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Traveller. [TRAV-uh-ler, TRAV-ler]. –noun. [Origin circa 1300, from the Middle English, *travaillour*, with connotations of toil, as in “to make a difficult journey”]. 1. One who travels, or who has traveled, or who will travel, as to distant places. 2. An adventurer. 3. The game of science-fiction adventure in the far future.

Deraabelar. [der-AAB-el-ur, de-RAAB-e-lur]. –noun. [Origin circa -2200, loan word from the Anglic, but with connotations of distance because of its similarity to the Vilani *rabelar*, far away]. 1. One who goes far away, or has gone far away and returned. 2. A rogue. 3. A popular Terran role-playing game transplanted to the worlds of the First Imperium.

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Core Rules

TRAVELLER[5]

Science-Fiction Adventure
In the Far Future

ROLE-PLAYING
FFE
GAMES

Previous Editions:

Classic Traveller (CT). The original edition of **Traveller** published by GDW, released in 1977, and revised in 1981. The core rulebooks were intended as generic science-fiction, and the development of the Third Imperium setting came through adventures and supplements.

MegaTraveller (MT). The second edition of Traveller published by GDW, released in 1987, introduced a unified task structure around a fully developed skill system, and advanced the Imperium setting into the Rebellion era.

Traveller: The New Era (TNE). The last edition of **Traveller,** published by GDW and released in 1993, changed the game mechanics to be compatible with the GDW "House System" of RPG rules. The setting is one of recovery after an interstellar collapse.

Marc Miller's Traveller (T4). Created as a successor to the GDW editions, published by Imperium Games and released in 1996, and rolling back the setting to the founding years of the Third Imperium.

This Edition:

Traveller5 is the fifth numbered edition of the **Traveller** science-fiction role-playing game and its associated publications.

Preliminary CD-ROM edition, Version 1.0.

TRAVELLER[5]

Science-Fiction Adventure
in the Far Future

FFE invites questions and comments on the preliminary edition. Please contact us at:

Far Future Enterprises
1418 N Clinton Blvd
Bloomington IL 61701

www.farfuture.net

Travel without companions is an empty journey.
My joy and satisfaction in writing and playing **Traveller**
would be empty without my faithful support and life's companion.

to Darlene

TRAVELLER[5]

Science-Fiction Adventure in the Far Future

Marc Miller

Robert Eaglestone Don McKinney

Hunter Gordon Bryan Gibson David Deitrick Darlene Miller

Don McKinney, Robert Eaglestone, Val J. Dauterive III, Andrew Boulton, Scott Martin,
David Smart, Greg Frantsen, Kurt Willer, Ron Brown, Chad Russell,
Jeff Zeitlin, Bill Cameron, L. M. Spitz, Ryan Fitch-Davis.

Loren Wiseman, John Harshman, Frank Chadwick, David Nilsen
Lester Smith, William H. Keith, Jr., J. Andrew Keith, Joe Fugate, Gary Thomas
William **Wilson**, Collin Krause, Sawyer Krause, Shane McLean, Liam Devlin.
Mike Wightman, Martin J. Dougherty, David Golden. Joseph Heck, Guy Garnett, Joshua Bell.
Gedeon Trias, Wolfgang Reich, Constantin Terton, James Kilbride, Ty Beard.
And an army of dedicated, helpful playtesters.

Contents

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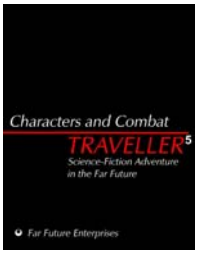
Characters And Combat



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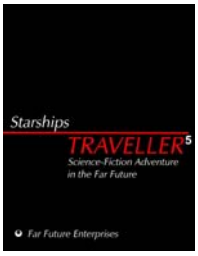
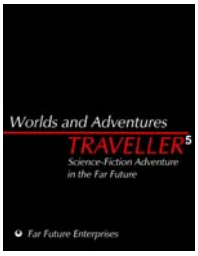




William H. Keith, jr

Absent Friends

The **Traveller** universe has been a community of friends since even before its first publication. **Traveller** players are a unique and diverse group who enjoy the opportunities the game provides them for camaraderie and imagination.

Lamentably, some of our friends are no longer with us, but their memory remains…

J. Andrew Keith
1958-1999

Andrew was a prolific science fiction and role-playing game author with **Traveller** clearly predominant in his writings. He was intelligent and creative in his writings and an asset to the **Traveller** system.

Clayton R. Bush
1958-2007

Clay was an independent author of convention scenarios in 'odd' systems, but he always returned to **Traveller**. In 1991, he received a *'Lifetime Achievement Award'* for writing and running over 100 convention events.

Don Rapp
1936-2007

Don caught the **Traveller** bug early and enjoyed promoting **Traveller** at conventions. He was the author of some of the first supplements to **Traveller**: *Scouts and Assassins*, and *SORAG*.

Bari Z. Stafford Sr.
1953-2002

Bari enjoyed designing ships, sectors, and situations for **Traveller**, and he enjoyed sharing them with fellow **Travellers**. His *magnum opus* was *Turokan's Expedition to the Rim*.

John M. Ford
1957-2006

John as an extraordinarily intelligent and witty man with exceptional writing talents on the larger science-fiction scene. He nonetheless lent his talents to gaming and to **Traveller**. He wrote GURPS **Traveller** *Starports* and was a frequent contributor to the Journal of the Travellers' Aid Society.

Paul Montgomery Crabaugh
d. 1985

Paul was an early asset to **Traveller**, and regrettably an early loss. Issue 51 (1982) alone of *Dragon* featured four of his articles on **Traveller**, each short, punchy, and insightful. He was also an advocate and a pioneer of the Civilian-- the career for players to experiment with being an average Joe.

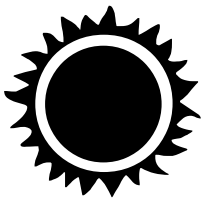
Robert E. "Bob" Bledsaw
1942-2008

Bob pioneered the licensed role-playing supplement with D&D materials, and expanded to produce **Traveller** materials in 1979. Notable among the items he published were *Starships and Spacecraft*, the **Traveller** *Judges Screen*, and *Dra'k'ne Station*.

E. Gary Gygax
1938-2008

All role-players owe a debt of gratitude to Gary Gygax. It was his pioneering of the recreational role-playing genre with *Dungeons & Dragons* that created the modern role-playing game. In the long view, he ranks with H.G. Wells (whose *Little Wars* pioneered military battle games) and Fred Jane (whose *Jane's Naval Wargame* pioneered sea battle games).

Dungeons & Dragons had a strong and lasting influence on **Traveller**.



The early editions of **Traveller** led RPG design with evolutions.

Classic Traveller was one of the first RPGs to abandon classes or levels. A character's experience was based on how old he was, and what career he pursued.

MegaTraveller added the task system: its flexibility and adaptability an inspiration to so many RPGs, with it's flexibility and adaptability.

