this rule are burst fire weapons, which add their ROF bonus to their Margin of Success instead of the Damage Multiplier.

When the squad takes damage, the attacker rolls one die on the *Hit Location Table* to see which trooper is the first to take damage. If the trooper runs out of damage points, the remaining damage points are applied to the next trooper up or down the list, and so on. If damage remains to be allotted up past trooper #1 or down past trooper #10, loop around to the other end of the damage track. Infantry units are very vulnerable to Area Effect weapons designed with the Anti-Infantry characteristic. When such a weapon hits, the damage of the weapon is inflicted upon each trooper.

A trooper is not considered to be a casualty until he has lost all damage points. The debilitating effects of injuries are ignored for convenience. A trooper with zero points remaining is not necessarily dead, but he is unconscious, wounded or otherwise unable to fight. Casualties reduce the ROF bonuses from mass attacks when the number of squad members with a particular weapon drops below the 2-, 4-, or 8-member levels.

▣ INFANTRY HIT LOCATION TABLE

Die Roll	Start at Trooper #	Direction
1	1	down
2	3	down
3	5	down
4	6	up
5	8	up
6	10	up

▼ INFANTRY THREAT VALUE

Choose the Skill, Armor, equipment and weapons, then calculate the Threat rating according to the formulas below. Infantry has a single generic Skill equal to the rating in the parentheses. The individual Threat Rating of all infantrymen is added up, then modified according to Quality. Infantry squads equipped with either MMUs or ATVs double their final Threat Value.

▣ FORMULA

•	Individual Infantryman Threat = square root of $((\text{Stamina} + \text{Armor})^2 \times \text{Weapon Cost})$
•	Weapon Cost = Dam. Mult. + Base Range + ROF

▣ INFANTRY MULTIPLIER TO THREAT VALUE

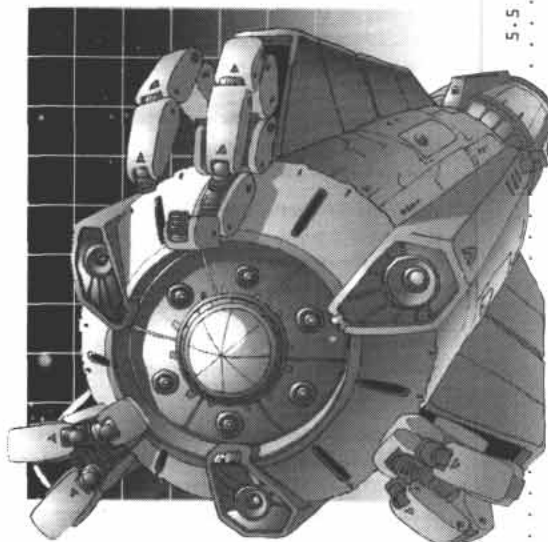
Skill Level	Threat Value Multiplier	Skill Level	Threat Value Multiplier
Rookie (1)	0.25	Elite (4)	4
Qualified (2)	1	Legendary (5)	6.25
Veteran (3)	2.25		

PIRANHA ASSAULT POD ◀

The Piranha is a typical CEGA assault pod designed to carry a squad of marines to an enemy ship. Though normal tactics normally require that the target's engines be disabled first, the Piranha is quite capable of following its quarry and latch on using its grapple launcher. Three docking prongs hold the pod onto the target hull (they will hold on in acceleration of up to 2 gee) while the plasma cutter makes an entry hole for the marines. Piranhas are cheap and short lived, but extremely nasty.

Each Piranha can carry a complete squad of ten marines along with their equipment. Most squads are Veterans. The assault pod is equipped with an autopilot, but most marines prefer to leave the driving to one of their number. Heavily armored space suits are issued to every trooper along with close range weapons such as shotguns.

Decommissioned Piranhas have been known to be used as cheap prospecting boats. Their owner modifies them with added fuel reserves and supplies. They head for the Belt, hoping for the one juicy find that will make them rich. Few achieve their objective, and most remain poor. They come in every few months at Ceres or one of the Belt stations to take on supplies, trying to exchange old stories for a drink in one of the local bars.



5.5

VEHICLE DATA □

Threat Value:		970 (1,200,000 credits, Mass Produced)						
Crew		1 (2 Actions)						
Size		4 (2.1 tons)						
Armor		5/10/15						
► Movement Data								
Movement Mode		Combat Speed		Top Speed			Maneuver	
Space		14 (1.4 g)		28 (2.8 g)			-1	
Deployment Range:		10 hrs						
Reaction Mass:		200 BPs						
► Electronics Data								
Sensors:		-1/2 km						
Communications:		-1/10 km						
Fire Control:		-1						
► Perks & Flaws								
Name		Rating		Game Effect				
Autopilot		-		Act as level 1 pilot				
Backup Systems		1		Comm, FireCon, Life Support, Sensor				
HEP: Radiation		3		Screen				
HEP: Vacuum		-		Specs protection				
Life Support		-		Limited				
Passenger Seating		-		9 troops				
Reinforced Crew Compartment		-		Absorbs first "Crew" hit				
3 x Tool Arm		6		Graspers, cannot punch				
Brittle Armor		-		Loose twice as much Armor per hit				
Sensor Dependent		-		Requires Sensors to function				
Weapon Link		-		All grapples				
► Offensive & Defensive System Data								
Qty	Name	Fire Arc	DM	BR	Acc	ROF	Ammo	Special
1	Grapple	F. Forward	x10	1	-1	0	Inf.	Entangle, Winch
1	Plasma Cutter	F. Forward	x20	M	0	0	LU2	Armor Crushing, HEAT

end of section 5.5 piranha assault pod

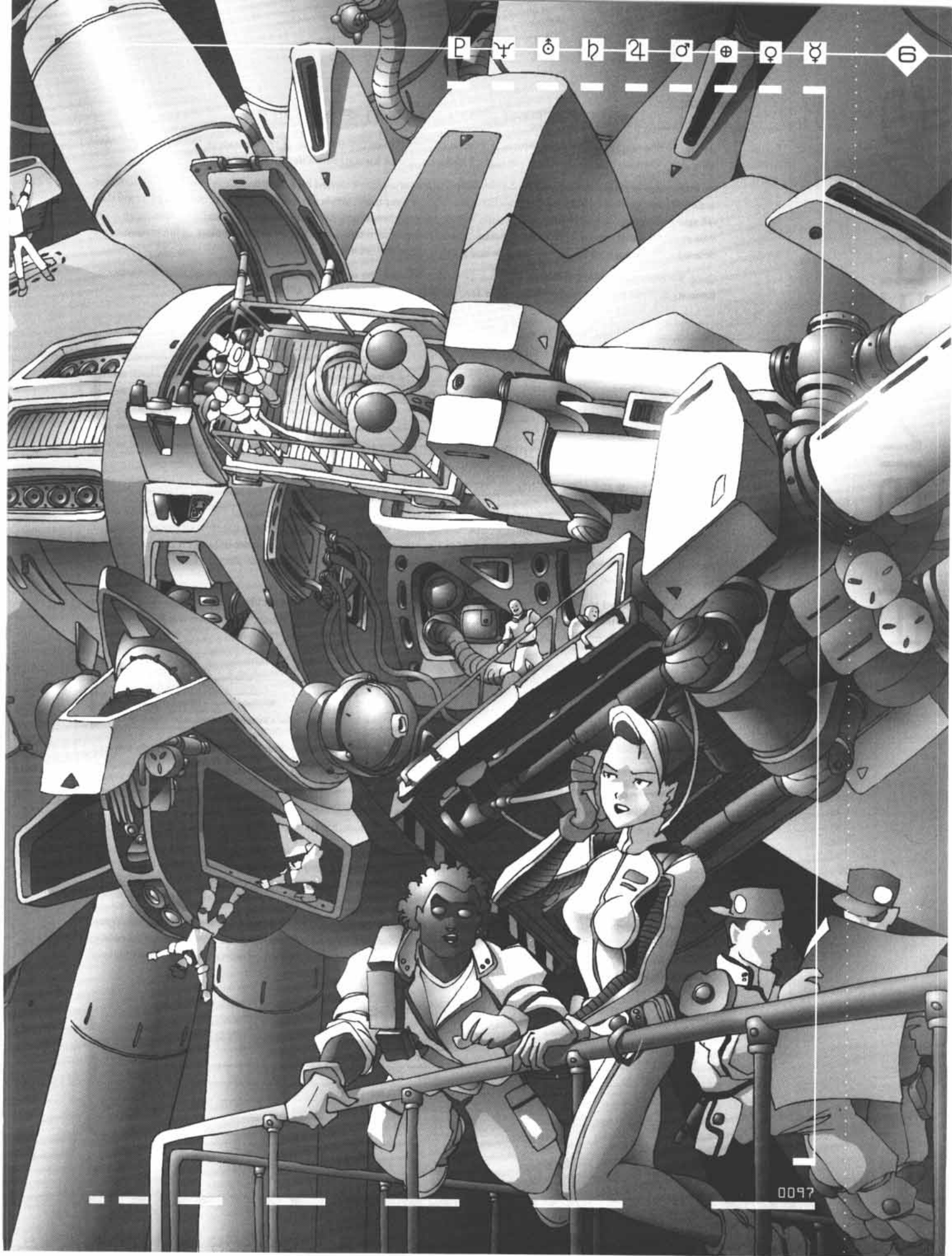
► MECHANICAL DESIGN

This chapter covers the generation process used to define the statistics of the vehicles and other high-tech items used in the game. One does not have to go through the construction system to play; pregenerated vehicles are provided in the various *Jovian Chronicles* sourcebooks. But to many, designing new vehicles and testing them is definitely an enjoyable part of the game.

When the Silhouette Vehicle Construction system was designed, two primary goals were set: first, keep things simple; second, allow players the maximum design flexibility possible. These two principles led to the creation of a reverse engineering-based design system. Instead of having designers pick a standardized chassis and then assign points to cram as much as possible onto it, the system let them pick their final result first and worry about cost later.

As a result, the Silhouette vehicle generation system is quite liberal compared to the ones found in many other games. It is meant to provide interesting, "real" vehicle designs instead of just mere sets of game statistics pulled out of charts and complex formulas. There is no artificial formula-based space or weight limits placed on the components: if the vehicle must have a certain piece of equipment, the engineers will find a way to make it fit somewhere.

Since this system was created to handle any vehicle type, it is non-linear in nature and involves a few calculations. These have been broken down in easily manageable formulas for ease of play and reference, so the math should not prove to be a burden (see the *Roots and Exponents* sidebar). It is assumed that the reader is already familiar with the various vehicular Attributes and ratings (see page 131 of the *Jovian Chronicles* rulebook).



► CONCEPTUALIZING THE VEHICLE

This is the first step in designing a vehicle, although it is not part of the construction process per se. The overall concept behind the vehicle must be decided upon (see the sidebar below for suggested design questions).

No limits have been placed on the number of weapons and equipment carried by a vehicle. This is intentional. It is meant to simplify the game and make the construction system more adaptable. While it is *theoretically* possible to build a tank that will sport battleship armor and weapons while still performing like a race car, that one tank will probably cost more — in resources, time and money — than an entire brigade of more regular tanks. Guidelines and technological limits have been defined to fit the style of the game, but one could still build monsters if left unchecked.

Once the basic parameters of the vehicle have been determined, the design process may begin. In addition to the book, some scratch paper, a pen and a calculator (if Threat Value and cost are desired) will also be needed.

▣ DESIGN WORK LIST

1)	What kind of vehicle is it? (e.g. tank, exo-armor, microsub, etc.)
2)	What is the vehicle's main task? (e.g. strike, siege, search and rescue, etc.)
3)	How advanced is the vehicle? (e.g. old & reliable, everyday, state-of-the-art, etc.)
4)	What are its general performances? (e.g. slow, fast, long ranged, etc.)
5)	What is the vehicle's main armament, if any? (e.g. autocannons, lasers, rockets, etc.)
6)	Does this vehicle have any important special features? (e.g. powerful sensors, a sick bay, passenger cabins, etc.)

▼ SELECT TARGET SIZE

The first design step is to choose a reasonable Size for the vehicle, either by using one of the formulas below or by consulting the table on page 132 of the rulebook. Size is related to both weight and volume; it determines the actual weight of the vehicle, the amount of damage it will cause in the event of a collision, and the number of hexes it occupies on the tactical map. Some vehicles occupy more space than their Size would indicate — lighter-than-air craft, for example. This will be detailed further on.

Vehicles are assumed to occupy a basic volume (in cubic meters) equal to $(\text{Size}/2 + 1)$ cubed, rounded up. This includes access and maintenance space around it. Knowing the volume is not required for the design process but is useful when doing "reality checking."

▣ DETERMINING SIZE

•	Maximum Mass = $((\text{Size} + 0.5) \times 3)$ cubed
•	Size = $((\text{cube root of Maximum Mass})/3) \cdot 0.5$

The maximum mass for all Size categories is in kilograms (divide by 1000 to get metric tons). The mass is rounded up for all Sizes for simplicity.

▼ SELECT ARMOR RATING

This rating defines how resistant to damage the vehicle will be. Even if the vehicle is not armor-plated, it must still have an Armor rating to represent the protective value of the vehicle's structure. No vehicle can have an Armor rating below 1.

Just like Damage Multipliers, Armor Value progression is not linear: Armor 10 is not just twice as strong as Armor 5, it is *four* times as strong. The Armor Rating does not only represent the thickness and angle of the armor plating, but also the general resistance of every component in the vehicle. The number of damage points required to produce Light Damage, Heavy Damage, and Overkill results are equal to once, twice, and three times the base Armor rating, respectively.

For the military enthusiasts, the base Armor rating of a vehicle is approximately equal to the square root of the armor plate thickness in millimeters, assuming perfect armor steel. Armor does not have to represent the exact thickness of the plating — some materials are stronger than others. It is possible to selectively boost the Armor rating through the addition of specialized armor plates (see *Perks and Flaws*, page 112).

▣ TYPICAL ARMOR RATINGS

Vehicle	Armor Rating	Vehicle	Armor Rating
Civilian Vehicle	1 to 5	Armored Personnel Carrier	10 to 20
Utility Vehicle	3 to 8	Tank	20 to 30
Exo-Suit	5 to 10	Naval Ship	50 to 150
Exo-Armor	20 to 30	Space Ship	30 to 90
Fighter Jet	8 to 15		

DESIGNER'S HINT: ARMOR ◇

Here's a good rule of thumb for choosing a vehicle's Armor rating: unarmored or slightly armored vehicles have Armor ratings roughly equal to their Size rating to represent their structural strength. Lightly armored vehicles have Armor equal to roughly twice their Size. Moderately armored vehicles have Armor equal to about two and half times their Size. Heavily armored vehicles have Armor equal to roughly three times their Size. Anything with an Armor rating greater than three times its Size is either incredibly slow or completely unrealistic.

Due to the severe weight restrictions required by the mechanics of flight, aircraft rarely have an Armor rating that is more than twice their actual Size. For military craft, the Armor rating is usually just under that limit.

SELECT NUMBER OF CREW ▼

The number of individuals that are required to operate the vehicle is chosen here. Numerous specialized crewmembers improve a vehicle's combat efficiency, but they increase cost and vehicle size. All vehicles need at least one crewmember, but crew can be augmented or even replaced by automated systems (see *Perks and Flaws*, page 112, and *Offensive & Defensive Systems*, page 124).

Theoretically, the designer could maximize a vehicle's performance by allotting it an unusually large crew. A crewmember, however, occupies almost two cubic meters of space (with seat, instruments and egress/ingress space) — sixteen people will not fit comfortably in a sub-compact car! What's more, a good crew is expensive. Training and paying each vehicle crewman costs hundreds of thousands of credits. In fact, the crew is often worth more money than the vehicle, so most designers will put only the minimum amount of crew required for the job.

SELECT MOVEMENT SYSTEMS ▼

Movement types define how a vehicle moves along. Each movement type confers some advantages and some disadvantages, depending on the environment where the vehicle operates. Some are more versatile than others.

A vehicle may have more than one movement type. Common examples of this are fully amphibious vehicles (Ground and Naval), exo-armors with thrusters (Walker and Space), or any combination thereof. Although there is no limit to the number of movement types a vehicle may use, few have more than one or two — the cost simply outstrips the added flexibility. Having more than one movement type does not represent an actual transformation; the movement types are available at all times (see page 145 for transformable machines).

Flight: this movement type is used by all flight-capable vehicles. This includes aircraft of all types, helicopters and vectored thrust vehicles. Each aircraft's peculiar flight characteristics are provided by suitable Perks and Flaws (see *Perks and Flaws*, page 112).

Ground: any wheeled or tracked vehicle. Wheeled vehicles are assumed to be equipped with large wheels and strong suspension for rough terrain and thus are grouped with tracked vehicles in the Ground movement type. Ordinary wheeled vehicles such as city cars have the Poor Off-Road Capacity Flaw to represent the more simple nature of their drive system (see *Flaws*, page 120).

Hover: this movement type is used by all vehicles which travel above but near the ground, such as ground-effect hovercraft and other air-cushion vehicles. Ground-effect systems only work within an atmosphere.

Naval: any conventional water vessels and hydrofoils, or anything that can float. This makes only the vehicle's hull watertight, however: it is still susceptible to flooding and capsizing.

Rail: any vehicle which uses a rail or guide of some kind to move about is part of this category. This includes classic steel railroad, MagLev, monorail, and many others. These vehicles can only move along a rail line, and the rail(s) must be of the same type as the one the movement system was designed for.

Space: a vehicle equipped with reaction thrusters uses this movement system. This movement type does not confer the ability to perform standard atmospheric flight or reentry — these must be purchased separately. It can be used as a "jumpjet" system in a gravity well (see *Jumping*, page 145 of the rulebook).

Submarine: this movement type covers underwater craft of all sorts. Most Submarine vehicles also have the Naval movement type, but it is not required (some submarine vehicles fare very poorly on the surface).

Walker: this represents a multi-legged walking vehicle. The exact number of legs presents is totally up to the designer and has no bearing on either speed and toughness, both of which are determined separately.

SPEED ◇

A Top Speed, measured in kilometers per hour, must be selected for each movement type. Each speed is divided by six (6) to get the Top Speed in Movement Points (MPs), rounding to the nearest whole number. This MP value is divided in half to obtain the Combat Speed of each movement type, rounding up. Vehicles with multiple movement modes are rarely as fast as those with only one.

◇ SPECIAL CASE: FLIGHT

The Flight movement mode includes all manner of flying machines, excluding hover-based movement. The movement mode *does not discriminate* between fixed and rotary wing crafts. There is, however, a fundamental difference between VTOL (vertical take-off and landing) crafts and other types of aircraft: the Stall Speed.

All vehicles with the Flight movement type are given a Stall Speed. This indicates the minimum possible speed at which the aircraft can travel before stalling out, losing lift and falling. A Vertical Take-Off and Landing (VTOL) craft has a Stall Speed of 0, which means it can actually hover in place.

Most non-VTOL aircraft have a secondary movement type (usually Ground) to taxi around the runway, though it does not necessarily have to be motorized. In such case, the second system's speed is 0, and its MPs come from the Flight MPs. Many aircraft with Ground speeds have the Decreased Maneuver Flaw (see page 120) to represent the fact they are somewhat ungainly on the ground. Note that this is actually a free bonus, since the Ground movement is generally 0 (unpowered) and thus free. VTOL crafts rarely have a secondary movement type, since they often do not need to taxi.

Air Combat MPs represent about 30 kilometers per hour each, instead of 6 kph for vehicles in the basic tactical game, to fit in with the large Air Combat 250-meter hexes.

◇ SPECIAL CASE: SPACE

The Space movement mode includes all manner of thrust-based movement. The movement mode does not discriminate between reaction and reactionless drives (though the latter does not exist in the world of the **Jovian Chronicles**). As usual, precise description of how the vehicle functions is left to the designer.

Space Combat MPs represent acceleration rather than speed: about 1 m/s² each (0.1 g), instead of 6 kph for vehicles in the basic tactical game. Fractional MPs are possible for vehicles with very low acceleration (solar sails, ion drives). In such a case, the vehicle must accumulate fractions over several rounds to get one Movement Point.

◇ DESIGNER'S HINT: POWERPLANT

Silhouette does not require the designer to buy a powerplant. It is assumed that the engineers in charge of the project know their job and will select an efficient engine that fits the chassis for the desired movement systems and speeds. If they don't... well, that's what Lemon Rolls are for. It is always nice but not required to know exactly how the vehicle is powered, if only to give the game additional atmosphere.

▼ SELECT MANEUVERABILITY

The Maneuver score represents how maneuverable and agile the vehicle is. Zero is a generic "average" rating for a human-controlled walker; other vehicles are often assigned lower values. Positive values denote nimbleness while negative values indicate a slower reaction time or poor turn radius. The Maneuver score need not be tied to the physical size of the vehicle: a cumbersome farm tractor might be just as (or even less) maneuverable than a large combat corvette whose surface is covered with maneuver verniers.

□ MANEUVER VALUES

Maneuver	Typical Vehicle	Maneuver	Typical Vehicle
+3	Very advanced, top-of-the-line research vehicle	-4	Patrol Boat, Large Truck, Medium Space Ship
+2	Very advanced, top-of-the-line prototype	-5	Large Hovercraft, Large Space Ship
+1	Nimble Exo-Suit, Dirt Bike	-6	Large Naval Vessel or Ponderous Spaceship
0	Nimble Exo-Armor, Exo-Suit, Motor Bike, Dirt Buggy	-8	Ponderous Naval Vessel
-1	Exo-Armor, Car, Nimble Hovercraft	-9	Supertanker
-2	Large Exo-Armor, Large Car, Hovercraft, Fighter	-10	Space Station
-3	Truck, Tug Boat, Small Space Ship		

◇ DESIGNER'S HINT: MANEUVER

The table above lists some typical examples for each Maneuver Rating. If the vehicle you are designing is exceptionally agile, 1 or maybe even 2 may be added to the suggested value for that type of vehicle. If the vehicle is slow to respond, or somewhat ungainly, perhaps 1 or possibly even 2 could be subtracted from the suggested value.

In a sense, the Maneuver rating also partly represents the sophistication of the vehicle's controls. An agile vehicle that is next to impossible to pilot in battle will earn a lower Maneuver Rating than the unstable fighter which can respond to the slightest tug on the control sticks. By using this in conjunction with the correct Perks and Flaws, extra "personality" can be given to the vehicle.

SELECT DEPLOYMENT RANGE ▼

The Deployment Range of the vehicle is selected next. This is the maximum distance (expressed in kilometers) the vehicle can cover without refueling or maintenance, barring any crew needs such as food and rest. This generally has no direct influence in the tactical combat game, but is extremely important in a roleplaying campaign. It can also be used to establish complications in tactical scenarios.

Combat vehicles often have somewhat inefficient engines that guzzle their fuel or electric charge in just a few hours. Most ground vehicles can cover somewhere between 200 and 800 km before needing to be refueled or otherwise serviced. Understandably, aircraft tend to have pretty large Deployment Ranges. Fixed-wing planes have more autonomy than rotary wing aircraft: averages for the former range from 800 to 5,000 km, while for the latter it rarely exceeds 1,000 km. The "generic" cost-efficient value for all designs is 500 km, though small vehicles will probably have a lower range.

Space vehicles obviously cover far greater distances and, thanks to inertia, may not even need to expend fuel to do so. When in space, each hour of operation is treated as one kilometer of Deployment Range. Thus, an exo-armor with a Deployment Range of 500 km could walk 500 kilometers or fly in space for 500 hours (or any combination thereof, with one hour equal to one kilometer) before requiring maintenance.

DESIGNER'S HINT: DEPLOYMENT RANGE ◇

Military vehicles need to have enough fuel to reach their objective, perform their mission, and return. This means that their effective range is normally a bit less than half of their listed Deployment Range because the vehicle must conserve enough fuel to return from its mission and an extra reserve to consume in case of emergencies or combat.

Scout vehicles need to operate for long distances without access to support units. Fire support and siege vehicles generally have poor Deployment Ranges since they have near constant access to fuel and service. Urban and civilian vehicles also tend to have poor Deployment Ranges, for the same reason.

Spacecraft are a special case in the Jovian Chronicles universe. Most if not all of them are powered by extremely efficient and compact fusion engines. Range is thus much more dependent on reaction mass and food storage than on onboard fuel reserve, with the DR serving only as a benchmark for maintenance operations. Players who require more precision can assume that storage space for additional stores of food, spare parts and replacement chemicals takes up (vehicle Size²)/1500 cubic meters per hour of DR, at a weight of 0.2 ton per cubic meter.

SELECT REACTION MASS ▼

This step applies only to vehicles with the Space movement type. Some kind of reaction mass (or fuel, in the case of older chemical engines) must be provided in order to propel the vehicle forward. The Reaction Mass rating shows how many Burn Points (BPs) of reaction mass may be carried internally. The weight of the reaction mass will be added to the final weight of the vehicle after the design is completed; the *Burn Points Per Ton* table is used to determine its weight. It is important to note that the acceleration of the spacecraft, as selected previously, already takes this extra weight into account.

The amount of Burn Points per ton will depend on the type of reaction mass used. Fusion engines are extremely efficient, while primitive fuel rockets will often carry many times their empty weight in fuel.

BURN POINTS PER TON □

Reaction Mass/Fuel Type	Weight Multiplier	Volume per Weight
Very Light Gases	$10^3 \times \text{total BP}$	0.01 ton/m ³
Light Gases	$2 \times 10^3 \times \text{total BP}$	0.1 ton/m ³
Water	$2 \times 10^4 \times \text{total BP}$	1 ton/m ³
High Efficiency Rocket Fuel	$10^2 \times \text{total BP}$	2 ton/m ³
Low Efficiency Rocket Fuel	$5 \times 10^2 \times \text{total BP}$	5 ton/m ³

Multiply the above number by the empty weight of the craft to know the weight of the reaction mass. The Volume per Weight is given for transporting Reaction Mass as cargo.

DESIGNER'S HINT: REACTION MASS ◇

Reaction Mass and Deployment Range are the twin factors that will determine the autonomy of a space vehicle. It is useless to carry more reaction mass than can be used in the vehicle's entire deployment range, though the reverse is possible (the vehicle can always coast partway to its destination).

If the vehicle is intended to have ground-to-orbit capacity, it must carry enough Reaction Mass to allow its thrusters to operate long enough at the required thrust level to get to escape velocity. Refer to *Reaching Orbit*, page 143 of the **Jovian Chronicles** rulebook.

▼ SELECT SENSORS

The quality and the range (in kilometer) of the vehicle's sensor array is chosen at this point. The Sensor rating represents the resolution and processing speed of the vehicle's detection systems and is crucial for battles in obscured environments. A generic military sensor array has a rating of 0. Poor or incomplete sensor systems are rated with negative values (minimum value is -5), while high quality sensors have positive ratings (max. +5). If the vehicle has no sensors, "N/A" is written down in both entries and the No Sensor Flaw is added (see *Perks and Flaws*, page 112).

Battlefield vehicles normally have Sensor ranges of at least 2 km. Sensor ranges are rarely greater than 7 or 8 km — mainly because that is about how far the horizon is on an Earth-sized planet when seen from a combat vehicle. This base range can be extended by supplying more power to the system (see page 151 of the rulebook), but this makes the emitter quite visible to hostile sensors.

Sensors mounted on a flying vehicle benefit from a higher vantage point, allowing them to reach further for the same power. When the aircraft is in the air, the range of its sensor array is multiplied by ten *while in the air*. Thus, if a plane had a 2 km Sensor range on the ground, it would be able to passively detect other objects up to 20 kilometers away in the air.

Spacecraft-mounted sensors have an even better environment to work in, since there is no atmosphere to distort the readings. The range of a spacecraft's sensor array is multiplied by one hundred. Thus, if a spaceship had a base 2 km Sensor range, it would be able to passively detect other objects up to 200 kilometers away *while in space*.