But **Traveller: The New Era** had no evolutions – it was a conversion to a different game system. And when **T4** was released, there were too many compromises between the various editions. I have to confess: as with many fans, I stayed with **MegaTraveller** and its accompanying errata; others went back to **Classic Traveller**, and still others combined their favorite pieces from the various editions into their games.

The first discussions Marc and I had about a new **Traveller** edition were in 1997; he was cleaning up the **T4** mechanics at the time, and I wasn't interested. Over the next decade, many rumors came out about what Marc was working on, and every **Traveller** fan had their opinion of how he had to do it. I did keep an ear out on what might be changing, but nothing I saw changed my mind to keep my favorite edition.

Late in 2007, Marc passed me a new draft, and I saw something different. This was not a redone **T4**, not a cleaned up **MegaTraveller**, not even a revised **Classic** edition. This was an evolution. It was just notes on some careers, but I saw something there. So he invited me to join a group (the infamous "Sewing Circle") and he e-mailed us updates on an infrequent basis. My infrequent involvement shortly became deeper, and I found myself having more fun buried in **Traveller5** drafts than I had ever had before in gaming. From the early sewing circle discussions to the incredibly rewarding forum errata-fests, it's been an amazing experience watching these rules develop.

I encourage you to read through these rules several times. Let the overall concepts seep in. Then go through it again, and you'll see nuances you missed. **T5** is as much an evolution in some places as adding the task system was to **MegaTraveller**. In other places, it's even more. RPGs have evolved a lot since 1974 and 1977. Now **Traveller** finally catches up, and then jumps ahead.

Welcome to **T5**.

Don McKinney

Preface

This volume may seem daunting: hundreds of pages about the universe of the future. Where should you start? What material is new? What has changed?

This is a daunting volume, more than ten years (in some respects more than that) in the making. There was a point when the text flowed non-stop evening after evening almost directly into the original Little Black Books. The concepts that went into those three books have come back time and again, to be revised, expanded, and elaborated upon. A few words about mercenaries and the military became a major emphasis in **Traveller**; a few more worlds about space navies became another emphasis.

This text takes so many of the ideas from the original **Classic Traveller** and all that followed it, and brings them to maturity. It helps to point out some of the advances and details in this volume, rather than make you dig for them.

The Foundations

We lay out early many basic concepts that come back time and again.

The chapter on **Dice** provides the statistical expectations for die rolls: to help player make better choices. Then it defines the types of die rolls that will be used throughout these pages: rather than define them again and again as they come up. We introduce terms like Assets and Target Number and Mod and DM. We introduce standard rolls, and special purpose rolls, and a new one: Flux.

Standard Die Rolls
Standard Die Roll Terms
Probabilities of Die Rolls
Flux

We cover **Traveller's** traditional hexadecimal "use letters as numbers" concept now labeled **Ehex**.

Ehex

We define what a **ton** is (it's the volume of 1000 kilograms of liquid hydrogen) and how its used to measure cargo, and ship size, and more.

The Ton

We define the values for **Range Bands**: in fact, we define several different types of Range Bands for use on worlds, for use in space, for calculating altitudes, and even social distance (see the chart for Fame). Flyers can fly at specific altitudes; starships can skim gas giants at specific altitudes; submarines can dive to specific depths.

World Range Bands
Space Range Bands
Attitudes on Worlds
Depths of Oceans
The Depths of Gas Giants

We define what **money** is: the Credits that characters carry in their pockets; the MegaCredits that business and companies spends, and the Aryu that worlds use in their budgets.

Money
Credits, MegaCredits, and Aryu

We also define **Benchmarks** for money: how much a person needs to live on; how much a person can earn at various jobs; how much common items cost. We also address Benchmarks for Sizes: we discuss how big some things are, and then assign number values to them.

Benchmarks
Costs
Values
Sizes

The preliminaries define early in the text some very basic concepts that are helpful for players.

Characters

We took a careful look at the six personal characteristics and defined them in detail. Earlier **Traveller** aliens had alternative characteristics, and we have expanded that concept to include alternative or analog characteristics for some non-humans. We also defined two secret (or at least obscure) characteristics: Psi and Sanity.

Characteristics
Alternative Characteristics
Sanity
Psi

We considered a wide variety of career types and narrowed them down to 13: any other career is really just a subset or a specialization of these 13. We defined how to create homeworlds; what sorts of education are available; what benefits accrue when a character retires.

13 Basic Careers

Yet the basic concept of career resolution for characters remains: updated, refined, but still recognizable to veteran **Traveller** players.

We have added **Genetics**. A character can record genetic information during character generation, or discover it later through genetic testing. Genetics allows characters to establish a link with characters (ancestors, descendants) in other milieux. Genetics is also a basis for **Geneering**.

Genetics
Geneering

We provide detailed rules for **Clones**, including Life Insurance. We go beyond clones to address **Chimeras** and **Androids**.

Clones
Chimeras
Androids

We address (at length) **Sophonts**: aliens of all sorts and types, including the ability to create new sophonts (or import your favorites) with relative ease.

Sophonts

Basic System Mechanics

The central mechanics of **Traveller** remain the detailed task resolution system and its companion skill set. A defined set of skills is paired with an unlimited set of knowledges: characters can turn their attention to anything they want and find the task system supports them. We have implemented Talents: special abilities for non-humans.

Task Resolution
Skills
Knowledges
Talents

Some details may seem superficial: Birthdays, for example. But the character's birthday provides a recurring time for that character to evaluate experience and increase abilities.

Birthdays
Experience

We have defined how the senses work: a character can ask "Can I overhear that conversation?" or, "Can I see anyone through this haze?" and get a reasonable answer. We have defined two alien senses which non-humans may make use of. And having defined how the senses work, we have provided the ability to reasonably determine how binox and sound amplifiers work.

The Senses

We have defined a system for evaluating the **Quality** and performance of objects. Calling a rifle High Quality means something; saying a communicator is Easy-To-Use also means something. It's possible to find a device and find its dangerous to use, or buy a computer that is extremely reliable. The **QREBS** System (for Quality, Reliability Ease-of-Use, Bulk, and Safety) defines a range of characteristics for equipment.

Quality

The QREBS System

We have refined the Interpersonals from **MegaTraveller** into **Personals**: a system, for interaction with Non-Player Characters. Personals guide a Referee as he role-plays a Patron or a casual encounter.

Personals

Combat

The Traveller Combat System implements a two stage process of weapons attacking, penetrating armor, and finally inflicting wounds. The system is easy to use and provides detailed information about injuries to characters.

Personal Combat

We have implemented a wide range of weapon Effects: Acid, Burn, Hot, Cold, Electric Shock, Infection, as well as traditional Bullets.

Non-Bullet Weapon effects

In response to the weapon Effects, we have implemented protections which resist them: Insulation (protecting against Hot and Cold and Electric), Sealed Environments, SoundProof, RadProof, and more.

Non-Lethal Weapons

Effects which penetrate Protections inflict injuries on characters and damage to vehicles. Injuries produce reductions in Characteristics. Damage affects locations based on a Hit Location Chart. If the damage is not too severe, it can be repaired after the battle.

Armor and Protections

Injuries to Characters

Damage to Vehicles

Supporting the Combat system is a series of Makers:

GunMaker creates guns from small pistols to gatlings, each with its own special features. Many weapons are non-lethal; others are weapons of mass destruction. GunMaker includes a variety of options for weapons (folding stocks, special sights). Silencers are available (and the Sense rules make it harder to hear Silenced weapons).

GunMaker

ArmorMaker defines a variety of protections: filter masks and respirators, ballistic vests, and more. It also creates vacc suits and battle armor in a broad range of tech levels and armor levels. Some armor is traditional; others are small vehicles. Armor Maker also allows creation of Oversized and even Titan suits: for larger, non-human soldiers.

ArmorMaker

VehicleMaker creates a broad range of vehicles, customized for special purposes.

VehicleMaker

In many ways, **Traveller5** has abandoned the detailed piecemeal construction systems of **Fire Fusion and Steel**, and replaced it with the faster, easier, and often more satisfying, Maker systems.

Starships and Space Travel

We define Starports in detail.

Starports

We also define star travel in detail, including how Jump works.

How Jump Works

This volume includes ACS Adventure Class Starship Design and Construction. It covers ships from 100 to 2400 tons with an easy-to-use FillForm for recording the design process.

Ship Design 100 to 2400 tons

The design system integrates extensive coverage of Sensors, Weapons, and Defenses. The system allows one weapon as a MainWeapon; it includes turrets, barbettes, and bays. Some defenses operate in Absolute Mode against a specific weapon; some weapons can be deployed in a defensive Anti-Missile Mode.

Sensors
Weapons
Defenses
Armor

Armor can be installed in Layers.

A powerful Computer system produces networked computers on-board ships. integrated with Software and Computer Architecture that allows sophisticated computer operations and artificial intelligence.

Computers
Software
Computer Architecture

The system creates a powerful interaction between the design choices of the Naval Architect and the final values on the ShipSheet (the Ship Damage Sheet) used in Space Combat.

The Ship Design System also introduces the logical technological extensions of drives and power plants: Anti-Matter Plants and Energy Collectors, the Hop and Skip Drives, and NAFAL.

Advanced Drives
Advanced Power Plants

Space Combat

The Space Combat system produces a clearly defined procedure for resolving attacks.

Combat uses Range Bands with clear definition of what weapons can attack when. Missiles launched from far away attack in the next (or later) turn. Ships can ram targets. We have introduced Kinetic Kill Missiles, Nukes, Battery Fire, and allocation of some weapons to Anti-Missile Mode.

Ramming
Kinetic Kill Missiles
Nukes
Ortillery Bombardment

DataCasters can try to insert viruses in enemy ships. CommCasters can co-ordinate attacks by multiple ships. Ortillery can bombard worlds.

Space Combat normally hits specific parts of ships: a turret, the drives, the bridge. But some hits (if big enough) can blow a ship up.

Hit Locations
Critical Hits

Charted Space: Within and Beyond

We define Charted Space: the miniscule portion of the Galaxy inhabited by humans and other races. We also give a glimpse of what lies beyond the boundaries of Charted Space.

Sector Mapping
Subsector Mapping

We detail interstellar mapping on a Sector and Subsector basis.

World and System Creation

Then we move into a rational star system and world creation system based on Classic Traveller. It covers creating one or more stars and then a mainworld. Other worlds are created as necessary.

The MOARN Concept

We introduce the concept of **MOARN** Map Only As Really Necessary; detailed systems are necessary only as they are visited or explored. But let's look at what is possible. Worlds have the traditional UWP. New provisions allow for occasional world sizes and occasional world populations above 10 (to as high as 15). There are a variety of new trade classifications (which have extensive effects throughout the entire game system).

World Size to 15
Population to 15

We introduce three "Extensions" of additional information about Worlds: Importance (ranking worlds in a region and governing the designation of the Capital and placement of Trade Routes), Economic (providing insights in the world's budget), and Cultural (providing insights into social behaviors).

The Importance Extension
The Economic Extension
The Cultural Extension

The old tradition of Starport X for Red Zones has been displaced by Trade Classifications; Starport X simply means "No Known Starport."

Multiple Stars in a System

A system can have as many as eight stars, although that many is very rare. Many systems do have multiple stars: some are near companions; some systems essentially have two or three systems crammed into a stellar hex.

Multiple Systems within a System

The other worlds in a system have more flavor: IceWorlds, RadWorlds, Infernos, Stormworlds, and more.

IceWorlds
RadWorlds
Infernos

Gas Giants are differentiated into Small and Large, with the addition of Ice Giants. There is also the occasional Brown Dwarf.

The Star System is broken into the Inner System (Orbits 0 to 5), the Outer System (Orbits 6 to 12), and the Remote System (Orbits 13 to 19). Graphic charts show the location of the Habitable Zones for the placement of Mainworlds. An M9 II has a Habitable Zone at Orbit-11 (21 light-hours out).

Inner, Outer, and Remote Systems.

Easy to use graphic FillForms record the worlds in a system.

Terrain and Mapping

We define world terrain (for habitable and inhospitable worlds) and its effect on vehicle movement. Charts define altitudes for use by Flyers, and depths for use by submersibles.

Defined Terrain

World maps have been standardized on 1000 km hexes; the standard geodesic world map changes in number of hexes based on world size.

Standard World Maps

Sample blank world maps are provided for all sizes from 1 to 15.

Blank Maps

World Hexes have a hierarchy: World Hexes contain many Terrain Hexes, which contain many Local Hexes, which contain many Single hexes. It is possible to map a world down to 1 km hexes.

Technology

While based on traditional technology levels in **Traveller**, the Technology chapter defines all possible tech levels, including the theoretical maximum Tech Level (Z) and its repercussions on the universe in general.

All Tech Levels Defined

The Technology chapter also details creating objects at higher than their normal TL (as Improved or Advanced devices) or lower (as Prototypes or Experimental). Tech Level for objects becomes a range rather than a point on a scale.

Experimental Devices

Advanced Technology is defined and used consistently in this edition to a far greater degree than ever before.

Advanced Devices

Trade And Commerce

We define a trade system with hundreds of differentiated goods and how they are priced for buyers and sellers.

Hundreds of Trade Goods

Psionics

The entire Psionics system has been rationalized and defined to make it useful and usable (for those who dare pursue its secrets). Psionic Senses mimic the real senses; Psionic Actions are clearly defined.

Psionic Senses
Psionic Actions

Sophonts

Our extensive sophont creation system produces detailed non-humans: some are very near human; others are strange and fantastic. The range from small intelligent creatures to huge lumbering but intelligent beasts. Their many differences present intriguing challenges to players who take them on as characters.