◇ DESIGNER'S HINT: SENSORS

The Sensor range should be equal to or higher than the Extreme range of the most powerful weapon system aboard the vehicle. If not, the crew will not be able to use the weapon to its maximum capability. The basic Sensor range can be boosted (see page 151 of the rulebook), but doing so makes the emitter much more visible to the enemy.

▼ SELECT COMMUNICATIONS

The quality and the range (in kilometers) of the vehicle's communications array is chosen at this point. A generic military communications system has a score of 0. Poor systems are rated with negative values (minimum is -5), while high quality systems have positive ratings (max. +5). If the vehicle has no communication system, "N/A" is written down in both entries. Communication systems normally have a ground range of at least 10 km. This can be extended by supplying more power to the system, but makes the emitter more visible on sensors (see page 151 of the rulebook). Some Perks can affect the rating and range of the Communication system (see *Perks and Flaws*, page 112).

Because there are less obstacles to get in the way of radio waves, communication systems have a better range in the air and in space. Communication range is automatically multiplied by ten at no cost, *while in the air*, for Flight-capable vehicles. Range is automatically multiplied by 100, *while in space*, for space-based communication system.

◇ DESIGNER'S HINT: COMMUNICATIONS

A functional Communication system is more important than it seems. It allows the vehicle to receive coordinates for indirect fire, transmits the correct IFF signal to friendly defense installations such as minefields and automated turrets and can be used to control remote drones. A vehicle without a functional Communication system is cut off from its combat group.

Non-combat vehicles like transports often have poor communications systems, which doesn't mean they are cheap — they are just not designed to cut through the military electronic fog. They rate a -2 or -3 and have a base range of less than 10 km.

▼ SELECT FIRE CONTROL

Fire Control modifies all of the vehicle's weapon attacks and represents the targeting computers and weapon mounts. Most combat vehicles have a standard military system (Fire Control rating of zero), which includes rangefinders, gyro-stabilized mounts and recoil compensators for the weapons. Very high tech vehicles have sophisticated fire control systems, earning them a +1 or maybe even a +2. Simple, cheap or crudely built vehicles often have poor Fire Control systems, rated at -1 or lower. The minimum value is -5: a simple metal sight on a wobbly hinge, with pull-cord trigger.

If the vehicle is a non-combat vehicle with no weapons, a Fire Control rating should still be assigned to represent its potential for mounting weapons. Most non-combat vehicles have fire control ratings of -3 or less — they don't have built-in dedicated targeting computers or gyro-stabilized mounts. Pintle-mounted weapons do not use the Fire Control system (see the *Pintle Mount Perk*, page 118).

◇ DESIGNER'S HINT: FIRE CONTROL

Fire Control systems can send the vehicle's cost through the roof, so moderation should be applied when selecting a rating. If extremely accurate attacks are desired, individual weapons with high Accuracy may be a better choice. Taking a -1 Fire Control instead of zero may sound suicidal, but is a good way to stuff more powerful weapons in the vehicle.

SELECT PERKS AND FLAWS ▼

Many vehicles have special characteristics called Perks and Flaws. Perks are systems or design features that give additional capabilities to the vehicle. Numerous Perks can make a vehicle very complex, increasing the odds that defects will occur during design or assembly. Flaws are design shortcomings or defective systems that impair the vehicle.

A complete explanation of each Perk and Flaw can be found in the *Perks and Flaws* section, page 112. Those that apply to the vehicle should be marked down along with their rating (if applicable) and their point cost.

DESIGNER'S HINTS: PERKS AND FLAWS ◇

Perks and Flaws are the greatest pitfall for new vehicle designers in **Silhouette**. Typically, a beginner's first vehicle design has dozens of Perks and relatively few Flaws. There are two ways to control Perk costs.

The first is to cherry-pick the Perks that are most important to the design and leave out minor improvements that drive costs upwards without significantly improving performance. It is always assumed that basic equipment such as seat belts, headlights and running lights (where applicable) are already included in the vehicle's design.

The second method to control cost is to select appropriate Flaws to compensate for the chosen Perks. For example, the cost of a Satellite Uplink or other complex electronic systems could be reduced by adding the Vulnerable to Haywire Flaw, representing the vehicle's sensitivity to massive electrical attacks.

SELECT OFFENSIVE AND DEFENSIVE SYSTEMS ▼

The weapons and defensive systems mounted on the vehicle are selected at this stage. For more detail about the different weapon systems and options, refer to the *Offensive and Defensive System Design* section (page 124).

Loading down a vehicle with tons of weapons just for the sake of having more is not only pointless, but also wasteful. Most vehicle crews are only capable of firing one or two weapons per combat round without incurring some nasty penalties. Linking two or more weapons provides a solution, but tends to be costly in ammunition.

Choosing a balanced amount of ammo for each weapon is also very important. Vehicles often get disabled in battle; when that happens, all the points spent on extra ammo and guns are wasted. Better to assign a reasonable ammunition load and buy more vehicles than build a single gun-bristling monster that can be disabled by one lucky hit.

DESIGNER'S HINTS: WEAPONS ◇

Vehicles should have a weapon complement that reflects their mission. Fire support models have weapons capable of guided attacks or area saturation. Scouts carry light weapon loads because they are supposed to avoid combat. General purpose combat vehicles carry an assortment of medium-strength weapons to deal with a variety of situations.

A good indicator for the number of weapons that can be carried by a vehicle is the Size rating. While it is not a hard limit, if there are more weapon systems than Size points, the design is probably overarmed. Another suggested control method would be to say that a vehicle can carry one weapon of its own Size, then $(\text{Size} - \text{Min. Size})^2$ for lesser weaponry. For example, a Size 12 vehicle could carry two Min. Size 11 weapons, or thirty-six Min. Size 6 weapons.

GENERATING THE NUMBERS ▼

The Threat Value and cost of a vehicle do not necessarily have to be figured out in order to use it in a given roleplaying campaign. Just plugging in the stats and playing is a perfectly valid option if a Gamemaster is present to balance the forces in presence. The Threat Value is useful only when hard numbers are required — for example, to help balance a one-shot tactical scenario, or to assign a price to a vehicle.

Threat Values enable the players to establish campaigns without the help of a Gamemaster. A single number is not the ultimate, perfect representation of a vehicle's worth, however. This is why a vehicle's Threat Value is further broken down into Offensive, Defensive and Miscellaneous Scores. These three "sub-values" point out the strengths and weaknesses of each vehicle design, making it much easier to balance out scenarios according to the mission at hand.

Calculating the Threat Value of a vehicle is a logical process involving separate, sequential steps. First, the Offensive Score, Defensive Score, and Miscellaneous Score values of the vehicle must be figured out. These three scores are then averaged together to determine the vehicle's total Threat Value. This allows the player to change some equipment or values without having to recalculate the whole vehicle. For the sake of simplicity, the scores and final Threat Value should be rounded off to two significant numbers once all calculations are done. This makes their use less cumbersome.

THREAT VALUE FORMULA □

$$\text{Threat Value} = (\text{Offensive Score} + \text{Defensive Score} + \text{Misc Score}) \div 3$$

◇ ROOTS AND EXPONENTS

Although **Silhouette** is a fairly simple rules system, some math was bound to creep its way in. Fortunately, most calculators have both the root and exponent functions, or at the very least the exponent function. If the calculator used is of the latter type, roots are still possible — just invert the exponent (see examples below).

The following format is used throughout: Squares are exponent 2, and Cubes are exponent 3. Higher levels of exponents are not used.

▣ CALCULATING ROOTS AND EXPONENTS

•	Exponent of number = number ^{exponent}
	examples: square of 2 = $2^2 = 2 \times 2 = 4$ cube of 2 = $2^3 = 2 \times 2 \times 2 = 8$
•	Root of number = number ^(1/root needed)
	examples: square root of 16 = $16^{(1/2)} = 4$ cube root of 8 = $8^{(1/3)} = 2$

◇ THE OFFENSIVE SCORE

Vehicles with high Offensive Scores are especially good at dishing out damage. On open terrain and in face-to-face confrontations, they are very likely to come out on top. The base Offensive Score is the total of the ratings of all the vehicle's weapons and their required ammunition.

If a weapon has either a Fixed Forward (FF) arc or is turret-mounted, its weapon rating is altered. Weapons with FF arcs have a x0.6 multiplier applied to their Weapon Threat Rating while weapons with T arcs have a x1.8 multiplier applied to their Rating (this includes the cost of the turret). The turret may be deemed "slow" (ST): the player must choose a 180 degrees fire arc for it each turn; the cost multiplier is x1.5 instead. Only Weapon Cost, not ammo cost, is multiplied for these special arcs; ammunition is ammunition, regardless of the mounting of the weapon firing it.

A Weapon Link allows multiple weapons to be linked to a single fire control mechanism. One action is required to fire the weapon link. The link's Accuracy and Range are equal to the worst ratings among the link's weapons. Each weapon attacks and is rolled for separately. As soon as one weapon misses, all the other weapons not yet fired automatically miss (but still use ammunition). When a link is fired, all of the weapons in the link fire. However, the individual weapons that make up the link may be fired individually. Weapons may be part of more than one link. Damage is applied only after all weapons in the link have been fired; the Armor rating of the target remains the same throughout the attack.

A Sniper System is an additional targeting device that allows a weapon to have better accuracy at long range. In game terms, a weapon equipped with a Sniper System has a +1 modifier to the attack roll at Long and Extreme ranges. An Air/Ground System is a targeting device designed to help hit aerial targets (when on ground) or vice-versa. It removes the penalty for attacking targets in the air (or ground, for aircraft); see page 149 of the rulebook.

Punching ability for all types of arms is entirely optional and must be paid for by squaring one-half of the punch's Damage Multiplier to calculate the weapon rating of each punching arm. Note that it is possible to have a lower punch Damage Multiplier than the rating of the arm — it just requires more bookkeeping since a separate rating must be recorded. If a higher DM is desired, a melee weapon should be bought.

▣ CALCULATING THE OFFENSIVE SCORE

Weapon Arcs and Special Systems	
•	Weapons with FF arc = Weapon Threat Rating x 0.6
•	Weapons with T arc = Weapon Threat Rating x 1.8
•	Weapons with ST arc = Weapon Threat Rating x 1.5
•	Weapon Link = Total cost of all weapons in link x 1.1
•	Sniper System = Total cost of all weapons in system x 1.1
•	Air/Ground System = Total cost of all weapons in system x 1.1
•	Punch Rating = (Damage Multiplier of arm x 0.5) squared
The Offensive Multiplier is equal to the sum of the following:	
•	Costs for all Weapons
•	Ammunition costs for all weapons
•	Cost of Special System, if present (Link, Sniper, Air/Ground)
•	Punch rating for each arm (if applicable)
•	Offensive Score = Targeting System Multiplier * x Offensive Multiplier

* Do NOT use the Fire Control rating. Instead, look up the rating on the Targeting System Multiplier table and use the multiplier given by the table to calculate the final Offensive Score.

TARGETING MULTIPLIER

Fire Control Score	Multiplier	Fire Control Score	Multiplier
+5	700	-1	0.5
+4	120	-2	0.333
+3	24	-3	0.25
+2	6	-4	0.2
+1	2	-5	0.167
0	1		

THE DEFENSIVE SCORE

Vehicles with high Defensive Scores are especially good at avoiding damage or surviving it. Their strong point is defending objectives and escaping enemy forces. The Armor rating and all movement modes are included in the calculation. The second and subsequent slowest movement speeds are added together. For example, if a vehicle had the Flight (fastest), Ground and Naval movement types, the latter two would be added together for calculation purposes. Ground and Rail vehicles with no other movement modes use a slightly modified Defense Score formula to reflect their simpler drive mechanisms. Their speed should be divided by 40 (for Ground only) or 60 (for Rail only) instead of 25.

The following formula produces the vehicle's Defense Score. Threat Values are calculated the same for flight-capable vehicles as for any other vehicle, with one little exception: a modified formula for the Defense Multiplier must be used. It takes into account the higher speeds of aircraft and also includes the Stall Speed since this can have a significant tactical effect.

CALCULATING THE DEFENSIVE SCORE

The Defense Multiplier is equal to the sum of the following:	
*	(Armor Rating) squared
*	(fastest movement speed in kph ÷ 25†) cubed
*	(sum of speeds of all other movement types in kph ÷ 6) squared
*	(Space acceleration, in MP) squared
If the vehicle has the Flight movement system, the Defense Multiplier is equal to the sum of the following:	
*	(Armor Rating) squared
*	((Flight Speed - Stall Speed) in kph ÷ 125) cubed
*	(sum of speeds of all other movement types in kph ÷ 6) squared
*	(Space acceleration, in MP) squared
Defensive Score = Maneuver Multiplier × Defense Multiplier	

†Ground-only movement divide the speed by 40. Rail-only movement divide the speed by 60.

• Do NOT use the actual Maneuver rating. Instead, look up the rating on the Maneuver Multiplier table and use the multiplier given by the table.

MANEUVER MULTIPLIER

Maneuver Score	Multiplier	Maneuver Score	Multiplier
+3	9	-4	0.333
+2	3	-5	0.286
+1	1.5	-6	0.25
0	1	-7	0.222
-1	0.667	-8	0.2
-2	0.5	-9	0.182
-3	0.4	-10	0.167

THE MISCELLANEOUS SCORE

Specialist vehicles such as scout exo-suits, communication AFVs and the like typically have high Miscellaneous Scores to reflect their unusual abilities. Depending on the scenario played, this can be useful or detrimental.

The formula on the next page produces the vehicle's Miscellaneous Score. The vehicle's total actions are used in the formula, not just the bonus actions. The Communication, Sensor and Deployment Ranges should be divided by the correct factors before squaring or cubing them. If the sum of the Sensor and Communication ratings is negative, the square value will also become negative (for example, a total of -3 would be squared to 9, which would then become -9). The Perk/Flaw Point Totals referred to in the formula are the total cost points for all of the vehicle's Perks and Flaws, respectively.

□ CALCULATING THE MISCELLANEOUS SCORE

The Miscellaneous Score is equal to the sum of the following*:

•	(Total Actions) cubed
•	(Communication Range in km + 10) cubed
•	(Sensor Range in km + 2) cubed
•	(Deployment Range in km + 50) squared
•	(Burn Points + 100) squared
•	(Sensor Rating + Communication Rating) squared **
•	(Perk Point Total) squared - (Flaw Point Total) squared

*The Miscellaneous score has a minimum value of zero; **If both values are negative, the square becomes a negative value.

▼ CALCULATE DEFAULT SIZE AND COST

A basic Default Size and cost are determined to have base values to work with. The Default Size of a vehicle is calculated using the following formula. The Default Size should be rounded to the nearest whole number.

□ DEFAULT SIZE AND COST

•	Default Size = Cube Root (Final Threat Value)
•	Default Cost (in Credits) = (Final Threat Value) x 1000

▼ CALCULATE PRE-PRODUCTION COST

The vehicle does not have to be the size generated by the calculations. It may be as large as twice the Default Size score or as small as one-fifth the Default Size score. There is no Threat Value modifier involved in changing sizes because the advantages and disadvantages tend to cancel out. For example, a smaller vehicle will be easier to transport, but a larger one will cause more damage in physical attacks.

If the vehicle is to be made smaller, the Pre-production Cost of the vehicle is equal to the Default Cost multiplied by the old Size rating, divided by the new Size. If the vehicle is to be made larger, the Pre-Production cost is equal to the Default Cost.

□ PRE-PRODUCTION COST

•	Pre-Production Cost = Default Cost x (Default Size ÷ Actual Size)
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▼ SELECT PRODUCTION TYPE

Select the stage of production the vehicle is in. The Production Type will also define how much care is put into each unit built and how many units will be manufactured (the "# Available" column). Prototypes are hand crafted and often one-of-a-kind, making them outrageously expensive. Early production runs often still have a bug or two left in them that has yet to be worked out. Mass production runs produce cheap, reliable machines. Limited production runs improve product quality and increase cost. Scratchbuilt designs are lovingly hand crafted with little or no planning.

Along with production type comes Lemon Rolls, the only random part of vehicle design. If the Gamemaster is designing a vehicle for use in a campaign, he should feel free to ignore Lemon rules or add Defects that he finds appropriate. If designing a vehicle that the Player Characters are building, the Lemon Rolls should be made and enforced.

Note that this table is designed for vehicles of Size 1 to about 25. Larger vehicles, such as spaceships, rarely go past what could be considered the Early Production stage because of their extremely large and complex construction.

□ PRODUCTION TYPES

Model Type	Definition	# Available	Model Dice	Individual Dice
Testbed Prototype	New Tech	1-3	12	2
Early Prototype	New Model	1-5	8	1
Late Prototype	New Model	1-10	4	1
Early Production	New Release	5-100	3	3
Limited Production	High End Model	5-500	1	2
Mass Production	Common Model	100+	2	3
Scratch-Build	Patchwork Mess	1	N/A	10

LEMON ROLLS ◇

Not every vehicle is made the same, even if they are the same make, model and variant. Every once in a while, someone messes up and a lemon is produced. Just how many mistakes get made depends on the model of the vehicle.

In addition to the base model Lemon dice, one die is added for every full five Perks assigned to the vehicle. The dice are rolled normally: for each point over five, a Defect occurs. Fumbles are disregarded and count as ones. When a new model is produced, its model dice are rolled and the defects common to all vehicles of this model are determined. In addition, each individual vehicle gets a set number of lemon dice. Whenever a vehicle of this type is introduced into a game or campaign, its individual lemon dice should be rolled.

Due to the meticulous design and construction of Flight and Space vehicles, they tend to have fewer defects than other types of vehicles. In addition to the basic model Lemon dice, add one die for every ten (10) Perks the vehicle has, instead of the usual 5. Roll once on the Lemon Defect table per defect. If multiple options are available, only one should be selected.

Optionally, any Defect can be refused in favor of choosing the Curse: effectively, the vehicle proves Murphy's Law whenever it is convenient to the Gamemaster. For example, a tank model that gets struck by lightning 10 times more often than other tanks. A stealth submarine whose hull, for some unknown reason, picks up and resonates nearby radio stations. A destroyer which is just plain jinxed ("it's haunted... Yeah, that's it!").

LEMON DEFECT TABLE □

Die Roll	Defect
1	Structural Weakness (-1 Maneuver or -10% to Armor, rounding up)
2	Electronic Glitch (-1 Fire Control or -1 Sensors or -1 Communications)
3	Movement System Defect (-1 Maneuver or -10% Top Speed (min. 1 MP))
4	Vehicle has one Annoyance Flaw
5	Vehicle has additional Flaws totalling -2 or less
6	Vehicle has additional Flaws totalling between -2 and -4

CALCULATE FINAL COST ▼

The Pre-Production Cost of the vehicle is multiplied by the Production Cost Multiplier to obtain the Final Cost of the vehicle.

VEHICLE FINAL COST □

Model Type	Production Cost Multiplier	Model Type	Production Cost Multiplier
Testbed Prototype	x100	Limited Production	x2
Early Prototype	x20	Mass Production	x0.5
Late Prototype	x5	Scratch-Build	x0.2
Early Production	x1		

ASSIGN CREW AND NAME THE DESIGN ▼

All vehicles come with a full crew complement at no point cost, unless the scenario says otherwise. All crew are assumed to be Qualified (level 2 in all relevant Skills). However, it is possible to assign a worse or better crew according to needs. Crew quality modifies both the vehicle's final Threat Value and its cost (extra training is expensive!).

For normal vehicle crews, the skill level listed in parentheses is used for the Piloting, Gunnery and Leadership skills. The crew's Electronic Warfare and Tactics skill is one level lower. The crews of scout vehicles usually swap their Gunnery and Electronic Warfare skill levels (i.e. EW equals value in parentheses while Gunnery is one lower).

Fill out a vehicle record sheet for the new creation. Christen it with a good-sounding name or identification code and, optionally, write down its history and description. The new vehicle is ready for battle.

CREW SKILL MULTIPLIERS □

Crew Skill Level	Multiplier	Crew Skill Level	Multiplier
Rookie (1)	0.25	Legendary (5)	6.25
Qualified (2)	1	Legendary (6)	9
Veteran (3)	2.25	Legendary (7)	12.25
Elite (4)	4	Legendary (8)	16

► SPECIAL CASES

The Mechanical Design System is very exhaustive: it allows the creation of any type of vehicles and objects, from a bicycle to a gun emplacement to a huge spaceship. However, since the scale of the system is somewhat large to accommodate all those vehicles' different sizes, the smaller ones tend to suffer from a certain lack of detail. Other, more specialized items require additional explanations and special case rules.

This section explains how to design small vehicles (anything between Size 1 and 5), very large vehicles (above Size 30), emplacements, and robots.

▼ SMALL VEHICLES

Small scale vehicles (Size 5 and smaller) are easy to define using the normal rules. All that is required is a bit of ingenuity and a change of perspective. The Silhouette vehicle design system uses a set of mathematical formulas to compute the size, cost and effectiveness of a given vehicle based on its chosen capabilities. By adding decimals to the statistics and using them in the design formulas, an accurate and more detailed pattern will emerge just like the other, larger, vehicle types.

◇ SIZE

The main adjustment for small vehicles lies in the Final Size decided upon. Since the normal Size values cover quite a broad range of weights to choose from, they have been subdivided into smaller ranges for convenience. The Size value provided by that table is used in the TV calculations as usual, complete with the decimals.

▣ SMALL SCALE SIZE-TO-MASS CHART

Size	Mass in Kg	Size	Mass in Kg	Size	Mass in Kg
0.1	0-8	2.1	301-380	4.1	2401-2600
0.2	9-16	2.2	381-460	4.2	2601-2800
0.3	17-24	2.3	461-540	4.3	2801-3000
0.4	25-32	2.4	541-620	4.4	3001-3200
0.5	33-40	2.5	621-700	4.5	3201-3400
0.6	41-48	2.6	701-780	4.6	3401-3600
0.7	49-56	2.7	781-860	4.7	3601-3800
0.8	57-64	2.8	861-940	4.8	3801-4000
0.9	65-72	2.9	941-1020	4.9	4001-4200
1.0	73-80	3.0	1021-1100	5.0	4201-4400
1.1	81-102	3.1	1101-1230		
1.2	103-124	3.2	1231-1360		
1.3	125-146	3.3	1361-1490		
1.4	147-168	3.4	1491-1620		
1.5	169-190	3.5	1621-1750		
1.6	191-212	3.6	1751-1880		
1.7	213-234	3.7	1881-2010		
1.8	235-256	3.8	2011-2140		
1.9	257-278	3.9	2141-2270		
2.0	279-300	4.0	2271-2400		

◇ MOVEMENT AND MANEUVER

Small vehicles use the standard movement types with no modification to cost or capabilities. Man-worn exo-suits always use the Walker movement system. Speed is expressed in kilometers per hour, just like all other vehicles. To get the speed in meters per roleplaying turn (6 seconds), the speed in kilometers per hour is multiplied by 1.65, rounding to the nearest whole number.

Small vehicles are generally more nimble than larger ones and their Maneuver Attribute should reflect this. Generally, small vehicles will not have a Maneuver of less than -3.

◇ ELECTRONICS

Small vehicles use the same Sensor, Communication and Fire Control Attributes as their larger brethren. Because of the limited internal space available, however, less equipment is generally carried. Sensor and Communication scores tend to be a bit lower (-1 or -2), but do not have to be.

ARMOR ◇

Small vehicles may have Armor ratings based on the Personal scale rather than the Vehicle scale. When this is the case, the Personal-scale Armor rating is divided by ten for Threat Value (TV) calculation. In tactical battles, it is also divided by ten, but is rounded to the nearest whole number. For example, an exo-suit could have an Armor rating of 45 on the Personal scale. This would translate to an Armor rating of 4.5 for TV purposes, and 5 for tactical battles.

SMALL SCALE WEAPONS ◇

Small scale weapons can also be designed using the standard formulas. Again, decimal values are used for extra detail. Vehicular weaponry causes ten points of Personal-scale damage per point of Vehicle scale damage.

For example, a machinegun carried by an exo-suit could have a Damage Multiplier of x22 in personal scale. This will translate in the design formula as a Damage Multiplier of 2.2 (22 divided by ten). The minimum vehicular damage caused by a weapon is always equal to one — it is not possible to design a vehicle-mounted weapon causing less damage than ten points on the personal scale.

LARGE VEHICLES ▼

Just like small vehicles, large vehicles can be built with specialized rules to better represent their capabilities and peculiarities. This section explains how to design large vehicles (anything above Size 30).

Large vehicles can be built as one large structure, but they are most often broken down into smaller parts to facilitate construction, reduce costs and increase their survivability. In **Silhouette** terms, this means that the vehicle is composed of a main hull, which may have the primary movement system(s), plus a number of superstructures and components that perform certain function and are "towed" by the main hull. Examples of this include weapon turrets, communication towers, drive units, etc. For the sake of simplicity, these are referred to as "sections" in the text.

SIZE ◇

The main adjustment for large vehicles lies in the Final Size. Movement systems are generally designed into the main hull, which is then used to "tow" the rest of the vehicle. The true Size of the overall vehicle (for collisions, physical attacks and transport) is thus the total of the mass of the main hull *plus* the respective masses of the sections added to it. This must be remembered if the vehicle is to tow or carry anything.

CREW ◇

Each section requires at least one crewmember, either human or computer. Actions are determined separately for each part of the vehicle, including the main hull. Crew casualties are likewise applied to each separate section as damage is received.

Crew may be reassigned to other sections. A number of crewmembers equal to the Size of the smallest section involved in the exchange may be transferred each turn. Transferred crewmembers do not count for action purposes in the round during which they are transferring.

MANEUVER ◇

Large vehicles are generally slower than small ones and their Maneuver rating should reflect this. Generally, large vehicles will not have a Maneuver of more than -3. All sections must have the same Maneuver rating as the main hull. They use the same movement modifiers in combat (e.g. if the main hull is moving at Combat speed, each section will be treated as moving at Combat speed).

Sections ignore any Maneuver-related damage result, but still lose Armor points as usual (1 for Light damage, 2 for Heavy damage). They are affected by any Maneuver damage suffered by the main hull.

MOVEMENT ◇

Only the main hull (and additional motive sections, if present) needs movement system(s). Other sections do not need movement systems but still have connections to the main hull to benefit from its movement — they may not take the "No Engine" Flaw or any other movement-related Perk or Flaw. Sections ignore any Movement-related damage result, but still lose Armor points as usual.

The exception to this is additional motive sections. These contribute motive power by adding their total mass to define a common "towing capacity." This is then used to tow the rest of the vehicle (the main hull simply adds its own MPs). Obviously, all motive sections must use the same movement type. If a motive section is Overkilled or can no longer supply any motive power, the speed drops; the remaining motive sections' speed is rechecked according to the towing rules.

◇ ELECTRONICS

The electronic systems (Sensor, Communication, Fire Control) are distinct for each part of the vehicle. Thus, if the hull carries no weapons it can have a Fire Control rating of -5, while the turrets have a standard Fire Control of 0. A communication tower could have a very high Communication rating but not much else.

Some sections can dispense with Sensors, but they all need a Communication system to connect with the rest of the vehicle. Should it be destroyed, that section is cut off and may not receive orders from (or supply them to) the rest of the vehicle. It cannot benefit from Command points or transfer crew unless a messenger physically fetches them (that crewmember does not count for any actions while he is away from his post).

◇ ARMOR

Armor is placed as normal on the main hull and components. Each section has its own Armor rating and takes damage separately. Should a section be Overkilled, any remaining damage is applied to the Armor of the main hull to see if additional damage is suffered. If the main hull is Overkilled, each section still has power for a number of turns equal to its Size, after which they lose all power and become inactive.

For example, a turret section with an Overkill value of 72 takes a critical blow from a powerful laser beam and suffers 110 points of damage as a result. The Overkill result automatically destroys the turret, while the remaining 38 points of damage are transferred to the hull.

◇ WEAPONS

The weapon and ammunition carrying capacity of each section depends on its Size, as normal. Extra ammunition may be stored in other sections, but must be physically transferred. A section is considered fixed in place. If the design calls for a turret, the weapon is bought with the Turret fire arc as normal. Fixed arcs are also possible.

▼ EMPLACEMENTS

Buildings and general structures such as roads and bridges are assigned Damage Point Capacities rather than an Armor rating (see *Urban Terrain*, page 88). These structures take damage by ablation rather than by Light or Heavy damage effects. It is possible to mount systems and weapons on these basic structures to give them additional capabilities: these are referred to as emplacements.

Emplacements are designed using the same system as vehicles, with a few limitations. They have a maximum Size rating of 15 (25 when added to Dense Urban structures). Their movement is always equal to zero, and their Maneuver value is equal to -10 for calculation purposes. Their defense roll will always be equal to zero — a gun emplacement does not dodge. Emplacements always benefit from the Stationary attack modifier (+2). Gun emplacements ignore any Movement or Maneuver-related damage result, but still lose Armor points as usual (1 for Light Damage, 2 for Heavy Damage).

Emplacements don't have to make room for components such as an engine, transmission or control systems, so they have more internal space to devote to weaponry and ammunition. They count as being five Size points larger than their actual Size for weapon and ammunition Size requirements. The Deployment Range shows how many hours of power are stored in their internal reserves.

▼ ROBOTS

The vehicle design system can also be used to create any kind of robots or mechanical life form the game requires. For the brave of heart, it can even be used to design robotic characters. Robots can be built into any form one might think of. Just like a vehicle, they have Armor, Maneuver, Speed, etc. Most of these numbers relate directly (or almost directly) to a human Attribute, so using robots in a roleplaying environment is generally not a problem. The mental Attributes of their onboard computer "brain" (Creativity and Knowledge — plus Willpower and Psyche if applicable) are also directly equivalent to human mental Attributes.

□ HUMAN/ROBOTS EQUIVALENCIES

Robotic Attribute	Human Attribute	Robotic Attribute	Human Attribute
Threat Value	Character Points	Communication System	N/A
Size	Build	Fire Control	Agility/Perception
Movement Type(s)	Walkers	Armor	Stamina
Combat Speed	Jogging Speed	Deployment Range	Fitness
Top Speed	Sprinting Speed	Computer Attributes	Mental Attributes
Maneuver	Agility	Modules	Skills
Sensors	Perception		

THREAT VALUE ◇

The total Threat Value of the robot roughly indicates how many Character Points it is worth, allowing balance with various other characters. Robots will tend to be more powerful than humans, but less flexible. In the **Jovian Chronicles** universe, the Edicts have practically stopped research into artificial intelligence. Other campaign worlds may have access to a higher technology and feature robots that are human-like in their mental capabilities.

Threat Value points have no direct conversion to Character Points because the physical performance variation between two humans are generally too small to register on the vehicle scale. As a rule of thumb, 30 TV points will result in a humanoid robot that is roughly equal to an average human in terms of physical capabilities.

SIZE ◇

Robots can be built to any size, but most of them will weigh in at less than a ton (Size 3 or less). The use of the Small Vehicle Size Table (page 108) is highly recommended. By cross-indexing the weight with the Build table, one can determine the Build Attribute of the robot if it is required (for example, if the robot is to use tools or vehicles built to accommodate human beings of a certain size).

MOVEMENT AND MANEUVER ◇

Humanoid robots automatically use the Walker movement type, but robots can use practically any movement type the designer chooses. In fact, most robots will have a movement type that is most suited to the task(s) they have been designed to fulfill. Multiple movement systems are also possible.

The Maneuver Attribute covers the robot's natural agility and response speed. It is roughly equivalent to the human Agility Attribute and is used in the same way.

ELECTRONICS ◇

The Sensor Attribute of the robot is the equivalent of the human Perception Attribute and is used the same way. Robots often have a built-in communication system, although it is not mandatory. If the robot does not carry one, it should have the "No Communication System" Flaw. Obviously, there is no human equivalent to this Attribute.

Fire Control defines the robot's ability to use ranged weaponry, whether built-in, carried or vehicle mounted. The closest human Attribute would be an average of Agility and Perception (which are used for personal weapons and vehicular weapons, respectively).

ARMOR ◇

Robots use Armor instead of Stamina. Their Armor ratings are normally based on the Personal scale rather than the Vehicle scale: the Personal-scale Armor ratings are divided by ten for Threat Value (TV) calculation. In tactical battles, it is also divided by ten, but rounded to the nearest whole number.

DEPLOYMENT RANGE ◇

The Deployment Range's closest human Attribute would be the Fitness Attribute. Machines do not tire, however, so they do not have a Fitness rating. Robots have a Deployment Range which represents the maximum distance they can cover before needing a recharge or other maintenance, depending on their design. To determine the operating time in hours rather than distance, divide the Deployment Range (in km) by the Combat Speed of the robot. Immobile robots may use the Deployment Range directly, with one hour equal to one "kilometer."

COMPUTER ATTRIBUTES ◇

Robotic brains are built using the Computer Perk. It might be possible for a robot to be designed with an Artificial Intelligence Computer, gaining Willpower and Psyche Attributes just like human characters. Refer to the *Computers* chapter, page 136, for the computer rules.

MODULES ◇

Modules are programs that serve as the computer equivalents of skills. Unlike skills, which are "fixed," modules can be loaded as needed (see *Computers*, page 136). A number of Modules equal to the square of the Processing Power may be carried in the memory of the machine, although only a limited number may be run at any one time, depending on the computer's Processing Power.

► PERKS

Many vehicles have special features, such as ejection systems and cargo bays, that are not covered by the vehicle's tactical and strategic statistics. These features are represented by Perks. Many Perks are primarily intended for background and roleplaying purposes and do not have significant tactical effects.

Perks which have an "AUX" icon are defined as Auxiliary Systems for damage purposes. Perks which have an "R" icon have a Rating associated to them.

R

● ABLATIVE ARMOR

COST: PER DEFENSE ARC × RATING 2 ▼

One (or more) facing of the vehicle is covered with a special armor plating which shatters under kinetic stress or vaporizes when hit. This absorbs incoming damage, but the ablative armor must invariably be replaced after each battle. The maximum amount of ablative armor that may be carried is equal to half the Armor rating of the vehicle, rounded down. Each defensive arc (Front, Sides and Rear) must be protected separately.

When the vehicle is hit, the current Perk rating is added to the Armor rating of the vehicle. Ablative armor automatically loses 1 point from its rating per ten points of damage every time it is hit. This is in addition to the normal Armor damage of the vehicle, if applicable. The Ablative Armor loses points on every hit of ten or more points of damage, whether the attack inflicts a damage result to the vehicle or not.

● ACCELERATION PROTECTION

COST = 1 ▼

Aircraft and spacecraft with this Perk have been modified to reduce the strain of acceleration on its crew, either through special cockpits, G-seats or advanced flight suits. Crew have a +1 bonus whenever they have to make a FIT roll due to sharp turns or other effects of acceleration. Only Flying and Space vehicles can take this Perk.

● ADVANCED CONTROLS

COST = SPECIAL ▼

The vehicle has a very advanced, user-friendly control interface. The great ease of its use allows the vehicle to have one extra action each combat round, regardless of the number of crewmembers aboard. Advanced Controls do not have a regular Perk cost — rather, they add one to the number of actions supplied by the crew for calculation purposes.

● AIRODROPPABLE

COST = 4 ▼

This Perk is added to vehicles that will be parachuted in by airborne units. The vehicle is equipped with a parachute or an equivalent device that allows it to be dropped from high altitude onto a battlefield. The suspension and drive train have been specifically designed to absorb the shock of landing without suffering damage. See *Airdropping*, page 76.

● AIRLIFT READY

COST = 1 ▼

The vehicle is equipped with quick-connect hardpoints and is reinforced in a manner that makes it easy to airlift by VTOLs. Airlifting can be used to deploy a vehicle rapidly or to allow it to cross major obstacles. An airlift-ready vehicle can be prepared for take-off in half the time normally required to do so. See *Airlifting*, page 76.

AUX

● AIRLIFT WINCH

COST = RATING ▼

R

The aircraft is equipped with a rugged system which enables it to airlift troops and/or cargo without having to land. The Perk's rating gives the maximum number of troops that can be airlifted in a single Air War round, or the maximum Size of any airlifted cargo. The Perk rating cannot be higher than half the Size of the aircraft. The vehicle has to be stationary and at altitude level 0. Only VTOL Flying vehicles can take this Perk.

● AMMO/FUEL CONTAINMENT SYSTEM

COST = 4 ▼

The vehicle's ammunition and fuel bays are reinforced and equipped with blast-control panels. The system completely absorbs the first hit when an "Ammo/Fuel Hit" result is obtained on the Fire Control Damage Table — there is no further damage beyond the lost Armor points. The Perk is then destroyed. The Perk's effect can be restored by normal repair if a technician works on the vehicle after combat.

● AMMO STORAGE

COST = 1 PER 20 TV POINTS OF AMMO STORED (ROUNDED UP) ▼

The vehicle is equipped to store some or all of its spare ammunition clips in an armored compartment to protect them against damage. If there is no Manipulator Arm or ammo-reloading Tool Arm mounted on the vehicle, the crew must reload the weapon manually, at a rate of one shot per action. The clips are not counted as an AUX systems and can only be destroyed when actually in the weapon. The cost is one point per ten TV points of ammunition stored, regardless of how they are divided into clips.

AUX

● AMPHIBIOUS

COST = 3 ▼

The vehicle is adapted for occasional water travel such as river crossings and aquatic assaults. The vehicle is amphibious, but is not intended for extended water activity. In the tactical game, the vehicle may travel across Water hexes, paying MP according to its normal movement type (not as a Naval vessel). This Perk does not grant the Submarine movement. The Amphibious Perk is only available to Walker and Ground vehicles.

AUX

● AQUATIC SENSORS

COST = 2 (IF ONLY AQUATIC); 2 + 1/2 OF RANGE OF AQUA. SENSORS (IF NORMAL + AQUATIC) ▼

The vehicle is equipped with underwater sensors such as sonar, magnetic anomaly detectors and specialized cameras. A vehicle may be equipped with aquatic sensors in addition to its normal sensors, or it may be equipped exclusively with aquatic sensors. The latter use the sensor range that would have been used by their "normal sensors." Vehicles with both must specify the range of both types of sensors.

In tactical terms, the vehicle ignores Water terrain Obscurement while in water itself. Some vehicles have aquatic sensors that do not need to be immersed in water to function. They must be within a minimum distance (often under a kilometer) from the body of water they wish to scan, however. If aquatic sensors can be used out of water to detect targets in water, an additional +1 is added to the cost per 100 m (2 tactical hexes) of distance this ability extends to.

AUX

COST = 2 ▼

COST = 5 ▼

COST = 2 ▼

COST = 5 ▼

COST = 12 ▼

COST = 0.2 X RATING FOR EACH ARM ▼

COST = 1 \ (VOLUME IN CUBIC METERS) ENCLOSED, 1 \ (SURFACE AREA IN SQUARE METERS) 10) OPEN ▼

AUX

R

● COMPUTER

COST = (RATING²) X ATTR. MULTIPLIER (FLEXIBLE), 0.5 X (RATING²) X ATTR. MULTIPLIER (HARDWIRED) ▼

The vehicle has a built-in, general use computer in addition to the computers used to control the vehicle. While it is primarily a roleplaying tool, players can use the computer in tactical combat, using Modules such as Electronic Warfare, Fire Control and Pilot to assist the crew. The Perk's rating is the Processing Power of the computer. This is squared and multiplied by the Attribute Multiplier (see table) to get the cost. It should be rounded to the nearest whole number. Hardwired computers are designed for a specific module and module level, and their programming cannot be changed. As a result, they are cheaper.

Instead of being equipped with an ordinary computer, the vehicle may have a sentient Artificial Intelligence: it is thus capable of independent action and decision making. Each AI computer counts as a separate crew and gets its own actions and penalties. No live crew need be added. Neither type of computer is affected by "Crew" hits. See Computers, page 136, for the complete rules and descriptions of Modules.

■ ATTRIBUTE COST MULTIPLIER

•	If AvgAtt > 0, Attribute Multiplier is (AvgAtt+1) ²
•	If AvgAtt = 0, Attribute Multiplier is 1
•	If AvgAtt < 0, Attribute Multiplier is 1/(AvgAtt+1)

AvgAtt is the average (rounded to the nearest whole number) of the Creativity, Knowledge, Willpower and Psyche Attributes.

AUX

● COUNTER-BATTERY SENSOR

COST = 4 + RATING ▼

R

A Counter-Battery Sensor (CBS for short) is a set of specialized radar and sensors designed to locate an enemy artillery unit based on the trajectory and signature of its fire missions. When an indirect fire attack is incoming, an attempt can be made by any CBS-equipped unit within half sensor range of the target hex to locate the attack's origin, allowing effective counter-fire. Activating the CBS costs one action. The operator "attacks" the enemy unit using Electronic Warfare as the skill and the CBS as the weapon. The opponent must reveal in which range band the firing unit is located. The CBS's Base Range is equal to its rating; it has +0 Accuracy and does no damage.

A successful roll locates the last known firing position of the firing unit. Obviously, if the enemy battery moved after firing, the information is much less valuable. A failure does not yield any information. On a fumble, the operator gets a phantom echo — any counterattack automatically deviates by a number of hexes equal to the result of three dice, added together.

AUX

● DECOY SYSTEM

COST = RATING (VISUAL ONLY), RATING (SENSOR ONLY), RATING SQUARED (VISUAL AND SENSOR) ▼

R

A Decoy system allows a vehicle to project phantom images of itself or another object by using inflatable decoys, holography or electronic signal imaging technologies. In tactical game terms, the Decoy system can create as many false images as its Rating. The attacker must make a Notice Skill check (if playing a purely tactical game, replace this by an Electronic Warfare Skill test) against the Rating with a modifier of -3 in order to hit the correct target. Both Sensor and active ECCM system add their Rating to this roll.

Visual decoys only affect visual detection and are automatically identified as decoys by Active Sensor rolls. It is also possible to create false sensor targets with no visual images — these are automatically identified as phantom echoes once in visual range, but have their rating boosted by the rating of active friendly ECM. More advanced decoys can imitate both the visual aspects and the sensor signature of the vehicle they emulate. Guided, Smart and Sensor-homing weapons are just as likely to go for a sensor decoy, though they won't be fooled by a visual one.

● DIVING WINGS

COST = 2 ▼

Fixed wing aircraft with this Perk have their wings in a distinctive shape which enhances its ability to pull out of a dive. Any such plane gives a +1 bonus on Piloting Skill rolls for pulling out of Dives, Stalls or uncontrolled falls. Only Flying vehicles can take this Perk.

● EASY TO MODIFY

COST = 2 PER SUBASSEMBLY, 9 FOR THE COMPLETE VEHICLE ▼

Easy to modify vehicles feature standardized parts and modular aspects. While this type of design is a joy to service or modify and often lasts longer in the field, it is generally more difficult to design. They rarely have many other innate features and are usually modified whenever any new functions are needed.

One (or more) of the vehicle's subassemblies is designed in such a manner as to be easy to repair or replace. +2 is added to all technical skill rolls to modify and repair this particular subassembly of the vehicle. The subassemblies covered by this Perk are: Movement, Structure, Fire Control and Auxiliary Systems.

AUX

● EJECTION SYSTEM

COST = TOTAL # OF ACTIONS DUE TO CREW (EJECTION SEATS) X 2 (ESCAPE PODS) ▼

The vehicle is equipped with an ejection system to give the crew a chance to escape if the vehicle suffers an Overkill damage result (or before that, if desired). See Ejection (page 159 of the rulebook) for more details. This Perk also covers the various pieces of survival equipment such as life preservers and inflatable lifeboats on marine vehicles. Very few ground vehicles have ejection systems — if the crew is unable to crawl out of their vehicle, they are probably dead already.

An ejection seat is designed to get a crewmember away from the craft to avoid being caught in any explosion which might result. A parachute (in atmospheric operations) or a rescue beacon (in space) allow for a safe rescue, although with little control over which hands the person falls into. An ejection pod is a self-contained life boat for air and space vehicles which allows for a limited amount of maneuvering and for re-entry to a planet's atmosphere. Its naval equivalent is the inflatable life raft.

AUX

● ELECTRONIC COUNTER MEASURES

COST = RATING X 2 ▼

R

Electronic Counter Measures (ECM) are devices that are used to jam sensors and communication systems. ECM is especially useful to prevent forward observing and drone operations. Rules for using ECM systems can be found on page 151 of the **Jovian Chronicles** rulebook. ECM range is identical to the vehicle's Sensor range.

● **ELECTRONIC COUNTER COUNTER MEASURES**

COST = RATING X 2 ▼

AUX
R

Electronic Counter Counter Measures (ECCM) are devices that are used to block jamming systems and/or punch through their effects. Using ECCM to prevent jamming requires one action. Rules for using ECCM systems can be found on page 151 of the **Jovian Chronicles** rulebook. ECCM range is identical to the vehicle's Sensor range.

● **EMERGENCY MEDICAL**

COST = 1 X NUMBER OF CREW ACTIONS, 0.1 X NUMBER OF PASSENGERS ▼

This Perk includes features like instant casts for broken limbs and stimulant/pain-killer injections to prevent loss of consciousness. In tactical game terms, this Perk cancels one "Crew Stunned" result on the Systems Damage table. In roleplaying terms, the vehicle will prevent the character from losing consciousness due to his injuries. In addition, the emergency medical features will prevent wound degeneration for up to one full day. Not all personnel need be equipped with the system.

● **EMERGENCY POWER SURGE**

COST = (RATING) ▼

AUX
R

Emergency Power Surges (EPSs) systems are a rare feature. A vehicle with this Perk can, for a short time, boost its statistics by unleashing emergency capacitors, nitro injections, etc. In game terms, the EPS system "spends" its rating points to gain a set of benefits.

This allows the vehicle to increase one of the following attributes by one for a single combat round per rating point spent: Maneuver, Top speed MP, number of actions, weapon Damage Multiplier or weapon Base Range. Each attribute can be raised up by a maximum of three points (so the maximum EPS points usable during a single round is equal to 15). A vehicle could spend all of its rating points in one round for one glorious burst of power, or it could conserve the points for emergencies.

It is also possible to "overburn" the EPS system, doubling the effects but damaging the vehicle. If this option is used, each EPS point counts as two, but the system affected drops by one point afterward. If actions drop below zero, the vehicle must "buy" back the penalty before applying the action. For example, a one-man vehicle at -2 actions would have to take extra actions (and associated penalties) to act.

EPSs burn themselves out during use. Therefore, they do not regenerate their rating. EPS repairs usually require complete vehicle overhauls. EPS use must be declared during the declaration phase and does not require an action.

● **FIRE RESISTANT**

COST = 8 ▼

The vehicle is made of fire-resistant materials and provides adequate heat protection for the crew. In game terms, the Intensity of any flame attack against the vehicle is halved before damage is determined.

● **FUEL EFFICIENT**

COST = 2 FOR ONE AND A HALF TIMES THE RANGE, 4 FOR TWICE, 8 FOR THREE TIMES ▼

The engine and systems of the vehicle are extremely efficient: a greater deployment range than normal is possible. As long as the vehicle remains at Combat Speed, each point of Deployment Range provides more kilometers of distance. One and a half, twice and three times the range are possible multipliers.

● **GLIDER**

COST = 2 ▼

Aircraft with this Perk possess the abilities of a thermal glider and only lose one altitude level or MP of speed when gliding. In addition, the pilot can ride hot air currents to actually gain altitude levels, by making a Piloting roll versus a threshold of 5. Each point of Margin of Success allows the craft to gain one altitude level, without losing speed. This Perk can only be taken by Flying vehicles.

● **GUN PORTS**

COST = 1 (ONE-THIRD OF THE CREW AND PASSENGERS), 2 (HALF THE CREW AND PASSENGERS) ▼

The vehicle is equipped with gun ports from which the crew and passengers can fire small arms while retaining the protection of the vehicle's armor. Only small arms may be fired from gun ports, not heavy weapons. Because of the design of the gun ports, the weapon is restricted to a "Fixed" firing arc and has a -1 modifier to hit in addition to the vehicular movement modifiers.

● **HAYWIRE RESISTANT**

COST = 10 ▼

The vehicle is specially designed to shrug off massive electrical charges through isolated circuitry and grounded structure. This Perk allows the vehicle to reduce the effects of weapons with the "Haywire" characteristic. On a Light Damage result, the second damage roll is ignored. On Heavy Damage results, the second damage roll is treated as a Light Damage roll instead of a Heavy one.

● **HEAT RESISTANT ARMOR**

COST = RATING ▼

AUX

The vehicle's armor is designed to deflect and dissipate the intense energy delivered by weapons like shaped-charge warheads, particle beams and lasers. Although all armored vehicles have some degree of HEAT resistance built into their armor plating, many frontline combat vehicles have an extra layer of ceramic/ablative armor to help them fend off Monroe-effect warheads and energy weapon beams.

The maximum rating is equal to half of the vehicle's base Armor rating (rounded down). This rating is added to the vehicle's base Armor rating when the vehicle is attacked by HEAT-based weapons. This Perk has no effect versus weapons that are not HEAT-based (this is determined during weapon design — see page 133).

● **HIGH TOWING CAPACITY**

COST = 5 (DOUBLE) OR 15 (TRIPLE) ▼

The vehicle is equipped with a high torque, heavy duty powerplant and transmission. Its towing capacity is doubled (or tripled, depending on the option chosen). If the vehicle has the "Walker" movement type, this Perk provides heavier actuators and power systems to give more power to the lower limbs. This yields higher damage in combat from kicks and stomps — add one to the kicking Damage Multiplier for double towing capacity, and two for triple towing capacity.



AUX
R

• HOLOFIELD

COST = RATING X 2 ▼

The holofield allows a vehicle to blend in to its surroundings by using both limited scope holography and photoskin technology; it is the visual equivalent of the Stealth Perk. In tactical game terms, the holofield adds its Rating to the vehicle's Concealment at all time. It only affects visual detection and does not affect Active Sensor rolls.

• HOSTILE ENVIRONMENT PROTECTION

The vehicle is specially designed to survive undamaged for prolonged exposure to some hostile environmental conditions. Though this is mostly a roleplaying consideration, some tactical rules require specific environmental protections in certain types of terrain and weather (see Chapter 5 for more information). This Perk is noted "HEP: <chosen environment>" on the vehicle sheet. The following options are available.

• HEP: DESERT

COST = 1

The vehicle can withstand extended exposure to desert conditions without needing special maintenance to avoid sand build-up. This Perk includes air filters, modified heat exchangers, and cloth coverings on delicate mechanisms.

• HEP: EXTREME HEAT

COST = 4

The vehicle is designed to withstand exposure to scorching temperatures, often well into the hundreds of degrees Celsius, without taking severe damage. If combined with the Fire Resistance Perk, the vehicle is effectively immune to incendiary attack.

• HEP: EXTREME COLD

COST = 1

The vehicle is designed to endure freezing cold temperatures, such as those found in Earth's arctic and antarctic regions, without freezing up or otherwise breaking down. Heaters, special lubricants and other modifications are part of this Perk.

• HEP: HIGH GRAVITY

COST = 1

The vehicle is designed to withstand very high gravity environments (3 gees+) for extended periods. This does not, however, guarantee that the crew can do the same.

• HEP: HIGH PRESSURE

COST = 4 (HIGH PRESSURE), 10 (EXTREME PRESSURE)

The vehicle is designed to endure the great pressures of locations like ocean depths and the upper layers of gas giants. A variant of this Perk (Extreme Pressure) allows the vehicle to endure even the most extreme pressures, such as those found in the deepest of ocean depths or within the atmosphere of gas giants.

R

• HEP: RADIATION

COST = RATING

The vehicle is designed to withstand high radiation levels. Foamed armor, rad-absorbing gel layers and additional shielding protects the vehicle's sensitive systems (especially the crew). The rad protection level, in rads/hour, is equal to ten to the power of the rating (e.g., a rating 3 system would give 10^3 or 1000 rads/hour of protection).

• HEP: UNDERWATER

COST = 2

The vehicle can withstand full submersion in water and other fluids, up to a depth equal to five times the vehicle's Armor rating in meters (multiplied by five when combined with High Pressure, multiplied by twenty with Extreme Pressure). Vehicles capable of Submarine movement automatically possess this Perk at no cost.

• HEP: VACUUM

COST = 1

The vehicle is designed to withstand the lack of pressure found in vacuum environments. All hatches and access points are equipped with airlocks, the hull or crew compartment is pressurized, and so on (a life support system must still be bought separately, though). This Perk does not, however, grant a vehicle the ability to perform atmospheric re-entry (which is a separate Perk).

• HEP: ALL

COST = 12

The vehicle is designed to withstand anything thrown at it. It can go over land, in space, underwater, etc. It possesses all the above abilities at no additional point cost, except Radiation and Extreme Pressure protections (which must be bought separately).

• IMPROVED OFF-ROAD ABILITY

COST = 9 ▼

The vehicle is designed to handle rugged terrain even better than standard military grade ground vehicles. Ground vehicles have massive wheels or treads. Hover vehicles can vary how high they float off the ground and have improved hazard detection systems to avoid pitfalls and rough ground. Walkers have powerful legs and wide, high traction feet that allow them to run efficiently even when trudging over sand or through swamps.

In tactical game terms, the vehicle pays one less MP for any terrain type that requires more than one MP. For instance, a Ground vehicle with Improved Off-Road Ability would pay 3 MP instead of 4 MP when crossing Swamp hexes, but would still pay 1 MP per Clear or Sand hex. The Perk must be bought separately for each movement type.

• IMPROVED REAR DEFENSE

COST = 10 ▼

It is normal for combat vehicles to have thick front plates and weaker rear plates, since most attacks will normally come from the front. Vehicles with this Perk have a well-defended rear arc, either through a superior armor design or additional sensor systems. In game terms, this reduces the defense roll penalties from Rear and Rear Flank attack by one. In other words, the Rear Flank arc of defense penalty is 0 and the Rear arc of defense penalty is -1.

LABORATORIES

COST (PER LAB) = 5 + (10 X RATING) ▼

AUX
R

Some vehicles are equipped with "laboratories;" systems that help the crew in specialized tasks. Each laboratory is dedicated towards one particular Skill or Skill specialization. Combat skills (including all Piloting/Driving and all Gunnery) may not have labs, as they are covered by other vehicular systems. Laboratories are rated upon their quality (minimum of 0). This quality rating is added as a modifier to any test performed using the laboratory's skill. Laboratories eliminate any penalty due to missing tools and proper equipment. They can be used to represent specialized rooms such as tactical command centers (Leadership), galleys (Cooking) or even theaters (Theatrics).

LARGE DOORS

COST = 1 ▼

The vehicle's crew and passenger compartments are equipped with oversized doors and hatches that allow rapid egress and ingress. For each action spent, two crewmembers (instead of one, as usual) can exit the vehicle. A number of passengers equal to twice the Size of the vehicle may enter or exit each turn at no action cost.

LIFE SUPPORT

COST = 1 X NUMBER OF CREW ACTIONS (LIMITED); 3 X NUMBER OF CREW ACTIONS (FULL) ▼

AUX

Life support systems provide the vehicle's crew with a sealed and self-supporting milieu, protecting them from hostile environments such as poisonous atmosphere, vacuum and underwater. If this system is destroyed while the vehicle is in a hostile environment, the entire crew immediately become casualties, eliminating the vehicle from combat. All combat vehicles have a basic overpressure system to protect them from most biochemical weapons, so Life Support should be bought only for those vehicles that truly need it.