Complete Alien Creation

There is, of course, much more than this short overview…

Traveller Is About Travel

Most people never venture beyond the familiar boundaries of their village: they live their lives close to home. They pursue honorable goals; they raise families; they sustain the fabric of society and economy that drives civilization. But they also fade into obscurity.

Adventure comes only to the bold: to those who move, who travel, who act.

Traveller is about travel.

"For my part, I travel not to go anywhere, but to go. I travel for travel's sake. The great affair is to move."

Robert Louis Stevenson

Players want to know about the universe… about other worlds and other cultures, about space travel and aliens, about fantastic technology and incredible science.

Traveller gives player the opportunity to fulfil that quest.

Traveller is about the human condition.

"We travel to try to outrun death, attempting to see all of the sights creation has to offer before the day comes that we can see no more."

Clif

Players encounter strange worlds, alien races, and exotic cultures, but they always see them through human eyes.

Aliens so random, so incomprehensible, or so illogical that players cannot understand them serve no useful purpose.

On the other hand, many alien cultures are puzzles: careful attention slowly reveals the underlying logic of their behavior and their values. Well-thought-out alien cultures stimulate thought and, ultimately, promote understanding. A warrior race makes us think about violence and how we perceive it. A world that prohibits music forces us to examine the value of music in our own society.

Traveller is a journey of understanding about what it means to be human.

Traveller is about consequences.

We set out to rule the world!
Maybe I'm dreaming, but I don't care
Because whether I'm asleep or awake,
doing good is what matters.
When I'm awake, for its own sake
if not, to win friends for when we awake.

Pedro Calderón de la Barca,
La Vida Es Sueño

Everything we do has consequences: kindness is repaid at some other place and some other time; malice triggers consequences years later.

The fact that acts have consequences strongly influences (or should strongly influence) the decisions every role-player makes.

Traveller is about danger.

In those times it was not safe for anyone to go or come, for great disturbances afflicted all the inhabitants of the lands.

2 Chronicles 15:5 (NRSV)

Travel without danger is mere tourism: it's no more than casual viewing of interesting locations.

The element of danger is what transforms travel into adventure.

Traveller is about risk and reward.

"Shall we rise again to be lords of space and the rangers of the star lanes?" he wondered. "Do we begin this day a second cycle leading to another empire?"

He was a little startled when Zicti's thought answered his. "It is just history, my boy, history. We fashion that whether or no. But there is a very old saying known to my people--- 'When a man comes to the end of any road let him remember that the end is not yet and a new way shall open for him.' "

Kartr turned his back upon the Hall of Leave-Taking and ran lightly down the eroded steps. The wind was chill but the sun was warm. Dust puffed up from beneath the marching feet.

"Yes, the end is not yet! Let us go!"

Andre Norton,
Star Rangers

Gains by chance are no more than lottery prizes; true rewards come when players make plans, take risks, and act boldly in pursuit of their goals.

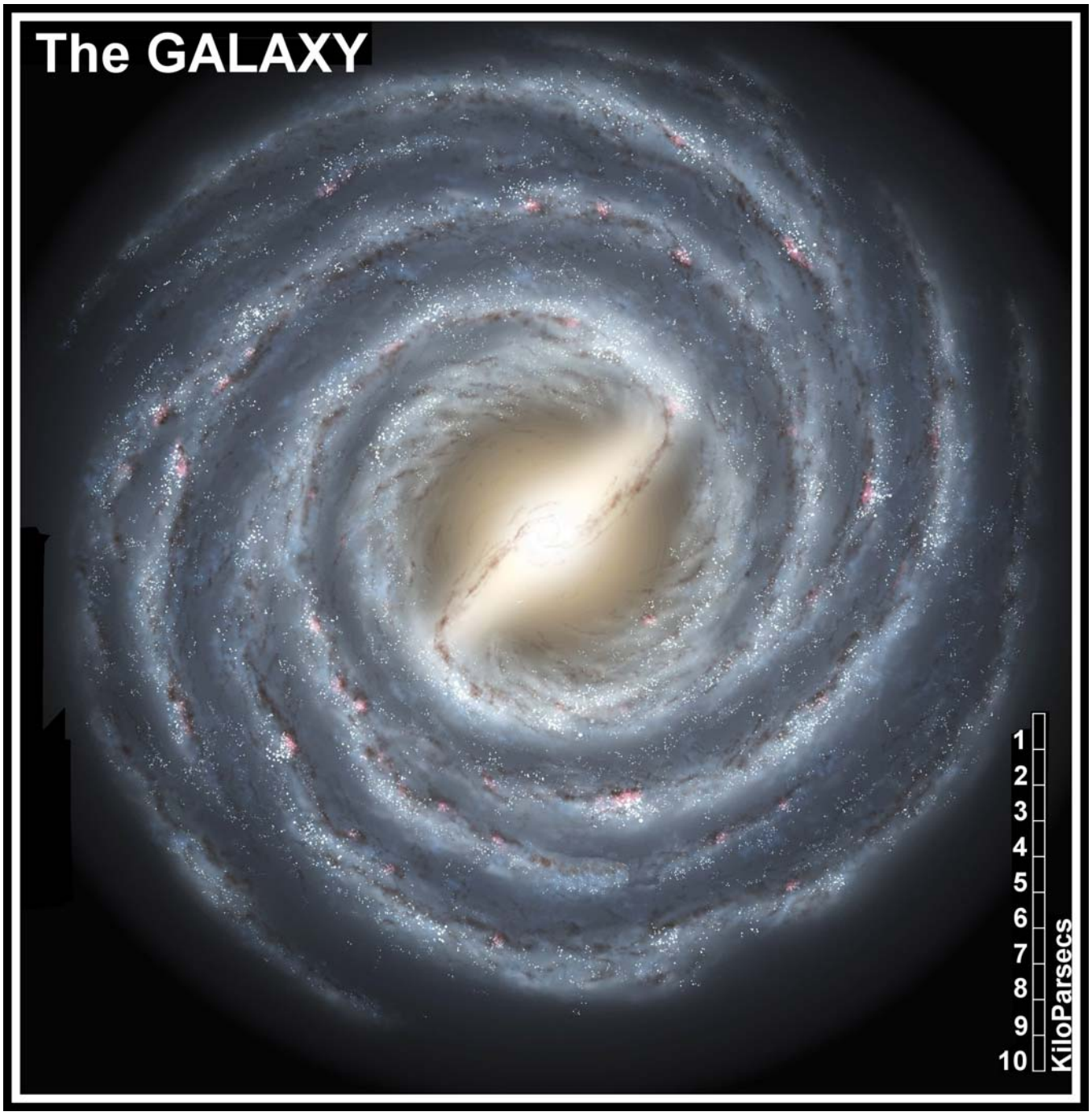
And so, Traveller is ultimately about goals.

Even though eternity lies before us,
this is the life in which
the work of this life is to be done.
The life that lies beyond will have
its own work to do,
its own decisions to be made,
its own distance to be travelled.