The limited form of life support includes contingencies for breathing and limited nutritional and excretory needs, and provides support for each crewman only up to the deployment range. The full version of life support includes complete air recycling, proper waste disposal, hygienic and nutritional facilities; it lasts indefinitely for game purposes.

LIGHTER-THAN-AIR

COST = 2 (STANDARD ENVELOPE); 4 (SELF-SEALING ENVELOPE) ▼

Aircraft with this Perk use lighter-than-air gases to stay aloft. Since this uses no Movement Points, Lighter-than-air craft do not fall when their movement systems are disabled or destroyed, though their horizontal movement will be determined by wind alone (see *Wind*, page 90). Lighter-than-air craft can gain or lose one level of altitude per round without using MPs.

Light damage to the Structure will cause a lighter-than-air craft to lose one level of altitude per round, without the possibility to gain them back. Heavy Structural damage will cause a two-level drop per round. The envelope can be designed to be self-sealing; when taking Structural damage, airships with this option will suffer the loss of altitude effect only once instead of every round.

A lighter-than-air craft occupies three times as much space as its Size (for example, a Size 10 lighter-than-air will completely fill a tactical hex). Craft with this Perk are considered VTOL craft for determining admissible Perks and Flaws. Only Flying vehicles can take this Perk.

LOW PROFILE

COST = 2 ▼

The vehicle has a very low profile which make it easier to hide and conceal. Vehicles with this Perk tend to have sloped and compact hulls — for obvious reasons, bipedal walkers generally cannot be designed this way. The vehicle gets +1 to Concealment while in cover (hexes with Obscurement of 2 or more). If the Hull-Down rules are used, it derives an extra 5 points of protection from its position.

LOUDSPEAKERS

COST = 1 ▼

AUX

These are powerful external loudspeakers. These can be used with sirens, audio systems, communication gear, or any other audio equipment.

MANIPULATOR ARM

COST = 0.5 X RATING FOR EACH ARM ▼

R

The vehicle has an arm-like structure that can pick up and manipulate objects. Manipulator Arms are part of the basic layout of practically all exo-vehicles. Small Manipulator Arms can also be installed on any type of vehicle to represent "micromanipulators" used for delicate maneuvers. The arm can lift an object whose Size is equal to or lower than its rating. No matter the rating of a Manipulator Arm, a vehicle cannot lift an item whose Size is greater than twice its own Size. Lifting any mass greater than half the vehicle's own mass will prevent the vehicle from moving. Half the capacity of all weaker arms are added to the full capacity of the strongest arm to determine the lifting strength of multiple arms.

Optionally, Manipulator Arms can be reinforced to punch or crush opponents. These attacks have a Damage Multiplier equal to the rating of the arm. This option adds nothing to the Perk's cost but modifies the Offensive Score (see page 104). For roleplaying purposes, manipulators can apply pressure equal to half their Size rating, rounded up. The highest weight value for that result on the Size to Mass chart is the pressure applied in tons per square meter.

Manipulator Arms can be used for fine manipulations and tasks which require dexterity. A standard Piloting skill test is required, the threshold varying according to the task. In addition, a negative modifier equal to the difference between the object's Size and the hand's rating is applied to the roll. The Size to Mass table helps to evaluate the Size of the object being manipulated.

MINING EQUIPMENT

COST = 5 (LIGHT DUTY); 20 (HEAVY DUTY) ▼

AUX

The vehicle is adapted to perform mining functions. Mining equipment must be specified as either light or heavy duty. Light duty mining equipment consists of one or two sampler arms, a small earth-moving blade (or a more conventional bulldozer blade) and a simple winch with a cable strong enough to move the vehicle. Heavy duty equipment is intended for commercial mining operations: in addition to the aforementioned equipment, it includes a large rock grinder, a shovel arm, one or two trenchers and a drill. Ore conveyors are also fairly common.

The mining equipment can be designed to attack opponents in melee combat. The Damage Multiplier equals half the cost of the mining equipment, rounded up. Light duty equipment has poor (-1) Accuracy and heavy duty equipment has very poor (-2) Accuracy. If selected, this ability modifies the Offensive Score of the vehicle.



• NOE FLYER

COST = 7 ▼

Aircraft with this Perk are equipped with very advanced sensor-assisted flight systems, which allow the aircraft to effectively fly at altitude level zero (NOE, or "Nap-of-the-Earth" flying). This enables the aircraft to avoid most long- and medium-range radars and detection systems by using the ground's surface features to hide behind.

In game terms, the NOE flight system gives a -2 modifier to any roll on the Aircraft Control Loss Table (see p. 148 of the rulebook) if the aircraft is at altitude level zero. When flying at altitude zero, the vehicle benefits from the Obscurement of ground hexes against ground-based detection attempts and attacks (see page 150 of the rulebook). Only Flying vehicles can take this Perk.

• NO FUEL REQUIRED

COST = 10 (PERMANENT POWER); 6 (POWER CAN BE CUT OFF) ▼

The vehicle's main powerplant does not require regular fill-ups with fuel or reaction mass. It draws its energy from the environment around it (a solar-powered or sail vehicle, for example). The vehicle still has to undergo basic maintenance from time to time, though. The Deployment Range Rating represents the interval at which basic maintenance must be performed.

Solar sail and magsail vehicles use this system. The sail itself is so thin (or insubstantial, in the case of the magsail) that it causes no damage to anything that comes into contact with it. Solar sails are damaged as normal during collisions. Sails damaged by any means will reduce the vehicle's thrust by 0.01 MP for each ten points of damage suffered. If the thrust falls under half its normal value, the sail collapses and is unusable. For game purposes, solar and magsails have a diameter equal to half the Size of the vehicle, in kilometers.

• PASSENGER ACCOMMODATIONS

COST = SQUARE ROOT OF [VOLUME IN CUBIC METERS] ▼

The vehicle is equipped with proper living and sleeping quarters. This is a necessity for long range vehicles if the crew and passengers are to remain fresh and alert. There are two quality levels of accommodations available. Military grade accommodations are spartan in design and provide little privacy or comfort. *Luxury accommodations occupy about twice the volume of military accommodations but include private sleeping quarters, a small private lounge, and personal hygienic facilities.* A vehicle with numerous living accommodations of either type also generally includes a few common rooms such as galleys and lounges, and thus most devote more space to accommodations.

Military grade accommodations for one person start at two cubic meters in size, while civilian accommodations can be as big as a thousand cubic meters on very large vehicles. As a guideline, a minimum of 25 cubic meters per person are required for any moderately long occupations. Accommodations can also serve as makeshift cargo bays if the furniture is removed (assume that one person-minute per cubic meter are required for the conversion). The passenger accommodations' volume is added to the vehicle's to get a total volume. Passenger accommodations usually take up a lot of room, but even civilian vehicles can have military-grade accommodations to cut costs. A good example of this is the sleeping cab found behind the driver on many long-haul trucks.

• PASSENGER SEATING

COST = SQUARE ROOT [3 X NUMBER OF PASSENGERS] ▼

The vehicle has extra seats for passengers. The passengers do not confer any extra actions to the vehicle, nor can they control it. They do, however, count as crew for damage purposes (any damage should be randomized between crew and passengers). Passengers cannot use the crew's ejection system (if any); this must be purchased separately, at the same cost as for normal crew. A number of passengers equal to the Size of the vehicle may enter or exit each turn at no action cost, provided the vehicle is moving no faster than 12 kph.

• PINTLE MOUNT

COST = FREE (COST OF WEAPON IS ADDED TO O.S.) ▼

An infantry weapon installed on a swivel mount just outside a hatch is said to be pintle mounted and must be operated by one of the vehicle's crewmen. That crewman can do nothing else and is exposed to enemy fire (count as Partially Exposed Crew, unless the vehicle is already open topped). Pintle Mounts have a 180 degrees arc of fire chosen at the time of design. The weapon is not protected by the vehicle's armor and counts as an Auxiliary system. Fire Control hits neither affect pintle mounted weapons nor does the Fire Control bonus apply to them. Firing penalties are equal to -1 for more than half and up to Combat speed, and -2 for Top speed, in addition to any other modifiers.

Pintle mounts are quite simple and add little to the cost of the vehicle. Any type of infantry weapon can be mounted on them. The cost of the weapon is equal to its DM plus its Base Range plus its ROF in vehicle scale, and is added directly to the vehicle's final Offensive Score.

• RAM PLATE

COST = 4 ▼

Part of the chassis of the vehicle has been specially reinforced to withstand high speed impact. Each ram plate must be assigned to a ramming arc. The vehicle takes only half the normal damage in a collision, provided the impact is in the same arc as the Ram Plate.

AUX

• REENTRY SYSTEM

COST = 4 FOR SINGLE USE; 8 FOR PERMANENT FEATURE ▼

The vehicle has been specially reinforced to withstand the high temperature and stress of atmospheric reentry. Every five turns, the pilot must make a Piloting roll against a Threshold of 2 to keep the craft correctly oriented or suffer one Fire attack as per normal reentry rules (see *Jovian Chronicles* rulebook p. 143). Modifiers due to damage apply in full.

• REFUELING EQUIPMENT

COST = 2 PER REFUELING BOOM; 1 FOR INTAKE AND RECEIVING EQUIPMENT ▼

This Perk allows a vehicle to be refueled on the move. The refueling boom consists of enough equipment to refuel one vehicle at a time. The fuel is usually carried within a cargo bay, but the refueler can use its own Deployment Range or Reaction Mass instead. Both pilots must roll their Piloting skills vs. 4; if either fails, the refueled vehicle takes on only 1d6 x 10% of the intended load. A fumble means a collision occurred, and the refueling equipment on both vehicles is out of service. A refueling attempt may be made every three minutes (6 rounds). Suggested time for total refueling is one round per point of Size of the target (plus the three minutes for hook-up).

R

• REINFORCED ARMOR

COST (PER ARC OF DEFENSE) = RATING ▼

The vehicle has one or more facings (arcs of defense) with better or thicker armor than the rest of the vehicle. When the vehicle is hit in an arc that is reinforced, the rating of this Perk is added to the base Armor rating of the vehicle. Four possible arcs can be reinforced: Front, Rear, Right Rear Flank and Left Rear Flank. Up to three of these arcs can be reinforced on a single vehicle.

● **REINFORCED CHASSIS** COST = 6 ▼

The frame of the vehicle is designed to absorb considerable punishment. The vehicle may ignore the first Structure hit on the Systems Damage Table, but then loses this Perk. The Perk's effect can be restored by a normal repair if a technician works on the vehicle after combat. This Perk may be taken more than once.

● **REINFORCED CREW COMPARTMENT** COST = 4 ▼

The crew compartment is layered with additional armor and fitted with crash-absorbing material. The vehicle may ignore the first Crew hit on the Systems Damage Table, but then loses this Perk. Crew casualties from Structure hits are unaffected, however. The Perk can be restored by normal repair if a technician works on the vehicle after combat. This Perk may be taken more than once.

● **REINFORCED LOCATION ARMOR** COST (PER LOCATION) = 0.5 X RATING, ROUNDED UP ▼

R

One of the vehicle's locations has better armor than the rest of the vehicle. When the vehicle is hit in a reinforced location, the rating of this Perk is added to the base Armor rating of the vehicle before determining damage. This Perk cannot be taken more than twice per vehicle.

● **RUGGED MOVEMENT SYSTEMS** COST = 5 ▼

The vehicle may ignore the first Movement hit on the Systems Damage Table, but then loses this Perk. This protection is due to the inherent strength of the drive system's design, or a built-in redundancy. This Perk's effect can be restored by a normal repair if a technician works on the vehicle after combat. This Perk may be taken more than once.

● **SATELLITE UPLINK** COST = 10 ▼

AUX

The vehicle has a specialized add-on to its communication system that greatly boosts its range. This allows it to patch into man-made satellites when the vehicle is on a planet, or transmit messages over great distances in space. The direct Communication range of a vehicle equipped with a Satellite Uplink is multiplied by one thousand (flight or space range factors still apply). The Satellite Uplink includes tracking and motion-correction equipment so the system can be used at up to half-Combat speed (or half-Thrust).

● **SEARCHLIGHT** COST = 0.25 PER 50 M RANGE (FIXED), 0.75 PER 50 M RANGE (SWIVEL) ▼

AUX

The vehicle has a powerful front-mounted lighting system. At night, treat the vehicle's Fixed Forward firing arc as if it were in daylight. Some searchlights are mounted on a swivel plate: at night, the vehicle's Front (or Right, Left, or Rear, as selected) firing arc is treated as if it were in daylight. Any fire directed at the vehicle is also treated as if the vehicle were in daylight, regardless of the arc.

● **SICK BAY** COST = 2 X MAXIMUM NUMBER OF PATIENTS ▼

Some large vehicles have an infirmary or sick bay. These facilities have no value in the tactical game, but, in the roleplaying game are considered to be constant medical aid for healing purposes. Sick bays are rated by their maximum number of patients.

● **STEALTH** COST = RATING X 3 ▼

AUX

R

Stealth systems are features that make a vehicle difficult to detect with sensors: heat baffles, radar-absorbing skin, silent systems, etc. In tactical game terms, Stealth adds its rating to the vehicle's Concealment value when opponents use Sensors to detect it (see page 151 of the rulebook). Stealth systems have no effect upon visual detection.

● **STRATOSPHERIC FLIGHT** COST = 8 ▼

An aircraft with this Perk can climb past the habitual ceiling of 12 km (altitude level 48 in Air War scale), in effect going into the stratosphere, up to an altitude of 50 km (altitude level 200 in Air War scale). It requires the Space movement mode and sufficient reaction mass in order for the vehicle to move into orbit, however. Flying vehicles in the stratosphere double their Flight MP at no cost because of the rarefied atmosphere. Only Flying vehicles can take this Perk.

● **STREAMLINING** COST = 2 ▼

The vehicle is shaped to present minimal resistance to the medium through which it moves. It gets +1 MP when moving at Top Speed. Streamlining has no effect on space movement, but reduces the amount of thrust required to fly within an atmosphere (see page 148 of the rulebook). Aircraft are already considered to be streamlined, but taking this option makes them even more so.

● **TARGET DESIGNATOR** COST = 5 + BASE RANGE IN HEXES ▼

AUX

Target designators are used to lock-on guided weapons (see *Guided Weapons*, page 127). To lock-on a designator, the vehicle simply "attacks" the target, using the designator as the weapon. Its Base Range is equal to its rating. It has +0 accuracy and does no damage. Any successful attack "paints" the target for incoming guided munitions. The target remains designated until the end of the round.

● **TOOL ARM** COST = 0.3 X RATING FOR EACH ARM ▼

R

The vehicle has an arm-like structure with a specialized tool attachment, such as an earthmoving scoop or a cargo handling claw. Tool arms are very diverse and can represent forklift-like cargo loaders, a tow truck's winch arm, a crane's boom, an extendible blowtorch, a sensor boom or any other useful tool that can be imagined. The only restrictions are that the arm cannot handle objects with the finesse of a manipulator and its function must be clearly defined.

Tool Arms can lift objects whose Size is equal to or lower than their rating, provided it has been attached to or is contained by the arm. No matter what the rating of a Tool Arm, a vehicle cannot lift an item whose Size is greater than twice its own Size. Half the capacity of weaker arms are added to the full capacity of the strongest arm to determine the lifting strength of multiple arms. Optionally, Tool Arms can be reinforced to punch or crush opponents. These attacks have a Damage Multiplier equal to the lifting capacity of the arm. This option adds nothing to the Perk's cost but modifies the Offensive Score (see page 104).



► FLAWS

Flaws are the opposite of Perks. Flaws represent defects or shortcomings in the vehicle. Sometimes these shortcomings are planned into the vehicle as a cost cutting measure, at other times the defects are the result of design errors (either ignored by the designer or caused by a Lemon roll). Flaws, just like Perks, are rated by a "cost." Flaws are subtracted from the Perks' cost — they reduce the total cost of the vehicle.

Some Flaws have an "R" icon beside their listing. These have a Rating associated to them.

● ANNOYANCE

COST = -0.2 PER ANNOYANCE ▼

Annoyances are the tiny little things that make vehicle crew (and technicians) scream in frustration. Any design can have something infuriatingly annoying about it. Small vehicles are typically cramped and uncomfortable. Vehicles packed with electronics often have some minor subsystem on the blink now and then. Vehicles with powerful engines can have noise problems.

This type of Flaw is too insignificant to have an effect on the tactical game, but Annoyances are interesting for roleplaying purposes. They also serve to individualize the various vehicle designs, and they add significant "character" to the vehicle. Each Annoyance must be clearly identified and described, and this Flaw cannot be taken more than five times per vehicle. The gravity of the Annoyance is left entirely to the designer of the vehicle — it might even be used against the vehicle, if it significantly impair its performances.

■ SAMPLE ANNOYANCES

Name	Game Effect
Bad Left Turning Ability	The vehicle doesn't respond well on left side maneuvers
Cramped Crew Compartment	Limit on crew's BLD
False Alarm System	Gives false warning to crew
Instruments are hard to read	Crew has to concentrate harder
Loud Engine Noises	Engine makes worrisome noises
Minimum Skill	A minimum Skill level is required to operate the vehicle
Small entry hatches	Takes one more turn to enter/exit
Stale Smell	Ventilation system creates strange odors
Uncomfortable Seats	Reduce crew Skills after a certain number of hours

● BRITTLE ARMOR

COST = -10 ▼

The vehicle's armor and superstructure are either of poor quality or just badly attached/fitted. When the vehicle is hit, large sections fall off or the molecular structure of the armor material is severely weakened. The vehicle loses twice the usual Armor points loss from damage, that is, two points at Light Damage and four at Heavy.

● CANNOT GLIDE

COST = -4 ▼

The aircraft has little or no wing span, and cannot gain lift without constant thrust. Should the engines fail, or be cut off for any reason, the aircraft will automatically enter an uncontrollable fall (see page 148 of the rulebook) which cannot be escaped unless the engines are brought back on line. Only vehicles with the Flying movement can take this Perk.

● DECREASED MANEUVER

COST = -(RATING X 2) ▼

When using one type of movement, the vehicle loses some of its natural agility. This Flaw only applies to vehicles with two or more Movement Types and must be linked with one Movement Type in particular. When this Movement Type is used, the rating of this Flaw is applied to the vehicle's Maneuver value.

● DEFECTIVE SENSORS

COST = -RATING ▼

The vehicle's sensor system has a tendency to go on the blink in a random manner. Defective Sensors are rated from 1 to 5. In combat, one die is rolled before attempting to use Active Sensors. If the roll is equal to or less than the Defective Sensors rating, the Flaw's rating is applied as a negative modifier to the Sensor test.

● DEFECTIVE FIRE CONTROL

COST = -RATING X 2 ▼

The vehicle's Fire Control system has a tendency to go on the blink in a random manner. Defective Fire Control is rated from 1 to 5. In combat, one die is rolled before firing a weapon. If the roll is equal to or less than the Defective Fire Control rating, the Flaw's rating is applied as a negative modifier to the attack.

● DIFFICULT TO MODIFY

COST = -1 PER SUBASSEMBLY, -5 FOR THE ENTIRE VEHICLE ▼

The vehicle's innards are a nightmare of intertwined machinery and cables. Pieces must be specially machined for it, bolts and nuts are not standard, the color coding is wrong, etc. Very few vehicles with this Flaw will make it out of the factory, and even less of these will find their way to the front lines. If it happens anyway, both pilots and technical crew will spend most of their time nursing it.

As a result of the design, one (or more) of the vehicle's subassemblies is hard to repair or replace. A -1 modifier is applied to all repairs and modifications attempts on this particular subassembly of the vehicle. The subassemblies covered by this Perk are: Movement, Structure, Fire Control and Auxiliary Systems.

● EXPOSED AUXILIARY SYSTEMS

COST = -5 ▼

If the vehicle has all sorts of external gizmos attached to its hull with little or no protection, then it is likely to have the Exposed Auxiliary Systems Flaw. This Flaw is particularly appropriate for vehicles with large sensors, satellite uplinks, or external ECM pods. Whenever an Auxiliary Systems effect is rolled on the Systems Damage Table, it is treated as if the damage was one stage worse (i.e. Light Damage is treated as Heavy and Heavy Damage as all Auxiliary Systems destroyed).

● EXPOSED CREW COMPARTMENT

COST = -5 ▼

This Flaw is used to represent the open tops of jeeps and convertible vehicles. If only part of the crew or passengers are exposed, use the "Partially Exposed Crew" Flaw instead (see page 122). Vehicles with Exposed Crew Compartments should not be front-line combat units under any circumstances. Whenever a Crew effect is rolled on the Systems Damage Table, it is treated as if the damage was one stage worse (i.e. Light Damage is treated as Heavy and Heavy Damage as all crew killed).

● EXPOSED FIRE CONTROL SYSTEMS

COST = -4 ▼

The vehicle's Fire Control mechanisms are inadequately protected. Firing sensors are exposed, barrel elevation mechanisms are unarmored, and so on. The weapon systems themselves may be temperamental, refusing to function correctly at the slightest damage. A +1 modifier is added to the die when rolling on the Fire Control Damage Table.

● EXPOSED MOVEMENT SYSTEMS

COST = -5 ▼

Combat vehicles normally have well-protected movement systems. It is possible, though, that a vehicle does not. It might be because its motive systems are too large, protrude too far away from the chassis, or are completely unarmored. If the vehicle is a civilian or non-combat model, odds are that its movement system is poorly protected. Whenever a Movement systems effect is rolled on the Systems Damage Table, it is treated as if the damage was one stage worse (i.e. Light Damage is treated as Heavy and Heavy Damage as all movement systems destroyed).

● EXTERNAL POWER

COST = -2 ▼

AUX

The vehicle does not have a powerplant and does not require regular fill-ups with fuel or reaction mass. It draws its energy from wired or beamed power. The vehicle still has to undergo basic maintenance from time to time, though. This is what the Deployment Range rating represents in this case. External Power is not strictly a Flaw, but is a liability even though it reduces the vehicle's weight and cost.

External power can be beamed in, with a collector device receiving the energy and converting it for use by the vehicle's systems. The vehicle must remain in line-of-sight with the power supplier. If the collector is destroyed, the vehicle will suffer total power failure. The energy may be wire-fed instead, with the vehicle trailing a wire for power. A Piloting roll must be made every turn against the highest MP cost for the hexes traveled to avoid snagging the cable. Flying drones must test also and use the overflowed ground's MP cost. Space drones are not affected. Failure means the cable is stuck and the drone must halt for the next round to free it. A fumble means the cable is severed. The cable has a Damage Point Capacity equal to the vehicle's Size, per hex.

● EXTREME OVERHEATING

COST = -10 ▼

The vehicle is prone to overheating in a highly dangerous manner. The vehicle will automatically suffer a Light Damage effect if it does any of the following for two combat rounds in a row: move and fire a weapon, fire three or more weapons, or use Space movement. If it does any of those actions for three combat rounds in a row, the vehicle will suffer a Heavy Damage effect.

● FRAGILE CHASSIS

COST = -5 ▼

Since the construction system assumes military designs per default, its vehicles have very tough superstructures. Civilian vehicles and some non-combat vehicles normally use lighter, less expensive chassis to help cut costs. These chassis perform just fine under everyday, normal usage, but they are more vulnerable to weapons fire and physical damage. +1 is added to the die when rolling on the Structural Damage Table.

● FUEL INEFFICIENT

COST = RATING ▼

R

The vehicle gulps down massive amounts of fuel. Each kilometer traveled adds the rating of this Flaw for Deployment Range purposes. For example, a vehicle with this Flaw at Rating 2 will count each kilometer traveled at Top Speed as six for fuel purposes (1+2, times two for Top Speed consumption).

● HAZARDOUS AMMO/FUEL STORAGE

COST = -5 ▼

The vehicle's fuel tanks and/or ammunition bays are poorly designed. They are either placed in a prominent place, lightly armored, or even both. +1 is added when rolling Light Damage on the Fire Control Damage Table, +2 when rolling Heavy Damage.

● HEAT VULNERABLE

COST = RATING ▼

R

The armor of the vehicle cannot withstand high energy attacks such as those from lasers or shaped-charge warheads. Subtract the rating of this Flaw from the Armor rating of the vehicle when submitted to a HEAT attack.

● HIGHLY FLAMMABLE

COST = -2 ▼

The vehicle is built with flammable materials, or is extremely sensitive to excessive heat. All incendiary attacks have their Intensity doubled. If the vehicle is destroyed, it will keep burning at Intensity 10 for an additional number of turns equal to its Size.

● INEFFICIENT COMBAT COMPUTER

COST = -4 ▼

The vehicle's fire control computer is easily overtaxed and can only fire one weapon or set of linked weapons per turn without penalty. If more than one weapon or link is fired, a -1 modifier is applied for each weapon or link fired after the first, to all attack rolls beyond the normal modifier for extra actions spent. This Flaw can only be taken by vehicles with two or more weapons.

● INEFFICIENT CONTROLS

COST = -9 ▼

The vehicle's control mechanisms are poorly organized, causing the crew to waste precious time in high-stress situations. The number of crew actions is reduced by one.

R

● LARGE SENSOR PROFILE

COST = -RATING X 2 ▼

A design Flaw has made the vehicle more visible to sensors: a large structure, a high infrared signature, a poorly shielded, overly powerful electronic suite, or a significant radar trace. The Flaw's rating is subtracted from the vehicle's Concealment value versus sensors (not for Obscurement). While this has a limited effect in tactical combat, a large sensor profile is hazardous when trying to ambush enemies or evade pursuit.

R

● MAXIMUM CEILING

COST = RATING X -1.5 ▼

Aircraft with this very common Flaw cannot climb past a certain altitude. The rating is subtracted, in kilometers, from a height of 12 km to give the aircraft's maximum ceiling. For example, an aircraft with a Maximum Ceiling rating of 4 cannot climb past (12 - 4 =) 8 kilometers (an altitude level of 32 in Air War scale). Rotary wing craft rarely have ceilings higher than 4 km (rating 8). Aircraft that can go higher than 12 km cannot take the Maximum Ceiling Flaw. Only Flying vehicles can take this Perk.

R

● MAXIMUM CLIMBING ANGLE

COST = RATING X -3 ▼

Some aircraft lacks the lift or the engine power to rapidly ascend into the air. Aircraft with this Flaw must advance a certain number of hexes before they can climb one altitude level; the rating of the Perk gives the number of hexes. If equipped with a VTOL system, the aircraft must either move forward as above or spend an additional MP per altitude level risen. Only Flying vehicles can take this Perk.

● MUSCLE-POWERED

COST = -5 ▼

The vehicle relies on muscular energy to move. Vehicles with this Perk can be animal-drawn carriages, bicycles, or even lightweight submarines or flyers. Even ion drive "space bicycles" are possible. Muscle-powered vehicles may not take the "No Engine" Flaw, even though they have no real engine, only a transmission system. They require a minimum of (vehicle's Size, squared) human crew for power. Crewmembers can be replaced by animals, though BLD must be equivalent (a single 140 kg animal equals two 70 kg men, for example).

Movement Speeds and Deployment Range are not chosen for the machine and count as zero for calculation purposes. Instead, the maximum speed in hexes (adjusted for air and space) is equal to the average Strength, plus three. The Deployment Range of such a craft is equal to the average Stamina, times two. One point is added to the average Strength and Stamina for each doubling of the team's size. Speed cannot be greater than the maximum speed of the slowest member of the team if the vehicle is directly pulled or pushed. The stats are recalculated if the vehicle takes casualties (pre-calculated performances for each casualty are recommended to save time during play).

● NO COMMUNICATION

COST = -5 ▼

The vehicle is not equipped with any form of communication system. It cannot stay in contact with teammates and cannot act as forward observer for indirect fire. It may not benefit from Command Points under any circumstances. Such a vehicle has both Communication rating and range equal to zero for calculation purposes.

● NO ENGINE

COST = -2 ▼

This is not a Flaw *per se*: the vehicle has simply been designed without an engine or power transmission system and must be towed or catapulted. Vehicles with this Flaw usually have compensating Perks like Glider. If flying, the vehicle cannot have a Stall Speed lower than 1, unless it also has the Lighter-than-Air Perk. Movement hits are ignored, though Armor is lost as usual.

● NO SENSORS

COST = -6 ▼

The vehicle has no electronic sensors and may only detect opponents visually. The vehicle is likely to have a clear canopy or exposed crew compartment. Such a vehicle has both Sensor Rating and range equal to zero. It cannot perform an Active Sensor check and must rely entirely on the Detection rating of its crew to acquire its targets (see page 150 of the rulebook).

● ONE WAY COMMUNICATION

COST = -2 ▼

The vehicle's communication system can either receive or emit, but not both. This Flaw is useful to save cost on expendable automated drone units or second-line vehicles. Only receiving Communication systems allow the unit to use Command Points, and only emitting systems allow forward observing.

● OVERHEATING

COST = -5 ▼

The cooling systems have been badly designed or damaged and the vehicle is prone to overheating in a dangerous manner. The vehicle will automatically suffer a Light Damage effect if it does any of the following for three combat rounds in a row: move and fire a weapon, fire three or more weapons, or use Space movement.

● PARTIALLY EXPOSED CREW

COST = -5 X (CREW EXPOSED / TOTAL CREW), ROUNDED OFF ▼

Only part of the crew is protected by the vehicle's mass and armor; the rest is exposed to enemy fire. The vehicle is considered to have the "Exposed Crew Compartment" Flaw until all exposed crewmembers have been eliminated. For example, a vehicle which has three crewmen in an enclosed cockpit and four gunners on open mounts will have the Flaw until the four gunners are casualties. The cost would be (4 + 7 =) 0.571 x -5, rounded off to -3.

● PROBLEM-PRONE

COST = -1 PER ADDITIONAL LEMON DIE ▼

Tighten one bolt, and two come loose. For some unknown reason, problems seem to crop up everywhere on the new design. One die is added to the Lemon roll, regardless of the chosen production type.

● POOR OFF-ROAD ABILITY

COST = -1 ▼

All ground vehicles are given a certain amount of innate off-road ability by the basic rules. Most civilian vehicles and some military transports, however, lack the rugged suspensions and transmissions required for proper all terrain performance, and thus have this Flaw.

Whenever entering terrain that costs two or more MP (not including elevation changes), the MP cost of the hex is increased by one. The vehicle may ignore this penalty and move counting the normal MP cost, but the crew must make a Piloting Skill roll for each hex against a Threshold equal to 4 + the hex's MP cost. If failed, the vehicle suffers Light Movement damage or is stuck for 1d6 rounds. If fumbled, the vehicle suffers Heavy Movement damage or is stuck permanently and must be towed out. Use the usual damage method to decide which option occurs. Roll a die: even number, Attacker chooses, odd number, Defender chooses.

● POOR TOWING CAPACITY

COST = -1 ▼

The vehicle's powerplant is too small for towing, or its transmission system is not up to the task and overheats all the time. The vehicle's towing capacity is halved. Few if any military vehicles will have this Flaw.

● RANDOM SHUTDOWN

COST = -0.5 X RATING ▼

R

Whenever the vehicle is strained (each turn of combat or every 15 minutes of moving at Top Speed), the vehicle's Pilot must roll two dice to avoid shutting down for a number of combat turns equal to the roll of one die. The Threshold is equal to one, plus the rating of this Flaw. The vehicle may not overtake or take any action while shut-down.

● REQUIRES AIRSTRIP

COST = -5 ▼

The aircraft cannot land on rough or even smooth non-asphalted ground. An airstrip or straight portion of highway (in very good condition) is required for a safe landing — this is represented by a Road (see page 88). In any other case, the pilot must make a Piloting skill roll against a Threshold equal to 3 plus the Ground MP cost of the hex to avoid crashing. Only Flying vehicles can take this Perk.

● SENSOR DEPENDENT

COST = -6 ▼

The vehicle's cockpit does not allow the pilot a direct, clear visual image of his vehicle's surroundings. In tactical game terms, the vehicle must use its sensors to detect anything. If the sensors are damaged or destroyed, the vehicle is running blind and is next to useless. It cannot attack, nor can it move. Any such attempt is automatically randomized on the board (i.e., direction and target are determined by the dice instead of the controlling player). If the environment permits, one or more crewmembers may open a hatch, negating the sensor penalty but acquiring the Partially Exposed Crew flaw.

● TRACEABLE EMISSIONS

COST = -RATING X 3 ▼

R

The vehicle emits large amount of residual heat, smoke, radiation, etc., and is thus easily tracked down. This is not the same as Large Sensor Profile, which relates to the vehicle itself; if the vehicle is shut down, these emissions disappear. Sensor rolls to spot the vehicle have a bonus equal to the Rating of this Flaw. Guided weapons automatically lock-on without need for a designator. AIs and computers (such as autopilots) may be instructed to track these emissions.

● UNSTABLE

COST = -2, -5 FOR AIRCRAFT ▼

The vehicle is somewhat hard to control at high speed, either because it is badly designed or just too heavy. Apply a -1 modifier to all Piloting skill rolls at Top Speed or in terrain with a MP cost greater than one. This is a more serious Flaw in an atmospheric flight vehicle, where a sudden turn can result in a loss of lift, intake, or any of a dozen other serious problems. A flight vehicle suffers a -1 to Maneuver any time it travels at a speed higher than Combat Speed.

● VULNERABLE TO HAYWIRE EFFECTS

COST = -5 ▼

The vehicle is highly vulnerable to electrical attacks; fragile circuitry and ungrounded systems are prone to excessive damage. Weapons with the "Haywire" characteristic get three damage rolls instead of their normal two. In the roleplaying game, the Intensity of any electrical attack directed against the vehicle is doubled.

● WEAK FACING

COST = -0.25 X BASE ARMOR RATING PER DEFENSIVE ARC ▼

The vehicle has a weak facing; this may be due to incomplete armor coverage, shoddy design, or plain bad material. When the vehicle is attacked in the corresponding defense arc, its effective Armor total is halved before checking for damage. This Flaw cannot be taken more than twice per vehicle (i.e., two facings maximum).

● WEAK POINT

COST = 0.5 X RATING, ROUNDED DOWN ▼

R

The vehicle has a weak point in the armor covering one of its locations. This may be due to incomplete armor coverage, shoddy design, or flimsy armor material. When a specific system/location is aimed at (not just randomly rolled on the System Damage Table) and successfully hit, the base Armor is reduced by the Rating of this Flaw before checking for damage. This Flaw cannot be taken more than twice per vehicle.

● WEAK UNDERBELLY

COST = -0.2 X BASE ARMOR RATING ▼

The underside of the vehicle is either unarmored or otherwise poorly protected. The vehicle's effective Armor is halved against all attacks coming in directly from below, such as minefields.

► OFFENSIVE AND DEFENSIVE SYSTEM DESIGN

This section is titled *System Design* because it can be used to design not only weapons, but also some more specialized equipment such as grapples and shields. Like the vehicle design system, the following rules let the designer choose the basic performance required by the system's specific function, then modify them with special characteristics to represent virtually anything that can be imagined.

The various rules listed here should only be used to build Vehicle-scale weapons and systems. Although they can probably work pretty well for large Personal-scale systems, they have not been calibrated for that and the resulting calculations can lead to some pretty strange results. Other than this, there is no practical limit to what can be done: it is all a matter of putting the right characteristics together.

To avoid the cumbersome notation "weapon/system/etc.," every system is referred to as a weapon, because this is what most systems designed here will be.

▼ STEP ONE: BASIC ATTRIBUTES

Starting from a concept, the basic Attributes of the new system are selected. These can and will be modified by special characteristics bought later in the design process. Each system has four basic Attributes: Damage Multiplier, Base Range, Accuracy and Rate of Fire. Although primarily intended for weaponry, the Attributes can be modified to represent other types of systems and devices, such as shields and decoy launchers.

◇ SELECT DAMAGE MULTIPLIER

The weapon's Damage Multiplier (DM) is first selected. This is the basic damage caused by the weapon against the target. The effectiveness of Damage Multipliers increases exponentially, not linearly: a DM of 10 is not twice as effective as a DM of 5, it is four times as effective. The Damage Multiplier, squared, is roughly equal to the average thickness of armor-grade steel penetrated by the weapon, in millimeters, given optimum conditions.

The Damage Multiplier also serves as a measure of the basic effectiveness of a system such as a shield or a flare launcher. In these cases, a higher Damage Multiplier usually means a larger, tougher or more efficient system. This is fully explained in the relevant characteristics later on.

◇ SELECT BASE RANGE

The weapon's Base Range is chosen next. This is the limit of the weapon's Short Range. The weapon's Medium, Long and Extreme Ranges are equal to 2, 4, and 8 times the Base Range, respectively. It is possible to have a weapon with an Extreme Range shorter than 8: its Base Range will then be equal to 0 for calculation purposes, but the exact range values are established by the designer (for example, 0/1/2/3). Ranges are expressed in hexes — the real combat range is equal to 50 meters per tactical hex.

The Extreme Range of the weapon, when expressed in meters, is not the true limit of the weapon's potential. A weapon can fire out five times as far (and does, when used in air combat — see rulebook, page 146). If used in space, where there is no atmosphere or gravity, the actual range is ten times greater (500-meter hexes instead of 50-meter ones — see page 130 of the **Jovian Chronicles** rulebook); only the difficulty of hitting at these long distances prevents true line-of-sight range. Range values (for example, 1/2/4/8) remain the same in all combat scales: only the actual physical size of the hex changes.

Weapons with no Base Range are considered to be *Melee weapons* and are only useful in close combat (Point Blank only — 25 meters or less). Melee weapons have their own Threat Rating formula to take this into account.

◇ SELECT ACCURACY

The weapon's Accuracy is the third basic Attribute. A weapon with standard Accuracy has a score of 0. High quality systems have positive values while inaccurate systems have negative ones. Accuracy cannot go lower than -5 or higher than +5; the normal range is -2 to +2. Accuracy represents not only the weapon's quality, but also how wide the beam/spray/blade is, how easy it is to move the weapon around, and a host of other factors that determine whether or not the weapon or system will be successful in its assigned task.

◇ SELECT RATE OF FIRE

The Rate-of-Fire rating indicates weapons that are capable of sustained, wide area automatic fire. In the case of Missile weapons, the ROF value determines how many missiles can be launched per firing action.

Ammo consumption increases dramatically in automatic weapons, but makes special attacks possible (see *Burst Fire*, page 156 of the rulebook). Weapons which fire only a short, tight burst (say, three bullets per shot) would not require a ROF bonus; the three rounds would be considered as one "shot" of ammunition, i.e., one firing of the weapon.

STEP TWO: CHARACTERISTICS ▼

Characteristics are what make a gun different from a missile launcher or a laser. They serve to make each weapon or system unique, much like Perks and Flaws do for vehicles. All characteristics are grouped into three categories for ease of reference: General, Weapon and Ammunition. A General characteristic applies to the weapon and its ammunition — if this option is selected, it will affect the cost of both. General characteristics are chosen primarily for the weapon itself.

Conversely, a Weapon or Ammunition characteristic need only be applied to the cost of what it affects — the weapon or the ammunition. The system always retains Weapon characteristics, no matter the kind of ammunition loaded. It is possible to buy several different types of ammunition for the weapon by simply determining the ammo's basic cost and applying the Ammunition cost multipliers for the type desired. All rounding, when applicable, should be to the nearest whole number.

Some of the ammunition types cause no damage. This is obviously negated if another characteristic is taken that cancels this effect. Weapons cannot use ammunition that duplicates their existing function(s). Likewise, effects are not cumulative — applying the same cost multiplier several times does not improve the ammunition more than once.

● ADHESIVE

AMMO COST MULTIPLIER: X 5 ▼

Adhesive ammunition is designed to stick to the target before detonating. It places a -1 modifier on the attack roll, but, if successful, the warhead becomes attached to the target. If desired, it can be detached at any time by the attacker at the cost of one action. To detach an adhesive warhead, the defender makes a Piloting Skill roll versus the attack's Margin of Success plus the DM of the weapon. If the defending vehicle has manipulator arms, a bonus equal to half the Rating of the largest arm (rounded up) is applied to the Piloting roll.



● AIRBORNE TORPEDO

AMMO COST MULTIPLIER: X 1 ▼

The Airborne Torpedo is a form of projectile that is used to attack underwater targets. It skims the surface of the water until the last possible moment when it suddenly dives into the water, striking the submerged target in the same manner as a torpedo. Airborne torpedoes allow weapons above water to attack underwater targets without penalty. They cannot otherwise be used for submarine or land fighting.



● ANTI-INFANTRY

WEAPON COST MULTIPLIER: X (1 + 0.1 X DM); AMMO COST MULTIPLIER: X 10 ▼

The weapon or warhead is specifically designed to attack infantry units and other man-sized targets. Anti-Infantry weapons can be swung around very fast and their tracking system can register fainter readings than normal. These weapons do not suffer the normal -2 modifier when attacking infantry.



● AEROSOL

AMMO COST MULTIPLIER: X 1 ▼

The warhead vaporizes a thin mist of mirrored metallic particles which diffuses any energy beam attempting to penetrate it. Any energy weapon firing in, through or out of an affected hex has its Damage Multiplier reduced by 1 for each hex crossed, including the target hex but not the attacker's hex. Likewise, target designators suffer a -1 penalty to their lock-on roll per hex crossed by the beam. The mist has an Obscurement value of 1 and dissipates at the end of the next turn. Aerosol shells have no penetration power and thus no effect against armor.



● ANTI-MISSILE

WEAPON COST MULTIPLIER: X (1 + 0.5 X DAMAGE MULTIPLIER) ▼

The weapon is specially designed to attack or counter incoming missiles, either by misleading them away from the vehicle or destroying them outright. This characteristic is used to design anti-missile systems, ECM/scrambler pods and chaff/flare/decoy launchers. The weapon does not suffer the usual -6 modifier when used for Anti-Missile fire (see page 157 of the rulebook). The AM characteristic has a two-hex minimum range against missiles, though the weapon can be fired without penalty at vehicles.



● ANTI-STRUCTURE

AMMO COST MULTIPLIER: X 1 ▼

The warhead has been specially designed to damage or destroy buildings and other man-made structures such as roads and bridges. Whenever this type of ammunition is used against something with Structural Damage Points instead of Armor, the damage inflicted is doubled. If used as direct-fire, normal munitions, Anti-Structure ammo places a -1 modifier on the attack roll.



● AREA EFFECT

WEAPON COST MULTIPLIER: X (AREA EFFECT MULTIPLIER); AMMO COST MULTIPLIER: X 15 ▼

The weapon affects a large area around the target point. This can be due to an explosive effect or a large number of scattered submunitions. Area Effect weapons always have a minimum MoS of 1 versus everything in their radius, indiscriminate of friend or foe, even if the target(s) successfully defended. These weapons are rated in Area Effect (AE), followed by the radius of hexes of their blast area (radius 0 means only the target hex is affected). Area Effects greater than 4 are expensive: the multiplier is equal to the radius in hexes plus one, squared.



Area Effect ammo delivers a high concussion blast and/or scatters lots of shrapnel around when it detonates. It gives the weapon an AE of 0, unless it already has an Area Effect, in which case it adds one to the AE radius. Mass-destruction weapons, such as nuclear warheads, have special increased Area Effect values to accurately model their destructive capabilities. See Mass Destruction ammunition, page 129.

AREA EFFECT MULTIPLIER □

AE Radius	Area Effect Multiplier	AE Radius	Area Effect Multiplier
0 (5 m)	1.1	1 (75 m)	4
0 (10 m)	1.2	2 (125 m)	9
0 (15 m)	1.5	3 (175 m)	16
0 (25 m)	2	4 (225 m)	25

● **ARMOR-PIERCING**

GENERAL COST MULTIPLIER: X 5 ▼

The weapon is highly efficient when penetrating armor, concentrating all its energy on a single point to enhance its force. The vehicle's base Armor rating is halved to determine damage. If the attack is successful, the target does not lose any Armor points (the entry hole is too small to affect the Armor rating), but takes system damage as usual. Targets may not be Overkilled by Armor-Piercing weapons. Any extra damage past the Overkill Armor Threshold of the target are kept by the projectile, possibly affecting something beyond. For most games, however, it is better to ignore further effects for simplicity.

● **ARMOR-CRUSHING**

GENERAL COST MULTIPLIER: X 2 ▼

The weapon is highly efficient when destroying armor plating and structures, either because of sheer striking power or because of its nature (mechanical saws, for example). If the attack is successful, the target loses twice the usual Armor points (2 for Light Damage and 4 for Heavy Damage) in addition to the usual system damage. If the damage point total of the attack is equal or greater than half the target's Armor (but still under the Armor), the target loses one Armor point with no additional effect.

● **ATTENUATING DAMAGE**

GENERAL COST MULTIPLIER: SPECIAL ▼

The weapon loses a significant portion of its damage potential over distance. This is often the case with energy weapons which lose both focus and energy according to range. An AD number is subtracted from the Damage Multiplier for each range band beyond Short. For example, a x12 weapon with AD2 would be x10 at Medium, x8 at Long and x6 at Extreme range.

This characteristic does not have an associated cost multiplier. Rather, the AD number is subtracted from the Damage Multiplier for calculation purposes (the above x12 weapon with AD2 would count as a x10 weapon when calculating its cost).

● **BIOLOGICAL**

AMMO COST MULTIPLIERS: X 12 (SEMI-LETHAL), X 15 (LETHAL) ▼

The warhead contains a short-lived biological warfare agent, such as an airborne virus with a very short incubation period. Whether or not the agent is lethal should be decided during design. Lethal agent victims will die immediately after the battle, while semi-lethal agent victims can survive if provided with medical attention. The disease's infection sphere is assumed to cover the target hex, unless the weapon or ammunition also has an Area Effect — in that case, add one to the AE. Biological shells have no penetration power and thus no effect against armor. Enclosed vehicles and infantry in sealed suits are not affected by Biological rounds.

Infantry and vehicles with the "Exposed Crew Compartment" flaw are affected if hit (although the vehicle itself suffers no damage). For each ten points of damage, a penalty of -1 will be applied to all actions attempted by the target. This represents the fact that the enemy unit is feeling quite sick. If the penalty goes to -5 or worse, the affected unit becomes a casualty.

● **BOOSTED ACCURACY**

AMMO COST MULTIPLIER: X 20 ▼

"Boosted Accuracy" rounds represent any high accuracy shell or warhead, such as a self-correcting missile or hyper-velocity projectile with a flatter trajectory and a short lead time. If desired, this ammunition type may also represent tracers, though these are normally included in the basic ammunition load of the weapon. These give a +1 Accuracy to the weapon when used.

● **BOOSTED DAMAGE**

AMMO COST MULTIPLIER: X 15 ▼

Some weapon can fire enhanced ammunition such as self-forging warheads or customized armor-piercing shells. Many such munitions are small, terminally self-guided missiles that look for weak points in the armor just before striking the target. Boosted Damage ammunition adds 2 to the Damage Multiplier of the weapon.

● **BOOSTED RANGE**

AMMO COST MULTIPLIER: X 20 ▼

The weapon can fire enhanced ammunition such as continuous acceleration rounds or multi-stage propulsion units. Many such munitions are small, often semi-guided, tube-launched missiles. Regardless of the actual technology, the projectile can continue to accelerate once launched and thus cover a much greater distance. Boosted Range ammunition increases the weapon's Base Range by 50% (round down when counting hexes).

● **CHEMICAL**

AMMO COST MULTIPLIER: X 30 ▼

The weapon's shells are hollow and filled with a chemical agent. The most common payload is a deadly nerve gas. The gas cloud's radius is assumed to cover the target hex, unless the weapon or ammunition also has an Area Effect — in that case, add one to the AE. Chemical shells have no penetration power and thus no effect against armor. Enclosed vehicles and infantry in sealed suits are not affected by chem rounds. Other infantry are casualties (any remaining damage points are crossed out). Vehicles with the "Exposed Crew Compartment" flaw are also considered casualties if they are hit, although the vehicle itself suffers no damage.

● **CLUMSY**

WEAPON COST MULTIPLIER: X 0.5 ▼

The weapon is extremely large or unwieldy. This causes maneuver problems for the vehicle as it cannot compensate for the increased moment arm and/or unbalanced weight. The weapon causes a -1 penalty to the Maneuver rating of the vehicle while carried. This penalty disappears once the weapon is dropped (if this is possible) or fired (in the case of a single-use, disposable weapon).

● **CONCEALED**

WEAPON COST MULTIPLIERS: X 2 (ONE ACTION TO DEPLOY/RETRACT), X 3 (NO ACTION TO DEPLOY/RETRACT) ▼

The weapon is normally hidden within a concealed bay in the hull of the vehicle, protected by movable (and often barely noticeable) panels. When the crew wishes to use it, the weapon extends out of its housing and is used normally. Concealed weapons are built into the vehicle for two main reasons: protection and surprise.

The weapon cannot be detected while in its retracted position, and can ignore one damage result if retracted. Such a weapon may use ammunition clips, but they can only be changed when the weapon is deployed. Unfolding or retracting a Concealed weapon requires one action for each operation, unless it has been designed to "pop-up," in which case no action are required.

DEFENSIVE

GENERAL COST MULTIPLIER: X 0.5 ▼

The system has been built with a defensive purpose in mind and makes a poor offensive tool. This is the case with items such as shields, chaff and flare launchers or anti-missile laser sensor scramblers. The DM is halved and -2 to hit is applied when using the system to attack. Defensive measures such as Parrying, Blocking and Anti-Missile fire do not count as attacks.



DISINTEGRATION

GENERAL COST MULTIPLIER: X 100 ▼

Disintegrators are highly futuristic weapons that destroy the structural integrity of an object at the atomic or subatomic level. The technology of the **Jovian Chronicles** universe does not allow this type of weapon to be built, but they may be possible in the far future as Mankind's understanding of sub-atomic physics improves.

In game terms, a disintegrator will completely destroy anything it achieves a Light Damage result against — the target is vaporised, leaving only a globe of burning gases behind. If the disintegrator fails to do Light Damage but still hits, every point of damage inflicted reduces the Armor Rating of the target by one point. Infantry squad members who receive damage from a disintegrator are considered to be casualties, even if they do not lose all their damage points. Targets other than vehicles and infantry, such as buildings and terrain features, take five times normal damage from disintegrators.



ENERGY-HOMING

GENERAL COST MULTIPLIER: X 3; AMMO COST MULTIPLIER: X 10 ▼

The weapon uses the target's electronic emissions to lock-on and destroy it. It is most often used for missiles, but special computer/sensor systems can be adapted for direct fire weapons. If the target made an Active Sensor roll, used communication or has any kind of ECM or ECCM active during the combat round where the Energy-homing attack takes place, the weapon gains a +2 to hit (only +1 for energy-homing ammunition, since it has less room for sensors).



ENTANGLE

GENERAL COST MULTIPLIER: X 2 (MELEE), X 2 + 1 PER HEX OF BR; X 0.5 (IF NOT DAMAGING); AMMO COST MULTIPLIER: X 10 ▼

Weapons with the Entangle characteristic can be used to immobilize an opponent. Entangling weapons can be designed as either melee or ranged weapons. Ranged weapons can be used in melee. A vehicle hit by an Entangle weapon either receives damage or is ensnared and unable to move or fight. The decision (attacker's choice) to damage or immobilize must be made before the attack, publicly. Some Entangling weapons are incapable of causing damage.

To escape an entangling attack, a Piloting Skill roll is made versus the attack's Margin of Success. This is modified by the difference between the Damage Multiplier of the weapon (half DM for Entangle ammunition) and the Size of the trapped vehicle. If the defending vehicle has arms, half the rating of the largest arm (rounded up) is applied to the Piloting roll.



FRAGMENTATION

AMMO COST MULTIPLIER: X 15 ▼

Fragmentation ammunition, often known as shotgun rounds, fires multiple small projectiles (flechettes or pellets) instead of a single large warhead or projectile. Though this reduces the damage caused by the individual hits, the sheer number of projectiles creates a "swarm" effect that makes it easier to hit or even hit multiple targets.

In game terms, the attacker adds +1 to his attack roll, halves the Damage Multiplier (round up), and adds +2 to the weapon's effective ROF. The weapon cannot walk its fire or saturate an area unless it has +1 or better ROF without the Fragmentation ammunition.



FIRE-FIGHTING

AMMO COST MULTIPLIER: X 1 ▼

The shells/warheads are filled with a stable compound which expand into a fire-fighting foam once exposed to atmosphere. The foam cancels one die's worth of Fire Intensity points per ten points (or part thereof) of "damage." Foam shells have no penetration power and thus no effect against armor. The foam is non-toxic, harmless to people and dissolves in water.



FLICKER

GENERAL COST MULTIPLIER: X 1 - (0.1 X RATING) ▼

Some systems require so much power to function that they are alternatively turned on and off to reduce the overall energy requirements. Others have fluctuating power spikes or energy fields and only function at certain points of their cycles. Select a rating between 1 and 6. Whenever a Flicker system is used, two dice are rolled normally. If the result is higher than the system's rating, the system is powered at that particular instant and may be used (otherwise, nothing happens and the action is wasted).



GRAVITIC

GENERAL COST MULTIPLIER: X 3 (SINGLE-FUNCTION), X 5 (DUAL-FUNCTION) ▼

Gravitic systems can manipulate gravity itself, which leads to many impressive tricks. Single-function systems can only emit or attract gravitons, and thus can either pull or push (but not both). Dual-function systems can switch between pull and push at any time. Unfortunately, although there is research on gravitons in 2210, no one has yet formally detected, much less manipulated, the elusive particles that are believed to transmit gravity.

Gravitic weapons do damage normally (in this case, by either ripping off or crushing part of the target). The Gravitic weapon can also be used to push or pull the target, or, if the attacker is lighter than the target, drag itself forward at the same rates as weapons with the Winch characteristic (page 132). A Gravitic weapon can be escaped by making a Piloting Skill check versus the MoS of the attack. This is modified by the difference between the DM of the weapon and the Size of the trapped vehicle.



GUIDED

GENERAL COST MULTIPLIER: X 3; AMMO COST MULTIPLIER: X 20 ▼

Guided weapons and ammunition have the ability to seek a target and correct their course in mid-attack, or they can use targeting information supplied by a friendly unit to improve their accuracy. Guided weapons gain a +2 modifier to their attack roll versus targets that have been "tagged" by an allied target designator (see the *Perks* section) within communication range. Guided attacks versus targets marked by a target designators do not need forward observers, they only need someone to successfully mark the target.





● HAYWIRE

GENERAL COST MULTIPLIER: X 2 AMMO COST MULTIPLIER: X 15 ▼

The weapon's attack form consists of or causes a massive electrical discharge that fries circuitry, damages sensitive systems and shocks crewmembers into unconsciousness or death. This discharge courses through its target, often causing multiple systems to fail simultaneously. In tactical terms, the weapon gets two rolls on the Systems Damage Table when it scores Light or Heavy Damage on an opponent. In roleplaying terms (for example, if "Crew" is rolled on the damage table), the weapon's second damage result is treated as an electrical attack with an Intensity equal to its Damage Multiplier plus the Margin of Success. Because of power storage limitations, Haywire ammunition uses only half the weapon's normal DM to calculate damage.



● HEAVY

WEAPON COST MULTIPLIER: X 0.75 ▼

The weapon is extremely heavy/cumbersome. It causes a -1 MP penalty to the Top Speed of all movement types (Combat Speeds are recalculated accordingly). This penalty disappears once the weapon is dropped (if this is possible) or fired (in the case of a single-use, disposable weapon). This characteristic is often paired with Clumsy.