Richard L. Evans,
The Spoken Word

Some people want to build empires. Some care about money, others about power, still others about knowledge. Each player is different: each sets his own goals and his own pace. And so, ultimately…

Travel (and **Traveller**) is a process, not a goal.



The Galaxy (also **Our Galaxy**, the **Milky Way Galaxy**, **Galaxias**, or **Dakhaseri**[1]) is the barred spiral galaxy which is home to Humanity. It is 30 kiloparsecs in diameter, approximately 3 kiloparsecs thick at its center, and contains an estimated 200 billion to 400 billion star systems.

The Galaxy is almost as old as the universe: its oldest stars date mere millions of years after the beginning of time. The majority of its stars, however, are between 6 and 10 billion years old.

The Galaxy has held life from its earliest moments. There is evidence that even the earliest stars had planets and that those planets generated the primordial soups that breed life. Wherever life can appear, it does appear.

[1] **Dakhaseri.** Literally, Audience of Stars. There is an ancient Vilani story of meritorious souls being allowed to watch the events of the world.

A Brief History of the Universe

The universe teems with life: everywhere, worlds coalesce from gas and stardust; everywhere, life begins; everywhere, life evolves toward intelligence. On some of those worlds, intelligence reaches for the stars, and on some of those worlds, intelligence succeeds.

The history of the universe is the history of the exploits of many different intelligent species and their interactions (a euphemism for expansion, aggression, and conflict) with other intelligent species.

This history is divided broadly into **milieux** (the singular is milieu) or **eras** dominated by a few intelligent species and a few important controlling facts. Each milieu is focused on some specific step in the progress (or sometimes the decline) of interstellar civilization. And each milieu has a long-lasting and profound influence on future generations.

LONG AGO

Intelligence does not guarantee success. For eons, worlds evolved intelligent life, and each of these sophont[1] species lived and died without ever leaving its home system.

Eventually, some sophonts reached beyond their system to the nearest stars. Some established colonies on other worlds; some tried to explore the universe with generation ships. But all were restricted by their NAFAL[2] technology ships, and even long-lived races found the speed limits of the universe frustrating.

The Grandfather Era (300,000 BC)

The universe as we know it was irrevocably changed by a meek, even dull, pastoral intelligent race (the Droyne) which thrived some 200 parsecs from Earth in the long ago past.

Droyne society prospered at a comfortable, if not very high, technology level. They expanded to settle their homeworld and then achieved a plateau of civilization and of progress. Their society remained static (but reasonably happy) for thousands of years.

Then, some 300,000 years ago, one of the newborn Droyne was different… a mutation, incredibly intelligent, incredibly talented, and incredibly ambitious. In his early adulthood, he realized the full power of his talents and used them to conquer his world and his people (not that either really resisted). This super-genius (called Grandfather by modern anthropologists; they call this genius race the Ancients) then turned his attention to space, inventing powerful space ships and then even more powerful starships with jump drive.

He and his people ventured boldly out into the universe. He raised a family of super-genius children (nearly as smart as he) and they flew in many different directions to settle hundreds, even thousands, of worlds. Each of his children focused his genius on conquering some aspect of the universe.

One discovered a means of controlling stellar evolution; another invented a series of custom crafted elementary particles. Some of their discoveries and inventions had practical uses; others were mere curiosities.

Back on the homeworld, Grandfather invented immortality (for himself only it seems; he shared a lesser form of it with his children). He invented new energy sources, world shattering weapons, mind-boggling transportation systems, and pocket universes. He found an exploited loopholes in the laws governing the universe. Much of what he invented is still unattainable to modern man.

At some point, he and his children had a disagreement. It escalated into a galaxy-wide war that completely destroyed their civilization and their thousands of cities on thousands of worlds. The modern universe can see evidence of this Ancient War: worlds with poison atmospheres, worlds scrubbed clean of life and cratered by asteroid bombardments; worlds with ruined cities littered with high-tech devices that no longer work (that still perform incomprehensible functions).

But there is another, less obvious, far more important reminder of the Ancients. At some time in their travels, the Grandfather's children (or perhaps Grandfather himself) visited Earth and carried away several thousand near-intelligent cavemen. They must have been useful in some obscure way because these humans were transported to hundreds of worlds.

At the end of the Ancient War, their worlds lay in ruins, but their humans lived on. Each of those planets became a new world which humans conquered and on which they created a unique yet human culture. Today, humans inhabit many of the worlds of Charted Space[3].

The False Dawn (200,000 BC)

There was a point in time, after the Ancients, before the rise of Humaniti, when at least one other intelligent race rose to technological power, reached the stars, and then faded to obscurity.

From an undetermined homeworld somewhere in or near the Third Imperium, these sophonts reached out and settled approximately five thousand worlds (one world in four sectors over a region more than 3000 parsecs in diameter).[4]

Over the next 200,000 years the many worlds of the

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[1] **Sophont.** An intelligent species. The term covers all intelligent species (including Humans). Alien covers all intelligent species except Humans.

[2] **NAFAL.** Not As Fast As Light. Contrast with FTL Faster Than Light.

[3] **Charted Space.** A small part of one spiral arm of the Galaxy inhabited by humans (and others) and dominated by the Third Imperium.

[4] These distances imply a 10,000 year journey from their homeworld to the farthest settled worlds. The NAFAL drives they used are mentioned (ambiguously) in their myths.

Kursae followed a common path: a downward spiral into a comfortable low tech, where they are today… sharing a common heritage of myths about their past.

The Vilani Era (9200 BC to 2300 AD

The first of the human races to reach many stars was the Vilani. About 9,200 BC, they invented (discovered? stumbled upon?) the Jump Drive: the key to FTL. They kept their technology secret, and used it to create a star-spanning empire. Its 7000 year reign can be divided into three periods:

The Early Empire (about 9200 BC to about 5400 BC). With a monopoly on FTL, the Vilani dominated both human and non-human cultures for dozens of light years around. The Early Empire was a time of expansion and easy domination.

Consolidation (about 5400 BC to about 4400 BC). As other cultures achieved higher tech levels they began to compete with the Vilani, and to resist their domination. The Vilani reaction was a series of Consolidation Wars which forcibly absorbed many worlds into the Empire.

Rigid Culture (about 4400 BC to 2300 AD). With Consolidation complete, Vilani society became a rigid, brittle culture dedicated to maintaining the status quo. Laws, politics, social pressure all emphasized conformity and resistance to change. Innovation and technological change were prohibited. Their four thousand year empire was drawing to an end.

First Contact (2000 to 2100)

In the 21st century, Terrans achieved interplanetary travel and by late century they had established bases throughout the solar system. About 2100, Earth invented the jump drive and reached the stars, only to find them already taken.

The Interstellar Wars (2100 to 2300 AD)

Fortunately for tiny Earth, the vast Vilani Empire ignored the Terran upstarts long enough for them to gain a foothold among the stars. Over the course of 200 years, the Vilani and the Terrans fought a dozen interstellar wars, each one seemingly inconclusive, but each one edging the Vilani Empire closer to collapse. In 2299, the Vilani were defeated so soundly that they surrendered.