● ILLUMINATION

GENERAL COST MULTIPLIER: X 1.5 AMMO COST MULTIPLIER: X 1 ▼

The weapon can release an intense burst of light which can be used to blind opponents in battle. A normal attack is rolled; if successful (i.e., at least Light damage or one point of damage, in the case of infantry), the target is blinded for a number of rounds equal to the Margin of Success, but may still use Active Sensors. If the weapon has an Area Effect or a Wide Angle, the illuminated area is counted as being in daylight.

Illumination ammunition is usually reserved for dedicated flare launchers, but can be manufactured for any gun or missile. The flare will illuminate an area equal to the weapon's Area Effect plus two (so a weapon with no AE would have an AE of 1, an AE of 0 would become 2, an AE of 1 would become 3, and so on). The flare will last one turn per ten points of the weapon's Damage Multiplier, rounded up. The illuminated area is counted as being in daylight.



● INCENDIARY

GENERAL COST MULTIPLIER: X 0.75 AMMO COST MULTIPLIER: X 10 ▼

Incendiary weapons are intended to ignite and burn their targets. Incendiary weapons do not do damage normally. Instead, they cause a fire whose Intensity score is equal to the weapon's Damage Multiplier plus the attack's Margin of Success. Incendiary is often used with the Persistent characteristic (page 130). Incendiary rules are described on page 85.

Incendiary ammunition is filled with an incendiary compound such as napalm or white phosphorus. It gives the weapon the Incendiary characteristic in addition to its normal damage.



● INDIRECT FIRE

WEAPON COST MULTIPLIER: X 1.5 ▼

The weapon can perform indirect fire, curving its attack to hit targets that are obscured by terrain. The attacker does not need to have a direct line of sight in order to attack or otherwise affect the target; only a forward observer to tell him where to aim. Indirect fire rules are described in the Mechanized Action section of the rulebook, page 156.



● INFINITE USE

GENERAL COST MULTIPLIERS: X 5 (RANGED WEAPONS), X 1 (MELEE WEAPONS) ▼

Some weapon types do not require ammunition. Others are configured to draw power directly from the vehicle's powerplant or some other inexhaustible energy source instead of relying on capacitors or ammo packs. These weapons never expend ammunition, but neither can they use any of the special ammunition types.



● LIMITED USE (LU)

GENERAL COST MULTIPLIERS: X LIMITED USE MULTIPLIER ▼

The weapon can only be used for a short period of time before requiring a complete overhaul. They need not purchase ammunition — they are entirely self contained. The note "LU" is placed in the ammunition column of the record sheet to indicate the number of rounds the weapon can be used. LU weapons may be switched off to conserve energy.

□ LIMITED USE MULTIPLIER

Duration	Multiplier	Duration	Multiplier
1 round	x 0.3	5 rounds	x 0.7
2 rounds	x 0.4	6 rounds	x 0.8
3 rounds	x 0.5	7 rounds	x 0.9
4 rounds	x 0.6		



● LIQUID

GENERAL COST MULTIPLIER: X 0.75 ▼

The weapon shoots some kind of liquid. Liquid launchers count as only half damage versus the target's Armor since the energy of the spray is not concentrated. Sprayed liquid splashes everywhere, hitting anything in its path. The spillover area is a 360° circle centered on the mid-point of the target. For each ten points of damage caused to the target (before halving), the radius of the spillover area increases by one meter. Anything in the spillover area is automatically hit, but suffers only a quarter of the weapon's original damage.

The impact of all this mass causes a fair amount of knockback. The target must make a Piloting roll against the base DM of the weapon, plus the MoS, modified by the difference between the DM and the Size of the target (e.g., a x8 water cannon vs. a Size 10 vehicle will reduce the threshold by 2). Humans with BLD of +1 or more count as Size 2 vehicles, otherwise they count as Size 1. Humans roll against their Agility.

If the roll fails, the vehicle is pushed back a number of meters equal to the MoF divided by two, rounded down. If this occurs, Walkers are automatically knocked to the ground (roll Piloting as normal to avoid falling damage). Other vehicles may be overturned. Roll one die: on a result of 1-4, the target remains upright; on a 5-6, the target is overturned.

• LOCATION-SPECIFIC

GENERAL COST MULTIPLIER: X 3 (PER LOCATION) ▼

Because of their nature and/or design, some weapons only attack one location on the vehicle rather than affecting it randomly. For example, land mines cause damage to the movement system, while EMP guns can be designed to knock out sensors and communication devices, leaving the rest of the machine relatively unharmed.

When the weapon is used, the location is not rolled on the System Damage table but is applied directly to the system listed in the weapon's description. Only one of the following may be affected: Movement, Structure, Fire Control or AUX Systems. No more than one location may be bought per weapon.



• MASS DESTRUCTION

AMMO COST MULTIPLIER: X 100,000 ▼

Mass destruction ammunition includes special items like nuclear and thermonuclear warheads, neutron bombs and antimatter death rays. All weapons of mass destruction affect huge zones, giving them a free Area Effect equal to half their unmodified Damage Multiplier. In that zone, their Damage Multiplier is ten times normal (thus, a x10 weapon would cause x100 damage). In a radius equal to the difference between half and their unmodified DM, their Damage Multiplier is five times normal. In the radius up to their unmodified DM times 1.5, their Damage Multiplier is normal. In addition, these doomsday weapons always have a MoS of at least 1, regardless of whether they "hit" their target.

For example, a x10 Mass Destruction weapon will cause x100 damage in a 5-hex radius, x50 in the radius from 5 to 10 hexes, and x10 in the radius between 10 and 15 hexes.



• MINELAYER

AMMO COST MULTIPLIER: X 15 ▼

Minelayer is intended to saturate an area with small multi-purpose land mines. Minelayer ammunition can be designed for almost any projectile or missile weapon. If used as direct-fire, normal munitions, Minelayer adds a -1 modifier to the firer's attack roll. If used in saturation fire, it attacks normally. In addition, the attack's saturation effects remain in that hex until the end of the battle.



• MINIMUM RANGE

WEAPON COST MULTIPLIER: X 1 (0.1 X (MIN. RANGE - BASE RANGE)) ▼

The weapon is unable to fire at a target that is close to its position. It might be a mortar or an artillery piece that fires in a high arc, or a missile that arms its warhead at a certain distance. In game terms, the weapon suffers a -1 modifier for each hex that the target is closer than the weapon's Minimum Range.



• MISSILE

GENERAL COST MULTIPLIER: X 1; AMMO COST MULTIPLIER: X 1 ▼

The weapon is a tube containing one (or more) warheads mounted on a rocket motor, with or without a guidance system. Some missiles are stored in a launcher that contains the fire control system, others are wholly self-contained and fired as a single disposable unit. The weapon uses the Missile ROF rules (see page 156 of the rulebook), but can be defended against with Anti-Missile fire.

Missile weapons have a maximum Base Range of 30 (around Mach 6 if aimed at an airborne target). If the Multi-Turn Seeking option is also selected, range is based on the Margin of Failure of the previous round's attack roll — in effect, the missile corrects its course at mid-point. A MoF of 1 is equal to Short range, a MoF of 2 is Medium range, and so on. Attacks with Margin of Failure of five or more cancel any further attempt, the missile having veered too far off-target. Multi-turn Seeking missiles always move last, regardless of initiative.

Missile ammunition can be used to represent cannon-launched missiles. The projectile is ejected out of the firing tube by a small charge, then ignites its motor to boost itself toward the target. When using this type of ammunition, the weapon uses the Missile rules and ROF cost, but can be defended against with Anti-Missile fire.

A matter to consider is the difference between the missile as a weapon versus the missile as a vehicle carrying a warhead. That is, missiles can either be built as weapons, using this rule set, or they can be built as small, automated vehicles using the normal vehicle design system. Both approaches are valid, although a vehicle-missile will undoubtedly become more cost-efficient as size, range and payload increase. Ultimately, it all depends on what the missile is meant to do: a fast, immediate combat strike (weapon), or a long range, efficient bombardment (vehicle). It should be remembered that a combat turn is 30 seconds long, and that range costs have been calculated accordingly.



• NON-LETHAL

AMMO COST MULTIPLIER: X 1 ▼

Non-lethal ammo is just that: anything that will knock out a man without killing him. This is done through electrical discharges, rubber bullets or low-velocity warheads that deploy "arms" to distribute the impact across a larger surface. Choke or irritant gasses are also possible payloads for Non-lethal ammunition.

In roleplaying, the weapon's Damage Multiplier (vehicular scale) plus the MoS of the attack acts as a Threshold for a Health roll to avoid unconsciousness. If failed, the target is incapacitated for a number of minutes equal to the MoF. Once this period has passed, another Health test may be made every turn to regain consciousness. The threshold is the same as before, but goes down by one after each failure to regain consciousness. In addition, if the roll is failed by between 5 to 8, the subject gains a Flesh wound; by between 9 to 12, a Deep wound; and by 13 or more, the target is dead.

In the tactical game, Non-lethal weapons have no penetration power; only infantry and vehicles with the "Exposed Crew Compartment" flaw can be affected. The weapon's Damage Multiplier is halved, but damage is applied as normal (vehicles are only affected on "Crew" hits). After the battle, casualties are dead on a roll of 6 instead of 4-6 as normal. On a roll of 1 or 2, they are not even harmed.



• PAINT

AMMO COST MULTIPLIER: X 1 ▼

The weapon's shells are hollow and filled with a brightly colored paint (practically any color can be ordered, but day-glo pink and orange are favored). Paint shells cause no damage and are mostly used for training. Observers have a visual spotting bonus equal to the highest MoS of any paint attack when trying to spot a vehicle which has been hit by paint ammunition (multiple hits are not cumulative). Paint ammunition hits have no effect on sensor detection.





● PARRY

GENERAL COST MULTIPLIER: X 1.5 (ONLY AGAINST WEAPONS WITH EXACTLY SAME CHARACTERISTICS); X 2 (AGAINST ANYTHING) ▼

The weapon can be used to deflect blows in melee combat. Only Melee weapons may use this option. A vehicle with a Parry system may expend one action to deflect an attack within the system's arc; the vehicle's pilot then rolls a new defense. If the roll is successful, the defender is still hit, but the weapon subtracts a number of damage points equal to its DM times the parry's MoS.

If a vehicle suffers Light Damage after having successfully parried, the parrying system's Damage Multiplier is automatically halved (rounded up). If a vehicle suffers Heavy Damage after having successfully blocked, the parrying system is automatically destroyed. In either case, no further damage is applied to the vehicle. Overkill results still destroy the vehicle. When not used to parry, the weapon takes damage as a normal weapon.



● PERSISTENT

GENERAL COST MULTIPLIER: X 3 ▼

Persistent weapons cause the target to suffer the attack's effects for a number of combat rounds equal to the original Margin of Success of the attack. Damage is calculated using the original MoS, minus one for each additional turn after the first one. For example, a MoS 4 attack would use MoS 3 on the second turn to calculate damage, MoS 2 on the third and MoS 1 on the fourth and final turn.



● POWER-HUNGRY

GENERAL COST MULTIPLIER: X (1/SQUARE ROOT OF PHI) ▼

The weapon requires an inordinate amount of power and/or attention before firing. The vehicle can do nothing else while preparing that single weapon for firing. A number of actions equal to "PH" must be spent to fire the weapon, with any penalties for multiple actions in a turn being applied cumulatively.



● RANDOM

GENERAL COST MULTIPLIER: 1.05 - (0.05 X RATING) ▼

The weapon has an unpredictable Accuracy, Damage or Base Range. Every time it is fired, the chosen characteristic(s) is affected by a random factor. The user must make a PSY roll against a threshold equal to the Random rating of the system. If the roll is successful, the weapon functions normally. If the roll is unsuccessful, a penalty equal to the Margin of Failure is applied to the chosen characteristic.



● RECOIL

WEAPON COST MULTIPLIER: X 0.8 ▼

The weapon has enormous recoil and cannot be fired on the move; otherwise the vehicle is automatically pushed back a number of meters equal to (DM - vehicle's Size), with a minimum of one. If this occurs, Walker vehicles are knocked to the ground (roll Piloting as per normal fall to avoid damage). Other vehicles may be overturned by the recoil. Roll one die: on a result of 1-4, the vehicle remains upright; on a 5-6, the vehicle is overturned. In space combat, an acceleration equal to 0.01 g (0.1 MP) is applied opposite the firing direction per point of Damage Multiplier.



● REDUNDANT SYSTEMS

WEAPON COST MULTIPLIER: X 1.5 (PER ICON) ▼

The weapon is sheathed in plates of armor or has multiple redundant components. The weapon ignores the first "-1 to a Single Weapon," or "-2 to a Single Weapon," or "-1 to All Weapons," or "Single Weapon Destroyed" result on the Fire Control Damage Table. Redundant Systems is then marked off. The effect can be restored by a Fire Control repair if a technician works on the vehicle after combat. This option can be taken multiple times.



● SCATTER

GENERAL COST MULTIPLIER: X 1.5 ▼

The weapon fires salvos of smaller projectiles bound for the same target point rather than one sudden attack. The weapon can spread its salvo over a larger beaten zone if required. The weapon can increase its Area Effect by one, halving its Damage Multiplier in the process (if the weapon does not normally have an area effect, it gains an AE of 0).



● SEEKING

GENERAL COST MULTIPLIER: X (1 + 2 PER ADDITIONAL ATTACK ROLL); X (NUMBER OF TURNS ACTIVE) ▼

The weapon can try to hit a moving target more than once: missiles which turn and twist to try and collide with an enemy vehicle, or beam weapons that won't fire until locked-on. If the attack fails, the attacker may reroll it. If the target has already spent action(s) to either shoot down, parry, block or dodge the attack, it can defend itself again with the same method at no additional action cost (but normal ammo expenditure).

Such a weapon can also be designed to attack over multiple turns (a large fuel supply for seeking missiles and torpedoes, for example). Unless the weapon has been destroyed, it may attack again at no action cost, up to its maximum number of turns in use. Seeking weapons with the Missile characteristic use more special rules — see Missile, page 129.



● SELF-DESTRUCT

GENERAL COST MULTIPLIER: X 0.2 ▼

The weapon is entirely self contained and is destroyed when used. Self-Destruct weapons do not have ammunition — they are a one-shot tool and are completely destroyed when used, whether the attack was successful or not. Self-Destruct weapons can use any of the special Ammunition Characteristics by dividing the Characteristic cost by 10, with a minimum cost multiplier of 1.



● SHIELD

GENERAL COST MULTIPLIER: X 6 ▼

The weapon can be used to block enemy attacks and absorb some or all of the damage. A vehicle with a Shield system may expend one action to block an attack within the shield's arc; the vehicle's pilot then rolls a new defense. If the roll is successful, the vehicle is still hit, but the shield subtracts a number of damage points equal to its DM times the shield block's MoS.

If a vehicle suffers Light Damage after having successfully blocked using its shield, the shield's Damage Multiplier is automatically halved (rounded up). If a vehicle suffers Heavy Damage after having successfully blocked using its shield, the shield is automatically destroyed. In either case, no further damage is applied to the vehicle. Overkill results still destroy the vehicle. When not used to block, the shield takes damage as a normal weapon; if its total penalties reach -5, the shield is destroyed.

Vehicles may not carry shields whose DM is greater than their Size rating. When not actively blocking, the shield adds one-quarter of its DM (rounded down) to the vehicle's base Armor in the shield's arc.

● SHIELD (ENERGY)

GENERAL COST MULTIPLIER: X 2 (ONE ATTACK TYPE), X 5 (ALL ATTACK), X 1.5 (ALLOW FOR WEAPON FIRE) ▼

Many Jovian scientists have theorized that the screen generator concept will one day be pushed further to create the classic "force field" of science fiction. Depending on their nature, these systems could only be used against a particular form (or forms) of attack, such as energy or matter. Someone once joked that if paranormal powers really existed, a shield could probably be designed to work against them, too.

A vehicle with an Energy Shield system uses the same basic rules as a physical one. If the Energy Shield is designed to be used against only one type of attack (either matter, energy or psychic), then it cannot affect the others. Energy shields bought with an Area Effect allow other units within the AE to benefit from its protection. Active energy fields prevent weapon fire by the protected unit(s), unless the shield is designed to allow it. In the **Jovian Chronicles** universe, the shield mode of the PDS systems is a matter-only shield that allows weapon fire.



● SLOW

WEAPON COST MULTIPLIER: X (0.25 + 1/R) ▼

The weapon needs time to recharge between shots, or reloading it is a complex operation that takes a minimum of time regardless of the loading crew's skills. The weapon can only be fired once every R roleplaying turns (minimum two). Roleplaying turns are six-second time intervals; there are five RPG turns per tactical turn.



● SMART

GENERAL COST MULTIPLIER: X (2 + RATING) ▼

The weapon is equipped with a tiny computer brain that allows it to operate by itself. For example, a close-in defense gun might be self-targeting, a missile could be of the fire-and-forget variety, or a flare launcher could activate as soon as an incoming missile is detected.

The Skill level of this virtual gunner is equal to the rating of the Smart characteristic. No weapon can have a rating higher than 3. The Smart gunner has one action per turn. No crew action needs to be expended when using a Smart weapon, but a logical "program" of up to ten words must be given to each ("Fire on all incoming missiles" would be a valid program).



● SMOKE

AMMO COST MULTIPLIER: X 1 ▼

The shell contains a volatile gas mixture. When it explodes, the contents vaporize into thick smoke of whatever color was chosen (usually black or light gray). The smoke covers one hex both horizontally and vertically (unless the weapon or ammunition also has an Area Effect, in which case add one to the weapon's normal AE) and has an Obscurement of 2. The mist will dissipate at the end of the next turn.

Smoke shells have no penetration power and thus no effect against armor. Only visual and passive detection are affected by the Obscurement modifier. Active Sensors are not affected by smoke.



● SMOKE/BLACK FOG

AMMO COST MULTIPLIER: X 5 ▼

This heavier version of the standard smoke round is slightly more complex. The shell contains a volatile gas mixture, but also chaff, flares and electronic dummies ("noisemakers"). When the shell explodes, the contents cover one hex both horizontally and vertically (unless the weapon or ammunition also has an Area Effect, in which case add one to the weapon's normal AE), creating a zone with an Obscurement of 2. The effect will dissipate at the end of the turn after the next.

Black Fog shells have no penetration power and thus no effect against armor. All types of detection are affected by the Obscurement modifier, including Active Sensors.



● STEALTH

GENERAL COST MULTIPLIER: X 1.5 ▼

The weapon has been designed with stealth in mind. It is equipped with additional systems, such as muzzle flash suppresser, silencer, counter-noise emitter, IR baffler, etc., so that it does not attract attention to the firer when it is used. The weapon does not subtract from the vehicle's Concealment when fired.



● SUBROC

AMMO COST MULTIPLIER: X 1 ▼

Subrocs are missiles (or shells, or whatever) that have been specially modified to allow them to be launched from underwater firing platforms, like submarines. They are fired from watertight tubes, rapidly rise to the surface of the water and, once airborne, speed towards their target. Subrocs allow submerged vehicles to attack surface, land, or aerial targets without surfacing. They cannot otherwise be used for submarine or land fighting.



● TIME DELAY

WEAPON COST MULTIPLIER: X 0.5 (PRE-DETERMINED TIME), X 2 (REMOTELY-ACTIVATED) ▼

The system can be set to activate after a pre-determined number of turns. A more expensive version can also be activated by remote-command from a pre-designated unit. Remotely-activating a Time Delay system requires either a LOS to its location, a satellite uplink or a forward observer. An Electronic Warfare roll must be made against a threshold of 2, modified by the vehicle's Communication rating. This roll costs one action. A successful roll means immediate activation. A failed or fumbled result means the signal was not received and the device does not activate.



● TRANSORBITAL

WEAPON COST MULTIPLIER: X 10 ▼

The weapon has been optimized to be able to fire out of the atmosphere. Its range is not actually boosted, it is just calibrated to take into account atmospheric conditions. Transorbital weapons allow ground and flying vehicles to attack space targets in low orbit. Range is counted as if the weapon was in space (500 meter hexes).



● UNDERWATER

GENERAL COST MULTIPLIER: X 1 (UNDERWATER ONLY), X 2 (BOTH ENVIRONMENTS) ▼

The weapon and its ammunition (if any) are designed for an aquatic environment. The weapon can be fired from an underwater vehicle at other underwater vehicles or at vessels floating on the surface of the water. Some underwater weapons, such as torpedoes, can only be used underwater. Weapons that can function in both environments cannot shoot from one to the other, but may be used in either.





● UNRELIABLE

WEAPON COST MULTIPLIER: $X (1 - [0.01 \times \text{RATING}])$

Some weapons are badly designed or built with low quality material; others are highly experimental and not quite ready yet for general distribution. The weapon overheats, jams or otherwise fails, often with deadly consequences.

Whenever the weapon is fired, the user must first beat the rating with two dice to avoid weapon problem; -1 is applied to the roll for each point of ROF used. For example, a weapon with a Rating of 3 will require a roll of 4 or more to avoid a problem. If a problem does occur, check the Margin of Failure on the Weapon Trouble table below.

An overheated weapon can be fired while overheated, but immediately rolls against its Rating with a -2 modifier. If the weapon jams or otherwise fails, it cannot be fired until cleared or reset. Clearing the weapon requires one action and allows another roll; if the roll fails, the weapon remains jammed. A fumble results in a permanently jammed/fused weapon (a technician will be able to clear it after the battle, though). Obviously, a weapon that exploded is useless as well.

WEAPON TROUBLE

MoF	Problem
0	Weapon overheats for one Turn
1	Weapon overheats for two Turn
2	Weapon jams
3	Weapon jams
4	Weapon jams; lose 1d6 shots of ammunition in clearing it
5	Weapon damaged; -1 Accuracy or add one to Unreliability rating
6 or more	Weapon explodes; DM times (MoF-5) vs. half vehicle's Armor (rounded down)



● WIDE ANGLE

GENERAL COST MULTIPLIER: $X \text{ WIDE ANGLE MULTIPLIER}$

The weapon's attack covers a wide area, attacking multiple targets at once. A single attack roll is made, but any unit within the affected area and within range must defend against it, friend and foe alike. Solid terrain features like hills and structures will absorb part of direct fire wide angle attacks (see *Hull Down Positions*, page 85), but not indirect fire ones. An angle of 10 degrees will cover a path one hex wide along the entire length of the beam — not entirely accurate, but a good game representation. A 60-degree angle has the same shape as a "Fixed" weapon arc. The 180- and 360-degree angles are identical to the "F" and "T" fire arcs, respectively.

WIDE ANGLE MULTIPLIER

Angle	Multiplier	Angle	Multiplier
10	2	180	8
60	4	360	16



● WINCH

GENERAL COST MULTIPLIER: $X 2$

Winch weapons are attached to a high-strength cable, which is itself attached to a winch. The maximum weight that can be handled by the cable is equal to the Damage Multiplier expressed in Size capacity. For example, a x3 winch could drag a weight equivalent to Size 3, or 1.1 tons. Several cables can be used together to pull more weight. Thus, two x3 cables could drag up to 2.2 tons together. More weight will cause the cable to snap. The cable itself can take up to the DM in Damage Points before being severed. Ranged attacks have a -3 penalty to hit because the cable is so small. Point-blank attacks on the cable have no such penalty.

The target will be dragged towards the winch at a rate of (Size of target/Min. Size of winch) tactical hex/turn if the target has a smaller Size rating than the firing unit. The winch vehicle will be dragged towards the target at a rate of (Min. Size of winch/Size of target) tactical hex/turn if the target has larger Size rating. If one of the two is braced, it counts as being one and a half times its actual Size. A target actively resisting being dragged adds its towing capacity to its weight.

STEP THREE: WEAPON AND AMMUNITION COST

Each weapon has a Base Weapon Cost that is calculated using one of the following formulas. The weapon's Base Cost is rounded to the nearest whole number. The actual Accuracy value is not used in the formula; check the Accuracy Multiplier table for the proper number.

FORMULAS

If ROF = 0, ROF cost = 0
If ROF ≥ 1 , ROF cost = $(0.5 \times (\text{Damage Multiplier} + \text{ROF bonus}))^2$
• For Ranged Weapons (range 50 meters or more):
Base Weapon Cost = Accuracy Multiplier $\times ((\text{Damage Multiplier})^2 + (\text{Base Range in hexes})^2 + \text{ROF cost})$
• For Melee Weapons (range less than 50 meters):
Base Weapon Cost = Accuracy Multiplier $\times ((\text{Damage Multiplier} + 2)^2 + \text{ROF cost})$

Accuracy Score	Multiplier	Accuracy Score	Multiplier
+5	180	-1	0.667
+4	36	-2	0.5
+3	9	-3	0.4
+2	3	-4	0.333
+1	1.5	-5	0.286
0	1		

The cost of each shot is calculated separately, allowing vehicle and weapon designers to customize the offensive payload according to their needs. Point-wise, the rules do not differentiate between the various types of ammunition: missile, shell, capacitor, etc. All that counts is the actual game effect: the weapon attacks once.

Base Cost per shot = (Base Weapon Rating w/o ROF bonus + 250)

The Base Cost that was just calculated for the weapon will be modified by the "General" and "Weapon" Characteristics chosen for it (if any). The basic weapon cost is multiplied by the cost multiplier of each selected Characteristic. Weapons with lots of characteristics are going to cost a great deal more than specialized weaponry.

Like the weapon's cost, the basic cost of the weapon's ammunition (if applicable) will be modified by the characteristics chosen for it. The basic ammunition cost is multiplied by each applicable "General" or "Ammunition" Characteristic cost multiplier. It may be necessary to do this several times if more than one type of ammunition is made available for the weapon. Cross-weapon compatibility, such as caliber, may be freely decided by the designer.

The weapon or system is now well defined, but a few more things are needed to make it complete. The first is to find out the weapon's Minimum Size requirement — it is hard to mount a tank gun on a bike — then select the ammunition feed system, provided that one is required. Special design features, like multi-function weapons or mated assembly, are also determined at this design stage.

This is the minimum size of vehicle that can accept the weapon. It may be due to mass, volume, recoil or energy requirements, but the weapon cannot be used by a vehicle smaller than this. This value may increase according to the ammunition carried internally (see *Ammunition Feed*, further on).

Vehicle weapons are divided into two categories: normal and HEAT (High Energy Anti-Tank — not the usual military acronym, and tank here implies armor more than anything else). HEAT weapons rely on heat and energy rather than impact to damage their target, so they do not have to withstand high barrel pressure or take heavy recoil into account. HEAT weapons thus take less space and are lighter, but they can be counteracted by special armor and defense systems, lowering their overall efficiency. Minimum Size rounds to the nearest whole value.

The Minimum Size required to mount the weapon may be reduced through the use of higher technology to miniaturize the weapon's components. Inversely, a lower technology setting might force the adoption of large systems, thereby increasing the required size. Miniaturizing a weapon affects its cost, but enlarging it does not.

Minimum Size = cube root (Weapon Rating/2)	if normal weapon
Minimum Size = [cube root (Weapon Rating/2)] x 0.75	if HEAT-based weapon
Final Threat Value = (Current Threat Rating x Old Required Size) ÷ New Smaller Size	

◇ AMMUNITION VOLUME AND WEIGHT

It is assumed that the engineers will have planned enough space to fit the ammunition called for by the design. It might be necessary, however, to know how much space and weight are required when transporting ammunition as cargo. These numbers include weight and volume of the container.

A weight is assigned to the weapon system to give a basic idea of the weight of the ammunition. The weapon's Minimum Size is used as the weapon's Size in the Size-to-Mass table; the lowest mass is used, divided by ten.

□ FORMULAS

•	Weapon's Mass = lowest mass in equivalent Size bracket, divided by 10
•	Ammunition Mass (per shot) = (Weapon's Mass) divided by 100*
•	Ammunition Volume (per shot) = (Ammunition Mass) squared

*Divide by 10 if the weapon has the Missile characteristic.

◇ AMMUNITION FEED

Weapons with ammunition can be fed through an internal magazine (fixed internal belt-feeding, auto-loader, etc.) or by "clips" (actual ammo clips, single shots, external belt, removable battery packs, energy crystals, etc.). Ammunition stored in magazines is entirely internal to the vehicle and is fed to the weapon through the inside. Because of this, extra ammunition will increase the required Minimum Size of the weapon, and make it bulkier and more massive. Multiple ammunition types can be stored within the weapon's bay, but switching between types requires one action.

The Maximum Ammunition Load table shows how many shots can be carried for each weapon. Cross-index the Weapon's Min. Size with the difference between it and the vehicle's actual Size: that's the maximum number of shots permissible. Transporting yet more ammunition for the gun makes it bigger and heavier, so the vehicle Size must increase (or the Min. Size decrease). For example, a Size 6 vehicle cannot carry more than 160 shots (of any type) for a Min. Size 4 weapon. Each weapon gets its own ammunition bin, so the above vehicle could carry two Size 4 weapons with 160 shots each.

□ MAXIMUM AMMUNITION LOAD

Weapon's Base Minimum Size	Difference between vehicle's Size and Weapon's Minimum Size					
	0	1	2	3	4	5
1	625	2500	10,000	40,000	160,000	640,000
2	80	320	1280	5120	20,480	81,920
3	25	100	400	1600	6400	25,600
4	10	40	160	640	2560	10,240
5	5	20	80	320	1280	5120
6	3	12	48	192	768	3072
7	2	8	32	128	512	2048
8 to 9	1	4	16	64	256	1024
10 to 19	1	3	9	27	81	243
20+	1	2	4	8	16	32

◇ CLIPS

Clips, being external to the weapon, do not increase the Minimum Size required to mount it on a vehicle. Rather, the ammunition clips are mounted on the exterior hull of the vehicle. This makes the clips vulnerable to damage. Each clip counts as an AUX system — Light Damage destroys one clip, Heavy Damage destroys one die's worth. Destroyed clips explode, causing damage equal to the DM of the ammunition directly to the hull. It is possible to protect the clips or transport them internally, however: see the Ammo Storage Perk, page 112.

Clips can also be damaged while in the weapon. When rolling a Fire Control damage result (sub-table A), it is also possible to read "Clip Destroyed" instead of the first two results of the table. The usual procedure (see *Damage*, page 158 of the rulebook) is used to decide which option is applied.

Changing clips requires one action and the presence of either a Manipulator Arm or a dedicated ammo-loading Tool Arm (either of which must have a rating of at least half the weapon's Minimum Size). The number of shots stored in each clip is left entirely to the designer's discretion, but is subject to the same rules as internal ammo bays (see table above). Large clips last longer, but more ammunition is lost if they are destroyed.

Any type of ammunition can be stored within a single clip, but the order in which the ammo types are loaded must be noted and then followed. It is often simpler to place one ammo type per clip and get multiple clips.

HAND-HELD WEAPONRY ◇

If one or more Manipulator Arms are present, any weapon can be designed as "hand-held" in a rifle-like mount. Rifles are somewhat more fragile, since they depend on the arm carrying them, but they are also more flexible tactically. Weapons in rifles use the arm's Size rating for Minimum Size determination. Each arm can handle up to one and a half (rounded down) its Size rating in weapon's Min. Size (this includes increases in size due to ammunition). For example, a Size 6 arm can bear two Min. Size 4 weapons, but not two Min. Size 5. Most rifles are clip fed.

Rifles can be picked up or put away at the cost of one action, as long as the manipulator is still functional. It costs no action to drop a rifle. If the Manipulator Arm is destroyed, or if the rifle is dropped, the rifle can be picked up by another manipulator-equipped unit with a free hand.

MULTI-FUNCTION WEAPONS ◇

Multi-function weapons are systems that can perform more than one function; for example, a laser rifle can fire powerful single shots or switch to a wide-angle beam sprayer by readjusting its focal array. The advantage of this is versatility with greatly reduced cost and space. On the down side, if the weapon is damaged, all functions are equally affected.

Each function is designed as a separate weapon. The cost is equal to the full price of the most expensive function, plus half the cost of the second most expensive function, plus a quarter of the cost of any other functions. The space required is equal to the Min. Size requirement of the largest function of the weapon. Switching between functions is instantaneous and costs no action, except when playing with the Roleplaying scale (6-second turns) where one action is required.

MULTI-FUNCTION COST □

•	Cost = Full price of first one + half price of second + quarter of any subsequent
•	Min. Size = Min. Size of largest weapon

MATED WEAPONS ◇

These are weapons that share some of their components, e.g. double-barreled shotguns. This reduces the overall cost and weight somewhat, and the weapons automatically count as linked for action purposes. Because they share some components, however, both takes damage if the vehicle is hit.

MATING COST □

•	Cost = Full price of first one + three-quarter price of second + half price of any subsequent
•	Min. Size = average Min. Size of all weapons, rounded down

SPLIT WEAPONS ◇

Split weapons are systems that only work when all components are present. These components do not need to be carried by the same vehicle. The "overall" weapon is designed as normal; Min. Size and mass must be determined. The mass is then split between the vehicles as desired, with Threat Value costs being assigned proportionally. The Min. Size for each component is reverse-engineered from their masses (see page 136).

To fire the weapon, all vehicles carrying components must end their movement in the same hex and each must spend an action. Components are damaged like normal weapons, and any damage affects the whole weapon (e.g. if three components had -1, -1 and -2 Acc damage, then the combined weapon would have -4 Acc). If any component is destroyed or does not combine with the others, the weapon cannot function.

Ammo adds to the Min. Size of components at the original Min. Size costs. For example, if a weapon with Min. Size of 6 is split into two Min. Size 4 components, then ammunition adds to them at Size 6 rates (see table on page 136). If a component can be fired as an individual weapon, it is designed normally and uses its mass as the component's mass. The Threat Value is the largest TV (component or individual), plus half the other.

STEP FIVE: RECORDING DATA ▼

The new weapon or system is now complete. All Threat Ratings should be rounded to two significant numbers: only the two leftmost numbers are kept, the rest being replaced by zeros. For example, a weapon with a cost of 756 would become 760. Ammunition costs are affected too: for example, ammunition with a cost of 0.079 would become 0.1 per shot. This simplifies vehicle TV calculations and still reflects the weapon's combat capabilities.

All that is left to do is enter its game stats on the relevant vehicle sheet. If the weapon is to be used on several different designs, the stats can be written down on a standard index card for future reference.

► COMPUTERS

The technological development of computers reached a new level in the early twenty-first century with the introduction of cheap and efficient neural network-based architecture. The advent of expert systems, capable of learning from their mistakes and of re-programming themselves, had a tremendous impact on artificial intelligence research (see *Artificial Intelligences* on the next page) and on the capabilities of personal computers.

Computers and other data-processing circuits are a standard component of modern technology. Many computer systems of the twenty-third century can be considered to be "artificially intelligent," though this does not imply sentience. Whereas computers used to be simple overgrown calculators, they now exhibit surprising resourcefulness. They use very complex sets of heuristic subroutines to interpret their operator's wishes and discover solutions that best fit the problem at hand. These computers (and the programs they use) are fairly unregulated and in most places can be bought by anyone who has the money for them.

▼ STANDARD COMPUTERS

Computers are described in Silhouette with the following attributes: Creativity, Knowledge, Processing Power and a series of programs called Modules, similar in effect to a character's Skills. Creativity and Knowledge are used in essentially the same way as for characters, and represent the computer's abilities to find new solutions (CRE) as well as relying on past experience and pre-programmed routines (KNO) to solve problems and accomplish tasks, using the proper Modules (Skills). Most standard computers will have decent KNO scores but abysmal CRE scores, reflecting their limited capacity for extrapolation and problem-solving.

This Processing Power gives the number of dice the computer can use to accomplish various tasks at the same time. For example, a computer with a Processing Power of 1 can only do one thing at the time, using one die. A computer with a Processing Power of five, on the other hand, could do five tasks at the same time, giving one die to each, or concentrate on only one task using five dice, do three one-die task and one two-dice task, etc. In the same manner as humans, only the highest die counts, with additional sixes each adding one to the total; the Attribute bonus related to the Module used is added to the final roll.

All active Modules must be allocated at least one die; inactive Modules take one combat round to boot-up, while active Modules can be interrupted instantly. The same Module can be loaded more than once. It is assumed that the basic functions of the computer, like those related to the maintenance of the vehicle or location in which they are installed, always succeed as long as at least one die is maintained for the proper Module. A number of Modules equal to the square of the Processing Power may be carried in the immediate access memory of the computer. A number of modules equal to the cube of the PP may be stored, but require one minute to be loaded.

Computers have one action per active module, regardless of the number of dice assigned to it. Helping an operator with a task takes an action. Only Artificial Intelligence (see p. 137) can opt to take extra actions like human beings. When they do, they get the same negative modifiers.

A computer can never put more than five dice on any particular task. Unused dice can be put into any currently running Module, instantly and at any time. A computer fumbles only if it rolls ones on all of its Processing Power dice. If a particular task would indicate a possible fumble, immediately roll for all other currently running Modules (except Backup System Modules, if any is present). If all die rolls are fumbles (unlikely, but possible), the computer crashes. Unless it was running the Backup Systems Module (see below), it takes a number of 6-second combat rounds equal to its Processing Power to reboot, without any Modules loaded.

Large mainframe computers are made up of smaller units which break up a problem into smaller ones and work on them in parallel. This is practical for Academic problems, which involves a lot of cross-referencing and number-crunching. Computers working in parallel may pool all their dice and use the highest applicable Attribute. They require one additional 6-second turn to compile the information before producing a result.

The cost of commercial computers depends on their Attributes. For computers with Processing Powers of eight or less, cost is equal to (PP squared) in thousand of credits, plus Modules and peripherals. The base cost is multiplied by two for each Attributes (CRE or KNO) higher than +3. Computers with PPs higher than eight cost a number of credits equal to (PP cubed), multiplied by 1,000. While computer with Attributes higher than +4 can exist, they are likely to be very uncommon and fairly large (most of them will be megacomputers used to run entire colony cylinders).

All computers are assumed to come with standard communication links (generally very thin but sturdy optic fiber cables), hardware and operating software, as well as advanced encryption systems. Other peripherals (see page 140) must generally be bought separately. The cost of computers installed in a vehicle is already included in the vehicle's Final Cost. A computer's physical size is determined by its Processing Power: one kilo for every point of PP. A computer can be physically smaller than this, at a proportionately increased cost. For example, a computer with a PP of 4 (a normal four kilos) that would weigh only two kilos would cost twice as much. Note, however, that the size and final price of the machine can be further adjusted depending on the technological level of the computer's manufacturer.

ARTIFICIAL INTELLIGENCES ▼

Artificial intelligences (shortened to AIs) are similar in essence to standard computers, save for one very important aspect: they are sentient (as far as any psychological test can determine), have "personalities," and sometimes give the illusion of experiencing emotions. The requirements of the Edicts have imposed strict regulations on the development of artificial intelligences. Modern computer programs are equipped with safeguards that prevent them from evolving outside of certain parameters, and thus all artificial intelligences have been intentionally designed (or allowed) to evolve under strict supervision. No AI may be installed within a mobile shell or connected to a network. They have built-in limitation subroutines to "chain" them and prevent them from running amok, and the few experimental AIs in existence have been carefully developed with benevolent, subservient personalities.

In game terms, Artificial Intelligences are considered to have Psyche and Willpower Attributes in addition to the usual Creativity and Knowledge. Their Processing Power is determined separately, though it will never be below five. Willpower is mostly used as a substitute Attribute for Computer Security Modules (see *Computer Security* below) and for virtual combat between two AIs, while Psyche determine the mental stability of the construct.

AIs can allocate up to seven dice to any particular task, and they never fumble. Being at the apex of neural network architecture, AIs tend to learn much faster than other types of expert systems; they can even acquire new Modules by experience. If an AI attempts to solve a problem or accomplish a task for which it does not have the appropriate Module, it must put two dice into the task, using CRE for the ability bonus; the result is equal to the lowest die rolled. Each time it succeeds at a task with a Threshold of at least 5 without having the necessary Module, a CRE roll is made against a Threshold of 12, adding to the roll the previous success at a similar task (i.e. that would use the same Module). If it succeeds, it is considered to have acquired the new Module, and from now on can load it at any time.

Because they are so much more powerful than non-sentient computers, the sale of AIs is generally tightly controlled. Their market cost is usually ten to a hundred times more than a commercial computer of the same Processing Power.

MODULES ▼

Modules can either be bought or developed by a AI's own expert system; neither hold an advantage over the other, except that ready-made Modules are usually available when you need them. Modules are divided into three basic types: Academic, Hardware and Vehicular (a fourth type, Computer Security, is detailed in the *Computer Security* section, page 140). Each Module has a certain sophistication, reflected in the maximum number of Processing Power which can be used to run them. For example, a Drive 2 Module may not have more than two dice allocated to it, even if the computer has a higher PP.

Academic Modules are used for tasks which are oriented towards the gathering and analysis of factual information; these Modules are designed to assist research and execute routine tasks such as bookkeeping and archiving. A computer with an Academic Module help a human operator by giving him more dice to roll. First, a Module roll is made against a Threshold equal to the operator's Skill level plus the related stat bonus (for example, a person with Skill level 2 with an Attribute of +2 would result in a Threshold of 4). If successful, the operator gets a number of additional dice equal to the Margin of Success, up to a maximum of 5. The operator must have the Skill affected by the Module in order to get a bonus, otherwise the Module is useless. AIs use Academic Modules as if they were the equivalent human Skills.

Hardware Modules are tied to specific pieces of equipment, such as sensors or communication equipment. These are often automated systems; human operators have no real effect on the computer's performance when it activates these Modules. Most are event-driven, which means that a roll is required only when a particular event happens (i.e. an object coming into the sensors' range, etc.). The cost for hardware Modules includes the appropriate interface but not the hardware itself.

Vehicular Modules are similar to Hardware Modules, insofar as they control hardware components, more specifically as part of vehicular equipment. They are usually not as automatic as hardware Modules, often requiring an operator (or an AI) to correctly function; refer to each specific Module for a more thorough description of the Module's effects. The cost for vehicular Modules includes the appropriate interface but not the vehicle itself. Modules have no effect on Threat Values — their cost is subsided into the computer's own TV cost.

The following Modules are addition to the list found on page 180 of the *Jovian Chronicles* rulebook. Additional Modules may also be developed from the list of Skills by the Gamemaster as he sees fit.

ADMINISTRATION (KNO) □

Type:	Academic
Frequency of roll:	On request or Quarterly
Cost:	500 per die

This Module is used to assist managers, clerks and accountants in the daily operations surrounding the administration of a company or other organization, or boost the operator's Bureaucracy or Business Skill. They can also manage automatic bookkeeping systems: roll once every three months of game time. The Margin of Success or Failure with this quarterly roll indicates a percentage in profit gain or loss for those three months.

□ LAW (KNO)

Type:	Academic
Frequency of roll:	On request
Cost:	1,500 per die

The Law Module is designed to help lawyers and judiciary personnel deal with research and the more arcane aspects of civil and criminal law. Each Module deals with the law of a particular world, and is generally not compatible with the law codes of other worlds.

□ NAVIGATION — NAVAL (KNO)

Type:	Vehicular
Frequency of roll:	Once per trip
Cost:	1,900 per die

This Module greatly simplifies the job of sea and ocean navigation for all kinds of watercraft. It improves the navigator's Skill and compensates for currents, winds and other potential navigational predicaments. The computer receives a +1 bonus to the Skill roll if the vehicle is equipped with a Satellite Uplink and there are navigation satellites available. If combined with the Autopilot Module, it can actually steer a ship by itself (roll normally for both Modules).

□ SOCIAL SCIENCE (KNO)

Type:	Academic
Frequency of roll:	On request
Cost:	1,200 per die

This category of purely Academic Modules is used by sociologists and other humanities professionals to enhance their Skill. It includes powerful statistics tools as well as comprehensive filing systems.

□ BACKUP SYSTEMS (CRE)

Type:	Special
Frequency of roll:	Whenever the computer crashes
Cost:	500 per die

This special Module is used to prevent system crashes on non-AI computers. Whenever a computer crashes, either from a general fumble or security breaches, it can recuperate some of its processes if at least one die had been allocated to the Backup Systems Module; a Module check is rolled, against a Threshold equal to the number of Modules that are currently running on the computer (including Backup Systems).

The Margin of Success indicates how many processes continue uninterrupted, from the smallest to the largest; the others must be re-loaded, at the rate of one per combat round. A failure means that all processes were lost, but the computer did not crash, and does not need to reboot; a fumble indicates that the computer crashed, and must be rebooted (see *Standard Computer Operations*, p. 136).

□ DEMOLITION (CRE)

Type:	Academic
Frequency of roll:	On request
Cost:	1,700 per die

This rather unusual Academic Module is used by demolition expert to assist them in the preparation, placement and deactivation of explosive charges. It only serves to boost the operator's Demolition Skill, and does not have any automatic system options.

□ GUEST (CRE)

Type:	Vehicular
Frequency of roll:	Special
Cost:	5000 per die

The rare Guest Module is used to give a human operator sensorimotor control of a vehicle by pirating its interface. The program allows the operator to "be" inside the robot or vehicle (the vehicle must be designed for remote piloting — see page 86), input and output being carried through high-speed digital communications lines (i.e., both computers must have access to a functional Communication system).

Successful use of the Module is rolled for only once, when the Guest attempts to connect. The resisting computer rolls its own CRE or WIL to resist. If the takeover is successful, one die of Processing Power must be put in the Guest Module for every Module to be run by the remote, but the Guest computer can use all of the remote's unused Processing Power and Modules (only with the Guest's own stats, however).

INVESTIGATION (CRE) ▢

Type:	Academic
Frequency of roll:	On request
Cost:	3,000 per die

This rare and powerful Module is used mostly by law-enforcement agencies, as it is designed to assist with all stages of an investigation. It is a powerful analytic tool which can greatly help an investigator to explore any hypothesis, analyze evidence and connect seemingly unrelated elements to form a bigger picture. The normal rules for Academic Modules are used; this Module cannot act independently of an operator, nor is it designed to take care of routine tasks.

MANIPULATOR (CRE) ▢

Type:	Hardware
Frequency of roll:	Event-driven
Cost:	900 per die

This is a catch-all Module that deals with all aspects of robotic manipulation and movement. Roll whenever the computer performs an action that would normally require an Attribute check, with the computer's CRE counting as its Agility, with a modifier of -2 to +1 depending on the actual manipulator or movement system.

PSYCHOLOGY (CRE) ▢

Type:	Academic
Frequency of roll:	On request
Cost:	5,000 per die

This rare and expensive Module is most often used for psychological analysis and lie detection. It can only assist an operator, and has no capabilities for managing routine systems. Als often use this kind of Module when they deal with living beings.

TACTICS (CRE) ▢

Type:	Academic
Frequency of roll:	On request
Cost:	2,000 per die

Mostly found among the military and special intervention squads, this Module can help officers gain a tactical advantage over their adversaries. Due to the particular uncertainty related to tactical situations, this particular Module only gives half the normal number of bonus dice, rounded down (i.e. a particular use of the Module which would normally give three dice instead gives just one).

SAMPLE COMPUTER OPERATION ▼

A freetrader spaceship has a main computer with a CRE of +1 and a KNO of +1 along with a total Processing Power of 4, or four dice (needless to say, this is a unusually powerful computer for a trader ship). The computer runs the Sensors and Navigation (Space) Modules at all times, putting one die in each, keeping two extra dice in case of emergencies.

Meanwhile, two hundred kilometers away, two pirate ships are heading for the trader. The Gamemaster judges that detecting them at this distance is a Threshold 5 Skill roll. He rolls secretly the one die affected to sensors: a 5, +1 for the KNO bonus (Sensors is a KNO Module), for a total of 6. The computer detects the ships, but the GM judges the Margin of Success is too small for complete identification, so it tells the crew that two unidentified ships are heading their way. The captain tells the computer to activate the Fire Control and Defense Systems Modules, just in case, putting one die in attack and one in defense. It takes two combat rounds to load both Modules. Now all of the computer's Processing Power has been allocated.

The captain decides that the best defense is a good offense. At this range, it's better to have some assistance from the computer. The weapon officer has Skill Level 2 in Gunnery (space), with +1 PER. The computer rolls against a Threshold of 3 (level 2 Skill +1 attribute = 3) with its single die, +1 for its CRE attribute. It gets a 5, for a MoS of 2. The gunner thus gets two extra dice for one shot, and easily blows up one of the pirates. The gunner is on his own for the next shot, however — he still has actions to fire, but has already used up the available computer power. The surviving pirate ship opens fire on the vessel with a volley of missiles. The pilot uses the Defense Systems module to plot an evasive path. He could also have asked it to activate a defensive system on its own, such as an anti-missile system.

By the next round, the pirate is well within visual range. The captain decides to reallocate the computing power and puts three dice in Fire Control and one in Defensive Systems. Since the modules are already active, there is no delay. Sensors and Navigation are deactivated (they would need at least one die to remain active) and will have to be rebooted. The gunner is busy arguing with the captain and tells the computer to fire on his own. The Fire Control Module uses its single action to fire the ship's main gun with three dice, resulting in a hit and the utter destruction of the enemy vessel.



▼ PERIPHERALS

The following peripherals are usually added to personal or home computers; they are not necessary for the computer to function, but can be essential in making it usable by a human operator. Computers that are built into vehicles always come with the proper interface peripherals as part of their basic cost. They'll have a screen (often a window in the onboard instrument screen), a data input device and a communication link (provided the vehicle has a communication system).

Prices and weight are given for average quality, 2210-era components; older technologies will generally be heavier and bulkier, while new ones are lighter, cheaper (for the equivalent processing power) and more powerful. Price and weight of vehicular computers are included in the vehicle's own statistics.

◇ COMMUNICATION LINKS

All computers come equipped with a data communication link device, except those which are built into a specific device and don't need to access any type of network. Modern computers have the PAN network protocol installed as standard, though local networks may use other types of protocols (Gamemaster's discretion).

◇ INPUT DEVICES

Common input devices include the voice command interface, the dataglove and the stylus, all of them analog-to-digital interfaces which transform the voice or the movements of the user's hand (or body) into computer-readable information. They are usually quite cheap (about 40 credits for voice command module, 20 credits for a dataglove and 15 credits for a stylus) and easy to use.

Keyboards, still very much in use, have always had a number of dedicated followers; data entry is often much faster when done by a trained typist. Keyboards usually cost between 10 and 25 credits.

◇ PHOTOPRINTER

This device provides photo-quality color printouts on normal or synthetic paper (also known as polysheet). The latter is made of special polymers which can be easily recycled, and is thus much more common than the expensive wood-based paper. It can also scan images and store them in digital format. It normally weighs between 0.5 and 1.5 kilos and costs 250-1000 credits. Smaller, more portable versions are available at higher prices. They look like small bars of plastic with four slots, two to feed in originals and paper and the others to eject the material.

◇ REMOVABLE DATA STORAGE

The memocard system has been the most popular form of data storage for decades. It can store up to two levels of Modules (one level 2 or two level 1) on one plastic card approximately 5 x 8 cm in size. The read/write unit costs about 100 credits and weighs a quarter of a kilo. Memocards cost 1 credit each. Memocards with increased memory are available for correspondingly increased prices.

◇ SCREEN

Screens, whether old-fashioned monitors or ultraflat, foldable LCD weaves that can display millions of colors with high resolution, are among the cheapest and most widely available display peripherals for computers and other kinds of audio-video equipment. They usually weigh less than half a kilo, and cost around 75-150 credits. Holographic displays are also available, but cost three times as much and only function within the front 180° arc.

◇ VR SET

VR goggles display the data in RealTone™ (billions of colors) with high resolution on a tiny surface that fits over the user's eyes. Tiny speakers are inserted in each ear for sound. The entire set usually weighs less than a third of a kilo, and costs around 200-300 credits. With their liquid crystal surfaces, the goggles can act as a Head Up Display (allowing normal vision) or as a full immersive environment.

▼ COMPUTER SECURITY

Computers have permeated all aspects of life, including the shadier ones. From personal diaries to state secrets, a lot of the information now stored in computers has always attracted all sorts of data thieves, con people and spies. Fortunately, the encryption theories have successfully withstood the passage of time, and most stored data can only be accessed by its rightful owner (or anyone else who has his or her private key); even the fastest and brightest AIs can only decipher encrypted material with considerable time and effort. Decryption algorithms, as advanced as they are, cannot cheat the theoretical limits that make encrypted material hard to unlock.

► COMPUTER SECURITY CONTINUED

While these developments might have slowed down the computer espionage business a little, it did not end it by any means; destroying information and “bugging” the enemy’s computers, though publicly considered treacherous, is always a possibility. Obtaining personal encryption keys through guile and intrigue has also permitted computer espionage to survive, ironically enough, by using the ancient weapons of deception, seduction and blackmail.

As far as the actual game mechanics of computer security are concerned, there always needs to be at least two computers, the attacker and the defender. Unless the attacker has access to correct security codes and protocols, it will have to “hack” its way in. It either tries to breach security measures, corrupt them or simply “bug” them to get up-to-date reports of their nature and status. The defender tries to prevent the attacker from entering and to trace the attack, so it can either organize a counterattack or notify the authorities; sometimes a defending computer will act as if it did not notice the intrusion and feed false information to the invader. Whenever two computers clash in such a manner, an opposed Skill test between the attacker’s attack Module and the defender’s defense Modules is made, each with a number of dice corresponding to the amount of Processing Power put into them.

The presence of a human operator can help either computer fare better against its opponent, in a manner similar to the effects of an Academic Module, but reversed. This time, the operator must roll his Computer Operation Skill against a Threshold equal to the total number of dice allocated by the enemy computer for its attack or defense; each point of Margin of Success adds a die to the computer’s, while each point of Margin of Failure subtracts one, to a minimum of one. A fumble dooms the attacking or defending attempt, which automatically fails due to human error.

ATTACK MODULE: “BATTERING RAM” (CRE OR WIL) □

Type:	Computer Security, attack
Frequency of roll:	Event-driven
Cost:	2,800 per die

This hit-and-run Module is used for its raw breaching power, not its discretion. A Battering RAM Module tries to penetrate a computer’s defense by assaulting them with a lot of computer noise, peppered with a few weakening viruses. Once defenses are down, it immediately tries to confer to its computer a superuser access to all of the invaded system’s files and Modules. It does not try to avoid alarm Modules, decoys or tracers, and as such can be rather useless against larger systems.

DEFENSE MODULE: “LABYRINTH” (CRE OR WIL) □

Type:	Computer Security, defense
Frequency of roll:	Event-driven
Cost:	1,500 per die

This simple defense Module simply tries to stop intrusions by filtering all information flow through a complex series of encryption/decryption process, destroying any superfluous code and stalling more aggressive attack programs. When it successfully defends against attacking programs, the Margin of Success count as the number of combat turns lost by the attacker. The Labyrinth defense Module is often combined with alarm and decoy Modules.

SAMPLE COMPUTER ATTACK AND DEFENSE ▼

Yukia, an enterprising young computer saboteur, has decided to break into a local company’s computer network to wreak some havoc. She has the Skill Computer Operation at level 3, and her KNO Attribute is +2. Her computer, a brand new portable model with +1 CRE, -1 KNO, Processing Power of 4, has just been equipped with a Battering RAM attack Module she got from Venusian friends. Yukia has learned from an inside source that the company’s gateway computer is a powerful machine with +4 CRE, +3 KNO, and a Processing Power of 7. According to the manuals she pilfered from a visit at the company’s headquarters (under the cover story of a school trip), she knows that it runs a Communications Module with two dice, a tracer Module with one die and a Labyrinth defense Module with four dice.