The Rule of Man (2300 to 2750 AD)

Terra, with perhaps a hundred worlds in its confederation, now faced the formidable task of ruling, as a conquered territory, the now collapsed Ziru Sirka, with 11,000 worlds. Terra created the Rule of Man: the Second Imperium, to govern the conquered worlds, often assigning mere lieutenants as governors of worlds, and naval captains to rule subsectors of 30-40 worlds.

The valiant effort was doomed from the start. Nothing, not technological innovation, not social change, not new blood, not threat of outside invasion, was sufficient to raise the former Vilani worlds from their cultural lethargy. Over the next 400 years, the worlds of the Rule of Man drifted deeper and deeper into a dark age.

The Long Night (2750 AD to 4550 AD)

When interstellar trade shut down, the Rule of Man collaped as an interstellar government. Each world found itself on its own, living or dying on its own resources. Outpost worlds dependent on food or supplies simply died. Scattered starship trade kept other worlds alive, but after a few centuries, even the starships stopped running. Each world found itself alone in the sea of space, completely dependent on its own resources.

The Third Imperium (4521 AD to 5637 AD)

One world tenuously held on to its technology, its resources, and its knowledge, remaining a beacon of hope throughout the Long Night. Sylea began its own reconquest of the worlds of the former empire under the Starburst Banner of the Third Imperium. From a base of a dozen worlds, the forces of the Third Imperium began a systematic effort to recontact the 10,000 worlds of the old Ziru Sirka and bring them under one rule. Some accepted immediately; others hesitated, but none could resist the combined military might and economic incentives that the Imperium could offer.

The Imperium grew, and prospered. It expanded to rule thousands of worlds and dominate its neighbors, with trade if possible, with force if necessary. The Imperium's persistent expansion made it the central force to be reckoned with. Over the course of a thousand years, the Imperium grew to include most of the former First Imperium, plus other neighboring regions.

Ultimately, the Third Imperium reached its pinnacle of achievement: the Imperial Golden Age (1000 to 1116) of relative peace and great prosperity.

THE IMPORTANT ERAS IN HISTORY

Era	Important Players	typical date	Note
Grandfather's Children	Droyne	300,000 BC	
The False Dawn	Kursae	200,000 BC	
Ziru Sirka	Vilani	1500 AD	
First Contact	Terrans, Vilani	2100 AD	
Interstellar Wars	Terrans, Vilani	2200 AD	
The Rule of Man	Terrans, Vilani	2500 AD	
The Long Night	- -	3500 AD	
Early Imperium	Syleans	4500 AD	4
Aslan Border Wars.	Aslan, Imperial	4800 AD	
Vargr Campaigns	Vargr, Imperial	4850 AD	
The Barracks Emperors	Imperials	5100 AD	
Psionic Suppressions	Imperials, Zhodani	5300 AD	
The Golden Age	Imperial	5600 AD	1
The Rebellion	Imperials	5636 AD	2
Virus Era	-	5640 AD	3
The New Era	-	5700 AD	3
The Far Far Future	-	7500 AD	

This list is not comprehensive.

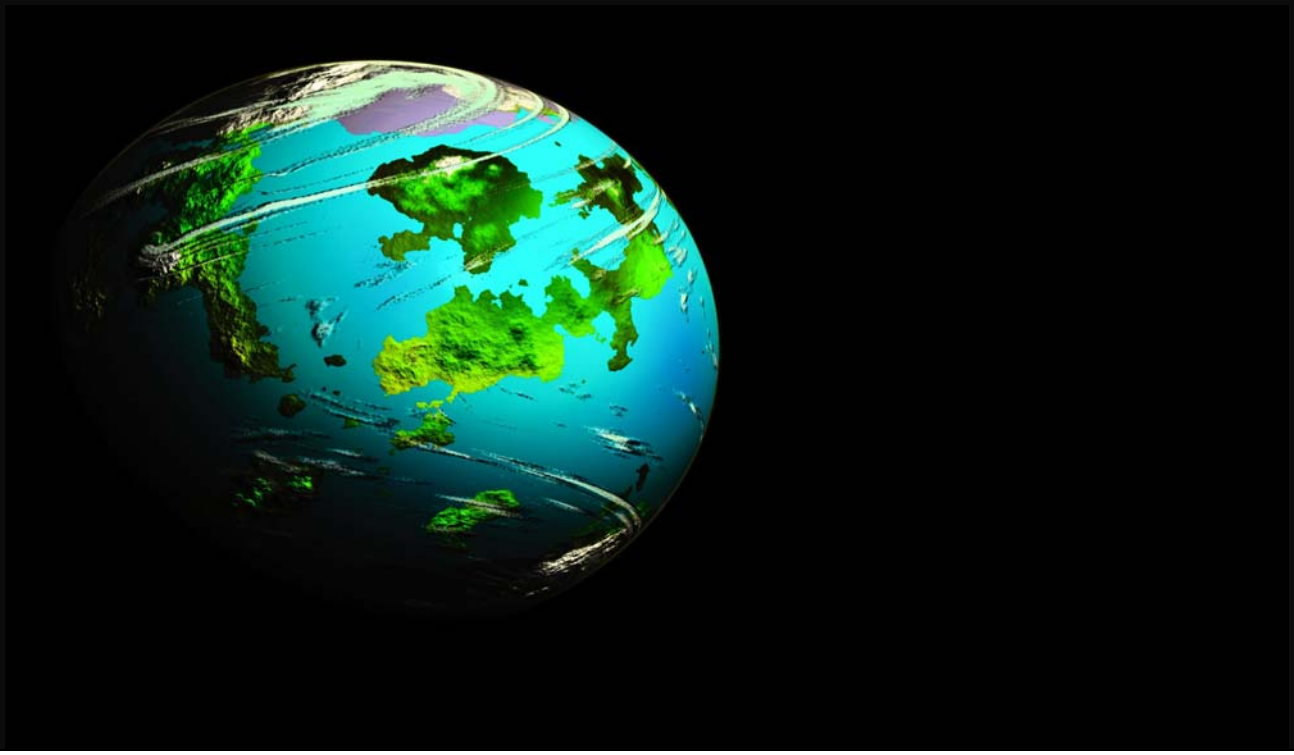
Notes

1. As chronicled in **Classic Traveller.**
2. As chronicled in **MegaTraveller.**
3. As chronicled in **The New Era.**
4. As chronicled in **T4.**

Dates shown are Earth-centric; local dates and calendars may vary.

Important players are the major races which participate and shape events in the era.