Yukia opens the communication channels and decides to intrude with four dice, to give herself all the chances she needs. She also prepares a few contingency sub-routines, just in case, and rolls her Computer Operation Skill. This results in a 6. The number of dice affected to defense by the company’s gateway computer is 5, so Yukia succeeds by (6-5) one point, adding one die to her computer’s attack roll. The attacking computer rolls five dice, but only gets a 5, which added to its +1 CRE bonus gives a 6 as the attacking roll; the defender’s five dice yield a result of 5, plus the computer’s +4 CRE bonus, for a total defense roll of 9. The company’s computer has successfully defended, trapping the attacking program for (9 - 6 =) 3 combat rounds, as specified in the Labyrinth defense Module. Yukia watches as her programs try to give her further access, but are stalled by the defense routines for long seconds. She seriously consider pulling the plug, wondering as to whether or not this will be enough time for the tracer program to unmask her and inform the authorities of her location...

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end of section 6.6 computers



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► FUTURE AND FANTASTIC TECHNOLOGIES

This section covers some of the most unusual options available to users of the vehicle construction process. These options are items that are not yet possible in the **Jovian Chronicles** universe, don't quite fit within the standard design procedures, or items that affect the performance of the whole vehicle rather than just one ability. Some are also well-outside the "hard science" scope of the game. For this reason, these systems and their related rules are grouped here under the header "Future and Fantastic Technologies." Even in 2210, they are considered science-fiction.

The future and fantastic technologies are included here to allow Gamemasters to customize their campaign according to the Players' tastes. Some would like to see giant monsters, other would like to transform the solar system-spanning story into an even more grandiose one with the entire galaxy as a background. Obviously, this requires a few additional rules. This includes technologies such as Faster-than-Light drives, teleporters or just plain weird "special effects," like combining vehicles or morphable machines. They are presented in alphabetical order for simplicity and ease of reference. All are optional and do not have to be used in a campaign.

This section also features some pieces of equipment that have no tactical utility whatsoever, but can be great fun in a roleplaying environment. These do not affect the vehicle's Threat Value but are added to its overall monetary cost. See the listing on Extras on page 148.

▼ ADVANCED TECHNOLOGY

The game system has been calibrated to handle the capabilities of most technological items within a few hundred years' timespan. Extremely long-lived campaigns, however, might find cost and size spiralling upward as Gamemasters try to adjust game stats to reflect a rapidly improving technology base. One solution is to use Technical Levels. Each construct or piece of equipment can be assigned an abstract numerical value that represent how sophisticated the item is. Abstract, because none can predict the future's capabilities. In general, only major conflicts or several centuries of slow development will warrant moving to a higher level. Because they are hard to properly evaluate, Tech Levels are suggested only as a Gamemaster tool for individual long-term campaigns, and will remain an optional rule.

Items of the same technological level are built and used with the standard rules. If pitted against a lower or higher Tech Level, however, the difference between the two is applied to all dice rolls. If using Threat Value and cost to choose units, each Tech Level multiply the cost by ten. Sensor and Comm ranges can also be multiplied by ten when used against systems of lower levels. Non-technological items, such as structures and natural formations, are TL 0 for comparison purposes.

For example, a 2210-era exo-armor can be determined to be a Tech Level 2 vehicle. If pitted against a late 1990 jet fighter (say, TL 1), the exo will gain an automatic bonus of +1 to all die rolls, and both its Sensor and Comm ranges will be multiplied by ten. If the very same exo-armor was found and used by rebels in the year 13,508 to be pitted against TL 7 grav-spheres, the latter would have a +5 modifier to all dice rolls.

▼ BIO-CONSTRUCTS

Bio-constructs are vehicles, machines and robots made of living flesh rather than mechanical components. They may be engineered or naturally bred, and their characteristics may vary wildly. They are somewhat rare, since most applications are easily done by more resilient machines.

For game simplicity, bio-constructs are build just like any other vehicles or machines. In this case, "Crew" indicates not only any onboard crew (if applicable) but also the state of the creature's nervous system (pain and damage will cause actions to be lost). Especially tough or resilient creatures might well have several levels of the Perk "Reinforced Crew" (in this case, it would read as "Tough Nervous System"). Most living beings will also have Self-Repair Systems (see page 148) to simulate their ability to heal naturally.

▼ BIO-ENERGY

Although most machines are equipped with a powerplant, a few weird ones might feature an energy converter that uses the pilot's (or crewmen's) own psychic or life energy for power. Often (but not always), the more emotional the pilot, the more powerful the machine! This unusual perk allows for a great reduction in the cost and size of a machine (since it does not require a large powerplant). This benefit is more than offset by the sub-standard performance of the machine and the extremely limited deployment range of such craft.

When this option is chosen, Movement Speeds and Deployment Range are not chosen for the machine and count as zero for Threat Value calculations. Instead, the maximum speed in hexes (adjusted for air and spacecraft) is equal to twice the pilot's WIL scores (the weak-minded fool who tries to steal the prototype will find that it just does not seem to work for him for some reason). A bonus equal to the absolute value of the PSY Attribute is added to the WIL before multiplying (hence, a -3 PSY would count as a +3). The Deployment Range of such a craft is equal to the Stamina of the pilot times ten. The rating of the Perk is added to the Willpower of the pilot for speed calculation purposes. The Perk Cost of this option is equal to 8 + (rating squared).

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COMBINER VEHICLES ▼

Combiners are vehicles that are fully operable on their own but also possess the ability to connect — “combine” — with other specially designed machines to form a greater and usually more powerful vehicle. The component vehicles don’t just dock together, either, they literally merge into the new unit: each sub-vehicle is equipped with additional systems that allows it to act as part of the whole, effectively allowing the greater vehicle to be more than the sum of its parts. To combine, all vehicles must end their movement in the same hex (if in space, their velocity should be within two points) and spend one action each. The connection is instantaneous (though special effects, panning camera shots and battle cries may make it seem like longer) and the combiner is ready to act on the next turn.

The combiner and the combined machines are designed separately. They need not have the same form, armament or additional systems such as Perks and Flaws; for example, two minitanks could combine to become a large hovervehicle. The weight of the combined machine should be equal to the total weights of the vehicles that constitute its body, however, unless the campaign is firmly set in the fantasy genre. Crew must be accounted for in both combiners and combined forms, that is, any combiner crew that is not used in the combined machine must be given passenger seating or be dropped off before combining.

Each combiner vehicle must be assigned to one of the five following locations on the larger combined unit: Fire Control, Structure, Crew, Movement and Auxiliary Systems. Each location must be assigned at least one combiner (combiner vehicles can be part of more than one location). Whenever one of these locations takes Light damage, one point of Armor is removed from the vehicle assigned to that section (in case of Heavy damage, two points). If more than one combiner vehicle is available in a given location, the damage is assigned randomly. Roll a die: even, attacker chooses, odd, defender chooses. If the combined vehicle receives an Overkill result, it “decombines” into its constituent vehicles, all of which take an immediate Heavy damage result. Until repaired, the combiner vehicles cannot recombine.

The Threat Value and cost are equal to the Threat Value of the combined machine or the total Threat Value cost of all component machines, whichever is greater.

OVERLAY ARMOR ▼

Overlay armor is a removable outer shell that is layered on a vehicle. Overlay armor normally increases the equipment available to a vehicle by adding extra armor and weapons. Occasionally, other devices are embedded into overlay armor. In game terms, a vehicle with Overlay Armor is effectively a different vehicle than the same vehicle without it. New values must be selected for most Attributes when the vehicle is equipped with the Overlay Armor. In addition to choosing new base statistics, new Perks and Flaws may be added to a vehicle. The following table summarizes the information.

OVERLAY ARMOR DESIGN GUIDELINES □

New Statistic	Restriction
Movement Systems	none, but often keep the same one(s)
Speed	none, but speed often decreases slightly
Maneuverability	none, but Maneuver may decrease slightly
Armor Rating	cannot decrease; usually increases by 10% or more
Weapons	may add new weapons; may prevent existing weapons from firing (in effect, removing them)
Sensors	none; may be increased or decreased, depending on design
Fire Control	none; may be increased or decreased, depending on design
Communications	none; may be increased or decreased, depending on design
Deployment Range	none, but Deployment Range often decreases slightly
Reaction Mass	none; may be increased or decreased, depending on design

OVERLAY ARMOR PERKS AND FLAWS □

Perks	Perks	Flaws
* Airdroppable	* Improved Rear Defense	• Annoyance
* Airlift Ready	* Mining Equipment	• Defective Active Sensors
* Aquatic Sensors	• Reentry System	• Defective Fire Control
* Arm (any type)	* Reinforced Armor/Location (any)	• Highly Flammable
* ECM	* Satellite Uplink	* Large Sensor Profile
* ECCM	• Searchlight (any)	• No Sensors
* HEAT Resistant Armor	* Stealth	* Sensor Dependent
* Hostile Environment Protection (any)	• Target Designator	

◇ OVERLAY ARMOR COST

Once the vehicle's stats while clad in Overlay Armor are chosen, Steps 11 to 16 of the Vehicle Design Process (Threat, Size, Cost, Production Type, Lemon rolls and Final Cost) are done separately for the vehicle with and without Overlay Armor. The following minimum values are applied to the Overlayed version. If its values are not high enough, they automatically become the minimum acceptable amount. A vehicle with Overlay Armor gets the Lemon dice from the base model in addition to its own Lemon dice.

A vehicle may shed (but not put on) its Overlay Armor at any time by expending one action. In addition, any Heavy Damage result to the Structure automatically blows off a vehicle's Overlay Armor, reducing the vehicle to its normal statistics. All damage effects inflicted upon a vehicle with Overlay armor is not transferred to the vehicle and is removed when it sheds its Overlay Armor. Crew casualties, however, remain casualties.

□ OVERLAY ARMOR THREAT VALUE AND COST

•	A Perk Cost of 2 points is applied to both the base version and to the version with overlay;
•	Overlayed Version's Threat Value cannot be less than Base Model Threat Value;
•	Overlayed Version's Size cannot be less than Base Model's Size;
•	Overlayed Version's Final Cost must equal to at least (1.1 x Base Model Final Cost);
•	Cost of the Overlay Armor itself is the difference between the Overlayed vehicle cost and the base vehicle cost.

▼ TELEPORTER DEVICES

Teleporters, or devices that allow the transportation of matter over distance without actually traveling it, are not possible according to the current human understanding of physics. The amount of information and energy required to breakdown and recreate the pattern of the object(s) to teleport would be literally cosmic, unless one could "magically" swap two locations in space. A teleporter would also have to correct the incertitude introduced by the Heisenberg principle, which amounts to changing one of the universe's basic laws. Still, teleporters remain a staple of science fiction and these rules would not be complete without suggestions for their use.

Teleport Self: this system allows the vehicle to move to any tactical hex within a radius equal to or less than the rating of the Perk instead of using its normal movement, regardless of intervening matter. Teleporting costs two actions, one to prepare and one to do it — teleporting is a pretty complex act, and most people do not want to end up materializing within another object by being hasty. The Player also has control over which direction his vehicle is facing when it appears. The Perk Cost of this option is equal to 2 x (rating squared).

Teleport Others: this system allows the vehicle to move any other item (person, object or vehicle) within a radius equal to the rating of the Perk to any other hex in range. The item to be moved must have a Size rating less than or equal to the rating of the Perk. The teleporter can also send the object a thousand times further, provided it first spends an action to lock on the target location and remains immobile during the transfer (or do not expend any thrust). It must have no energy shield in action, unless they are permeable to weapon fire (see *Shield, Energy*, page 131).

If the item materializes in the same hex as another unit, the transported item must make an Agility or Piloting roll against a Threshold equal to the sum of the Size of all units present in the hex, divided by five, or collide with a random occupant in the hex. If the item materializes in the same hex as a huge immovable object (such as a space station or a boulder), it automatically suffers an Overkill result unless the large object is hollow (in which case the result is left to the Gamemaster's discretion). The Perk Cost of this option is equal to 5 x (rating squared).

▼ THOUGHT INTERFACE

Very advanced mind-machine interfaces have been in the work for many years. Their development is complicated by the fact that human beings do not seem to control specific actions with equally specific parts of their brain, but rather use different "circuits" every time. Perhaps examining signals coming out of the motor nerves would allow a viable interface. If one of these could be perfected, it would allow the crew to react at the speed of thought rather than lose precious fractions of a second waiting for the order to go through their arms and hands to the controls. The interface may be a brainwave scanner or a surgically implanted jack, but the end result is the same: the crewmember's will is directly transmitted to the vehicle. Its great reaction speed allows the vehicle to have extra actions each combat round.

The primary effect of the interface is to give additional actions; improvements on the vehicle's Maneuverability or Fire Control are represented by the regular stats. The number of actions gained is equal to the number of actions the crew which is interfaced would normally receive. This is in addition to the natural number of actions which the entire crew has. For example, a corvette's crew of 36 has six actions. The captain and his three personal aides are then all hooked up to a Thought Interface system, granting the ship two more actions, for a total of eight actions per turn. The cost of the Perk is equal to 10 plus the number of extra actions gained.

FEEDBACK ◇

Thought-control interfaces often put undue strain on the pilot and his central nervous system. Certain interfaces are more primitive than the perfect control option listed on the previous page. Some cannot filter the feedback signals they send back, others require absolute mental concentration for the entire battle. The following are variants on the thought-control systems that put some limitations on the crew. This, of course, reduces the cost of the interface system; whenever one of the option call for an interface cost, it refers to the Thought-Interface Perk cost on the previous page.

Invasive Interface: the computer gives hints and plot out the paths of targets directly into the crew's minds, giving them a tactical edge. A PSY roll must be performed when the system is activated. If failed, the information totally overrides the crew's mind, causing them to lapse into catatonia in a number of rounds equal to the roll of one die. If fumbled, the interface is too much and the crew is knocked out. The cost of the interface is reduced by the PSY Threshold.

Mind Link: the nervous reflexes of the crew are directly transferred to the vehicle, which effectively becomes an extension of the crew's body and mind. A WIL roll is made every round the system is used; if it is failed, the system confers no action bonus for that round. If fumbled, the system picks up a stray thought and acts on it (GM's call). The cost of the interface is reduced by the WIL Threshold.

Unshielded: damage can surge back into the minds of the crew, possibly causing severe mental wounds. Such a system costs only half the normal point cost, but requires a Knockout test (see rulebook page 117) every time the vehicle receives damage. Light damage to the vehicle causes a -1 penalty to the test, while Heavy damage causes a -2. There is a -1 penalty for each consecutive test during a single turn.

Sentient: the main control computer has been patterned after an animalistic mind. It must be dominated with a WILL roll during the first interface, or it will refuse to obey the crew. If the machine is damaged or the crew emotionally strained (GM's call), a WIL rolls is required or the mecha goes Berserk against its attacker. It will move directly toward it and attempt to engage it in hand-to-hand combat. It may not take any kind of defensive action, but gains a +1 modifier to melee attacks. The cost of the interface is reduced by the WIL Threshold.

TRANSFORMABLE VEHICLES ▼

Transformable vehicles (also referred to as variable platforms) are vehicles that can modify their outer shape and structure to respond to multiple environmental and mission requirements. They are extremely versatile machines, but pay for this by their increased complexity, cost and vulnerability to battle damage.

A transformable vehicle is, for game purposes, two (or more) vehicles that can "swap places" during a battle. Doing things this way allows to create very different forms, each with its own strengths and weaknesses. Fantastic campaigns can even allow the vehicle's modes to be of different Sizes.

Each mode is designed as if it was a separate vehicle. All modes should have the same Size and Crew ratings, however. All other ratings and values can change — deployed antennae can boost the Communication rating or range, wings can unfold to give Flight movement, etc. Here is a quick example: an exo-armor that transforms into a fighter plane and vice-versa. In plane mode, two heavy lasers are located in the plane's nose. These lasers cannot fire when the vehicle is in its exo-armor form because the muzzles are covered by moving parts that support the legs. The plane's sheet will list lasers, but the exo's sheet will not. If the two forms are very similar, it is usually possible to note only the changes in the "Notes" box of a single vehicle sheet. Weapons can have a letter before their name to show the mode(s) in which they can be used.

The total cost of the vehicle is equal to the full price of the most expensive form (called the primary form), plus half of the second most expensive form (the secondary form), plus a quarter of the cost of each subsequent form. The primary form is always the most expensive one, regardless of its actual nature. Even if you are designing an exo-armor that can turn into a fighter plane, if the latter is more expensive it is the primary form (with the exo-armor mode the secondary form).

In each combat turn, the vehicle can transform once at no cost. Extra transformations are possible but cost one action each. Damage to systems is carried over from one form to the other(s), unless the perk Private System (see below) has been bought. Armor damage and crew casualties are always carried over.

PRIVATE SYSTEM ◇

This perk allows a transformable vehicle to avoid damage being carried over to all its forms. The perk must be bought separately for any or all four main sub-systems of the vehicle: Fire Control, Structure, Movement and Auxiliary Systems. When damage is received on a system protected by this perk, the damage does not transfer to the other forms. The cost of the Perk is equal to 2 per system or 7 for all four of them.

▼ FASTER-THAN-LIGHT DRIVES

Faster-Than-Light movement seems to go against everything that is presently known about physics. One has to wait centuries as the ship travel the vastness of space at sublight speed, but FTL drives would make the exploration and colonization of the galaxy possible. Practically any spaceworthy vehicle can be equipped with a FTL drive, provided the scientific background of its world of origin allows it. Some technologies allow only kilometer-long ships to travel between the stars; others enable even the smallest one-man fighter to leap across light-years with disconcerting ease. To get around this problem, the Threat Value and cost of the vehicle are modified solely according to the speed and range of the FTL drive, regardless of the vehicle's physical size and attributes. For example, a Size 6 fighter and a Size 45 warship will both have the same cost multiplier if they have the same FTL speed and range.

The FTL speeds are expressed here in C, whereas C is the speed of light. The range multiplier is expressed in Light Year (LY). For simplicity, only a certain set of speed and range are listed. If the vehicle's stats falls between two values, the closest value is used, rounding up. The Activation Delay is the time required for the system's activation to occur once the controls are set; during that time, the vehicle can do nothing. The cost is equal to the vehicle's Final TV times the FTL Multiplier(s) below.

■ FTL MULTIPLIERS

Speed	Multiplier	Range	Multiplier
1C	x2	1 LY	x1
10 C	x4	10 LY	x2
100 C	x16	100 LY	x4
1000 C	x64	1000 LY	x8
10,000 C	x256	10,000 LY	x16
100,000 C	x1024	100,000 LY	x32

■ FTL MULTIPLIERS

Act. Delay	Multiplier	Limitation	Multiplier
6 seconds	x2	Must be in a specific location	x0.5
30 seconds	x1	Requires special fuel	x0.5
1 minute	x0.9	Requires rare fuel	x0.3
10 minutes	x0.75		
1 hour	x0.5		
1 day	x0.2		

▼ DIMENSIONAL TECHNOLOGY

Dimensional Technology is a catch-all name for the systems that allow access to other realities. If possible, this feat would permit a variety of special functions, such as the ability to store items or additional mass in a nearby pocket dimension for later use. It would also allow, by the same token, voyages to parallel universes or even other times.

◇ DIMENSIONAL MASS

Some vehicles have the strange ability to grow or shrink in size, putting on or shedding mass without any visible means. This can be done through dimensional storage of additional mass, variable-sized molecular structure or atmospheric processing, but the game effect remains the same.

The game effect of this Perk allows a vehicle to add or subtract from its Size a maximum number of levels equal to the rating of the Perk (particularly useful when the snub-fighter grows to the size of a battleship just before impact on a ramming run). A maximum of five Size levels can be shed or gained per round, regardless of the overall capability of the vehicle. The cost of the Perk is equal to its Rating squared.

◇ DIMENSIONAL STORAGE

This often happens in animation: vehicles and mecha suddenly pull out additional weapons or pieces of equipment that just were not there a second ago, or they sprout additional pieces that could not possibly fit within their mechanisms/structure. Although the reasoning behind it might vary, this is called Dimensional Storage: the ability to pull useful gimmicks out of nowhere. This Perk allows the vehicle access to some prepared equipment from an extra-dimensional space with a volume limited by the rating of the dimensional storage. The amount of "cargo" volume supplied is equal to the Rating squared, in cubic meters, with the cost of the Perk equal to its Rating. Vehicles that "extrude" new systems should be designed as Transformables (see page 144).

DIMENSION JUMPING ▼

Dimension Jumping is very similar to Faster-Than-Light flight, game-wise, but instead of going to other star systems, the vehicle can hop across parallel dimensions (or across time). Practically any vehicle can be equipped with a Dimension Jump drive, provided the scientific background of your alternate campaign allows it. The Threat Value of the vehicle is modified solely according to the versatility of the drive, regardless of the vehicle's physical size. For simplicity's sake, only a certain set of parameters are listed. If the vehicle's stats fall between two values, use the closest one, rounding up. If this system represents a time-traveling device, use the # of Accessible Dimensions below as the possible range in years. The Activation Delay is the time required for the system's activation to occur once the controls are set; during that time, the vehicle can do nothing. The total cost (both in TV and money) is the vehicle's Final TV and cost times the Dimensional Multiplier(s) below.

b.7.11

DIMENSIONAL MULTIPLIERS

# of Accessible Dimensions/Range in Years	Multiplier	Act. Delay	Multiplier
1	x1	6 seconds	x2
10	x2	30 seconds	x1
100	x4	1 minute	x0.9
1000	x8	10 minutes	x0.75
10,000	x16	1 hour	x0.5
100,000	x32	1 day	x0.2

DIMENSIONAL MULTIPLIERS

Limitation	Multiplier
Must be in a specific location	x0.5
Requires special fuel	x0.5
Requires rare fuel	x0.3

NANOTECHNOLOGY ▼

Nanotechnology was once thought to be the great salvation of Mankind. Its molecular-sized machines would keep human bodies young and healthy, create objects seemingly out of thin air and disassemble bullets in flight before they could harm the target. Unfortunately, the laws of physics and chemistry blew apart those fantastic dreams. Still, if things had worked out as hoped, nanomachines would have allowed some pretty impressive tricks...

b.7.12

MATERIAL ABSORPTION ◇

A vehicle can be equipped with a specialized kind of nanomachines that can be injected into any material that the vehicle happens to touch. They then modify the structure of the material and attach it to the vehicle, shaping it into a form that will be more useful to the host. This allows the vehicle to gain mass or equipment that it would not normally have.

The system can absorb up to (Rating x 10%) of the vehicle's weight every turn, spending one actions to do so. Any mechanical or electronic system can be used as is if undamaged. If the vehicle is merging with larger objects, it can "take over" with the computer Guest Module and control them. The cost of the Perk is equal to 10 plus the Rating squared.

R

MORPHABLE MATERIAL ◇

Morphable material is composed of many millions of nanomachines holding together to create a seemingly solid surface. By moving the nanomachines around, the material is capable of altering its shape like putty, shifting around to take on new shapes almost at will. The machine may spread its Size points across great distance, as long as there is at least one point per hex. The machine can even split into two or more parts (using the Combiner rules).

Morphable vehicles are effectively a "super-transformable," in that they can take many shapes. All forms must have the same Size and mass, but all other characteristics may be different. When calculating the TV costs, use the highest possible Armor, overall speed (disregard movement systems), Maneuver, and Perks. The resulting high cost is compensated by the machine's versatility and its ability to shrug off system damage.

When a morphable machine is damaged, only lost Armor points and crew casualties (if applicable) are carried over between forms. One action is required to change shape (or, it can "morph" to the same shape, effectively repairing the damage). If the vehicle cannot reproduce complex moving parts (wheels or projectile weapons, for example), its total Threat Value cost is halved (rounded up).



R

◇ SELF-REPAIR SYSTEMS

Either because it is alive or it is equipped with an automatic repair system, the vehicle can “heal” itself and perform its own maintenance. Any and all systems can be healed if given sufficient time and building material. When combined with the No Fuel Required Perk, the vehicle practically never needs to stop!

Each self-repair system generates (Rating x 5) Repair Points per round. Each attempt to repair a damage effect requires a number of Repair Points equal to the vehicle's Size plus a modifier from the Damage Effect Modifier Table. To successfully repair a damage effect, the Player must assign enough Repair Points to cover the cost. Once the required points are expended, the system must succeed a Skill roll, using its rating as its Skill level. The thresholds for the various types of repairs are found in the Repair Threshold table. Failed or draw results fail to produce any result and the Repair Points are wasted. Fumble results produce a Light damage result on the vehicle in addition to failing to produce any repair. Multiply the vehicle's final TV and cost by the Rating of the system to get its final cost and Threat Value.

▣ DAMAGE EFFECT MODIFIERS

Damage Effect	Repair Point Modifier	Damage Effect	Repair Point Modifier
Armor Rating Loss	+1 per point	Fire Control Destroyed	+6
MP Loss	+1 per MP	Power Transfer Failure	+5
Maneuverability Loss	+2 per point	Catastrophic Crew Compartment Failure	+10
Weapon Accuracy Loss	+1 per point/weapon	Complete Structural Failure	+vehicle Size
Weapon Destroyed	+5	Auxiliary Systems Perk	+Perk cost

▣ REPAIR THRESHOLD

Damage Effect	Repair Threshold	Damage Effect	Repair Threshold
Armor Rating Loss	1 per point	Fire Control Destroyed	6
MP Loss	1+1 per MP	Power Transfer Failure	5
Maneuverability Loss	2+2 per point	Catastrophic Crew Compartment Failure	7
Weapon Accuracy Loss	2+1 per point/weapon	Complete Structural Failure	8
Weapon Destroyed	5	Auxiliary Systems Perk	3+ 10% of Perk cost (round down)

▼ EXTRAS

6.7.11

Extras are all those little features that make a vehicle so much more useful to its crew. These features have absolutely no tactical game effect, and so they do not modify the vehicle's Threat Value. They do, however, have a price tag attached. Their price is added to the vehicle's Pre-production Cost.

Access Lift: All vehicles are assumed to be equipped with some way to get aboard: handholds or footsteps, for example. An access lift is a bit better. It lifts the crew, passengers and any luggage to the crew area rapidly and in comfort. Its cost is 10 Cr per kilogram of lifting ability, up to a maximum of 1000 kg.

Cockpit Decorations: Furry dice, full color pin-ups, plastic dolls or good luck tokens — no matter how cheesy, you too can have one! Great for morale. Most trinkets cost about 2 Cr per item.

Funny Horn: Why be satisfied with the boring standard “honk” noise? Make your own customized horn to reflect your personality! This system emits one (or more) very loud noises from hidden speakers on the vehicle, for 50 Cr per sound.

Hi-Fi Stereo: Sure, you've got a multi-channel military communication array, but what good is it to listen to the latest neon rock CD? This audio system is fully digital and can serve as a passable radio receiver (-5 Comm) or play back standard datadisks. It also includes large speakers capable of high decibel output. All this for only 1000 Cr.

Plush Seat(s): To fight battles in the best comfort possible. A variety of different coverings is available in a wide range of color. The average cost is about 200 Cr per seat, depending on size and covering.

Refrigerator: A must for keeping your lunch cool for that after-battle rest. Also come in freezer variants, if you have a taste for ice cream. It costs 150 Cr per cubic foot of storage space (roughly 30x30x30 centimeters).

Security System: All vehicles are assumed to be at least equipped with a key lock on their starter. Even bicycles will come with a chain and padlock so you can secure them somewhere! Sometimes, however, a simple mechanical lock just won't do. Security systems prevent thieves (or disgruntled ex-lovers, or young siblings) from getting away with your precious machine. The rating of the system must be beaten with an Electronic skill roll, else the system doesn't allow access. On a fumble, the alarm goes off. The cost of the system is equal to its Rating squared, times 100 Cr.

Wet Bar: Perfect for celebrating your final victory. The wet bar contains several drinks, a water dispenser and an ice-maker to mix any cocktails you can imagine. The Wet Bar contains a number of liters of drink equal to its Rating, and as many different flavors as chosen. The cost of the bar is equal to its Rating squared, times 200 Cr.

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