How The Universe Works



1 Communication is limited to the speed of transportation.

2 It takes about a week to travel between two neighboring stars.

3 Society is ruled by persons, not laws; honor is of supreme importance.

4 Everything is driven by economics.

5 There is no Prime Directive.

Valuable Benefits for Traders' Guild Members:

The Trade Route Data Pool
Discounted Life Insurance Program
Up-To-Date World Reports
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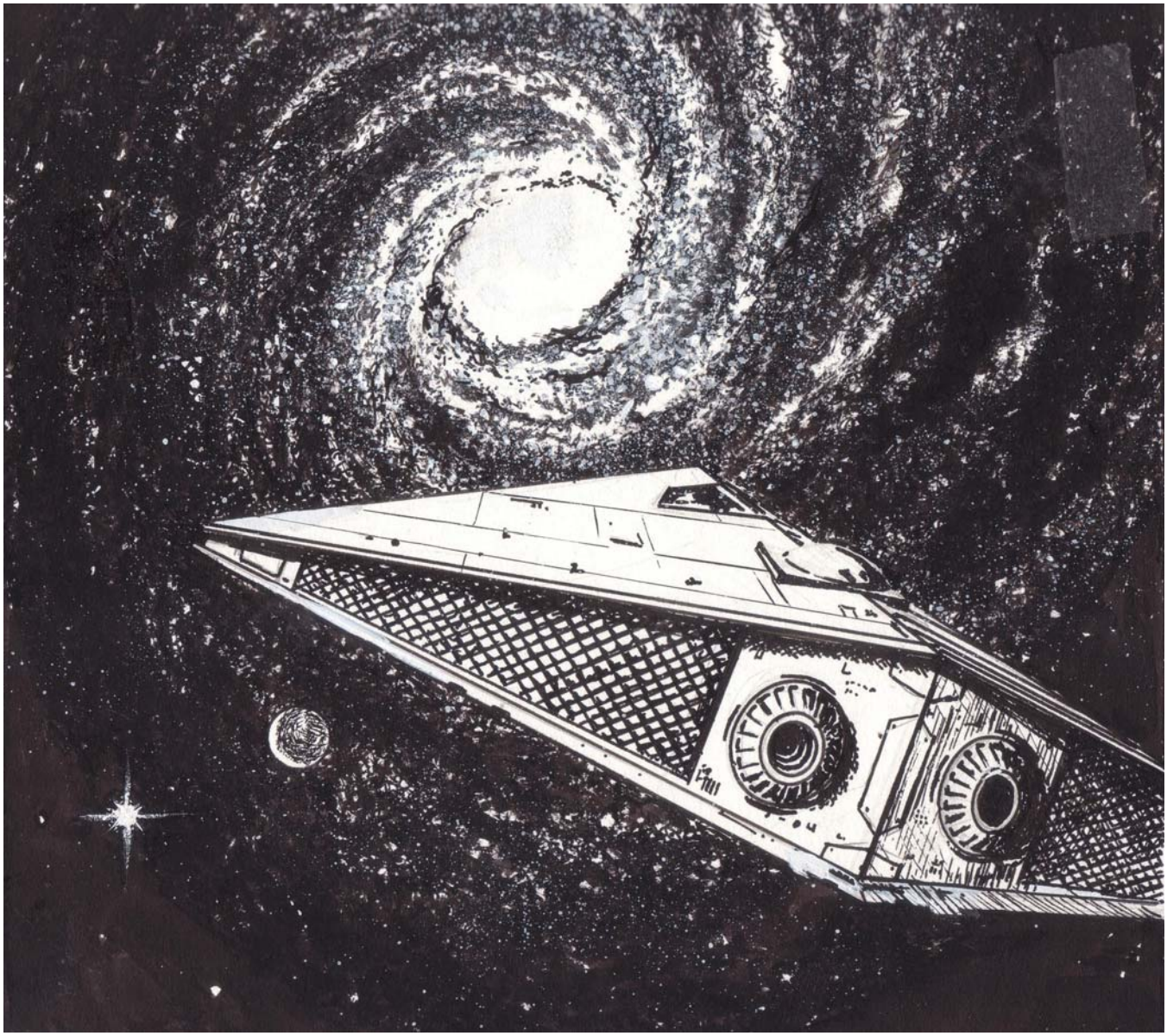
The Foundations of the Traveller Universe

Traveller is a comprehensive science-fiction system spanning a major portion of the galaxy and reaching far into the future and far into the past. Fundamental to the **Traveller** science-fiction game system are answers to myriad questions about life, society, civilization in the universe. Yet everything is part of a cohesive structure that gradually unveils itself… to the participants and to observers (whether they are readers, viewers, or players).

Traveller describes a vast future universe in which mankind has already reached the stars and conquered thousands of worlds, but still faces the never-ending struggle to conquer more worlds and wrest more secrets from the universe.

Based On A Role-Playing Game. The basis for all of **Traveller** is a science-fiction role-playing game which details the fundamental principles of the universe… how people interact, how starships fly, how guns work, how business operates, how worlds are defined. Using those principles, any activity is possible, and players attempt most of them. Over time, the adventures of players and the ideas of writers has helped to create the future **Traveller** universe.



FOUNDED ON BOTH HARD AND SOFT SCIENCE

Traveller is founded on the sciences: technological science and social science. Each adds realism to the system's universe while enhancing its adventure potential.

Technological Science Provides A Foundation

The technological basis for **Traveller** provides a common ground from which all extrapolations and story ideas can spring.

The Jump Drive. The secret of interstellar travel is the jump drive. While in normal space, travel is limited to the speed of light (and it takes years to go from one star to another), jump drive leaps around space: a jump covers one parsec (3.26 light years; the average distance between stars) in about a week. Improved ships can reach speeds of more than 1,000 times the speed of light.

Jump Drive is a foundation that makes interstellar travel easy to accomplish and easy to understand. Behind the future technology is a basic idea that can be conveyed visually or through simple conversations between crewmembers.

Communication Limited To The Speed Of Transportation. The universe is so vast that even the mega-speeds of jump drive can't work miracles. No one has yet (or ever will) invented a hyper-communicator that will send messages faster than light -speed. Communication is limited to the speed of transportation; a message to the edge of the empire needs to be carried there. For an empire 300 parsecs to the border that message takes more than a year to deliver, even under the best of circumstances. News of war, conflict, invasion, disaster, or even peace takes just as long to get back to the center of government.

Consequently the folks governing "out there" have a lot of independence. A war can be over before the news of it reaches the Capital--and orders return--so, Dukes and Archdukes have to act on their own. Commanders of ships (exploring or warring) have a lot of independence as well. The characters have to think on their own--if they work for a merchant company, opening new markets, they can't "phone home" every time negotiations break down--and on the other hand, the company needs to accept all sorts of wacky contracts and situations!

Restricted communication speeds mean that characters at great distance from their bosses are free to act as they wish. Characters without the restrictions of bosses are also thrown on their own initiative.

A Spectrum of Available Technology. Technology is not evenly distributed throughout the universe; instead, world and cultures can be classified by their achieved technology level.

The technology available includes alternatives to traditional or normally expected technology, but radical deviations from "normal" technology are rare and unusual encounters.

Yet primitive technology has its place: backwaters off the main routes are often content with their own levels of technology.

Allowing for different levels of technology permits players many different alternatives in how they approach situations.

Gravity Manipulation. The advance of technology has resulted in practical methods of gravity manipulation. Gravity manipulation expresses itself in four ways: as artificial gravity, as inertial dampers, as lifters, and as maneuver drives. **Artificial gravity** is built into the deck plates of starships; ship environments are similar to planetary surfaces. **Inertial dampers** eliminate the extremes of inertia which can pull and push people and equipment as a ship maneuvers. Although such dampers are imperfect, they do allow a normal environment on starships as they maneuver, and they allow extreme physical maneuvers on small craft as they perform high-G maneuvers. A range of gravity-based drives move ships round in a star system: **Lifters** negate gravity and let ships (and other vehicles) to move more easily near world surfaces. Lifters operate effectively only near large masses. They are ineffective (and aren't really needed anyway) in deep space. Finally, gravitic technology is the foundation for Gravitic Drives, Maneuver Drives, and even NAFAL: the systems that carry ships between worlds in a star system.

Grav Plates, Inertial Compensators, Lifters, and various Drives are included because they make it easier for players to conceptualize the actions of their characters, and because dramatic renderings of actions are realistic if they simply show people standing up.

Fusion Power. Cheap fusion power means that the inhabitants of this universe are not tied to gas stations or complex fuel systems. Hydrogen from water, ice, even the atmospheres of gas giants (like Jupiter) is all that is required to produce abundant electricity. Once a culture rises to the minimum required tech level, its cities depend on electricity produced by efficient, pollution-free fusion power. Starships draw their fuel from the worlds they visit.

Cheap fusion power simplifies adventuring by eliminating the need for routine refuelling on world surfaces. At the same time, the concept allows fueling requirements to be inserted where they add to the adventure situation.

Artificial People. A natural result of technology is the ability to create artificial people: clones, chimeras, synthetics (androids, sophontoids), robots, even raw personalities in computers. Non-anthropomorphic robots (robots not in the shape of people) are common place at the higher technological levels, although they are also effectively invisible… they fade into the background. People-like robots appear at the upper limits of technology and are always imitations; they may be superior in one or more areas, but they all lack a common feature… initiative. Robots are unable to act with clear initiative in unfamiliar situations.

Although robots are possible and present, they are not an overwhelming influence (or they are, if the referee and the players want to interact with them).

Social Science Adds Character And Flavor

The social sciences add their own flavor to the universe and impact many activities. Psychology supports the role and skill of counsellor; psychohistory adds the potential for large-scale manipulations of society; archeology helps understand the relicts of the past; and sophontology helps understand the intelligent beings of society.

A Cosmopolitan Universe. Traveller is a diverse, heterogeneous universe composed of many different factions, concepts, races, communities, and individuals. People (and the term is used to refer to "beings") come in many different forms, all of whom constantly interact as a

matter of course. Unless local circumstances require a homogeneous local population, travellers will continually encounter local populations which reflect diversity in terms of age, gender, and race. Even apparently homogeneous groups will reflect (upon examination) more diversity than expected.

Naturally, there is conflict, antagonism, friction, and strife between various groups, but the universe itself allows any individuals with talent to rise to the top of their field.

Traveller accepts diversity and allows (even requires) a wide variety of beings to interact for their mutual benefit. Such a universe is richer than a purely human environment.

A Human-Dominated Universe. Through a combination of fortuitous accident and strong-willed effort, humanity has reached a position of dominance in the universe. Three distinct groups of humans (the Vilani, the Solomani, and the Zhodani) have each created empires that span thousands of stars and trillions of citizens. In addition, more than a hundred additional human societies are scattered among the stars; each is, in its own way, a commentary on the strengths and the particular weaknesses of the human condition.

Although the universe is cosmopolitan, it is human dominated primarily in order to retain an element of familiarity for the players.

Duty, Honor, and Loyalty. Interstellar society naturally values people (human or not) on whom it can depend: those who are loyal and who faithfully do their duty are the ones to whom society awards responsibility. A natural nobility arises of those leaders of society who faithfully and with innovation follow the orders of their superiors. At the same time, superiors have learned to express their orders in the most general of terms: to give greater freedom of action.

People with responsibilities are expected to act responsibly. If they do not, they won't hold their positions for long.

There Is No "*Prime Directive.*" Interstellar governments have never felt it their duty to impede development, especially economic development. No government has ever promulgated the "*Prime Directive*" (that undeveloped cultures and societies be allowed to develop without interference until they can enter the community of interstellar civilizations). Instead, economic forces have driven the development of those worlds rich in natural or exploitable resources, and have retarded the development of worlds without resources.

Players are not hampered by artificial rules restricting what they can and cannot do.

Everything Is Driven By Economics. Economics is not strictly the study of finance; it is the study of making choices from limited possibilities. Regardless of the pronouncements of political, moral, or cultural leaders, action in this universe takes place because it will produce some economic advantage. Economic advantage generally means rewards in a monetary sense, but it can also mean rewards in political or social power.

But at the foundation of all action is lies some economic motive.

Players can understand what happens in **Traveller** because it is driven by the same elements that drive all human (or sophont) endeavor: economics.

Alternatives To Capitalism. Between worlds, trade is governed by pure economics and by capitalism. Regionally, governments may impose laws (essentially uniform business codes) which allows everyone to interact using the same rules. On some worlds, special economic systems may be adopted by the local governments.

Even alternatives to free market economics are possible.

Wheels Within Wheels. The quest for meaning is always fruitful in the **Traveller** universe. Events, ideas, concepts, and beliefs are shaped by environments, but they are also shaped by the thinkers themselves. And as those thinkers (readers, players, or viewers) learn and mature, they begin to have new insights into their beliefs. For example, the casual player knows the Imperial beliefs about the Zhodani (that they are an evil empire intent on destroying the Imperium). Over time, some players may see these Zhodani as humans with families, goals and desires just like other humans. With time, some players may see some Zhodani as inherently good. And over time is it possible to see that some Zhodani are still evil. In the **Traveller** system, **Wheels within Wheels** constantly shows new ideas and new facets of old ideas to the participants.

Crucial to the **Traveller** adventure concept is the idea that the rationale behind events or situations has a surface explanation, but when examined fully there are often deeper explanations which in turn give a greater understanding of how the universe works.

ADVENTURE!

Above all, this universe is filled with *adventure*. Individuals can own starships and travel on their own to distant worlds. Individuals can undertake literally world-shattering missions whose results depend on their personal courage and resources. Individuals are the key to discovery, progress, and the turning points in history.

The **Traveller** system addresses adventure through three specific areas:

Casual Players

Any role-player can play **Traveller**. The concepts are intuitive: travel, exploration, interaction, negotiation, combat, and all kinds of tasks. Individuals can role-play diverse characters or they can play themselves.

Casual players can be so casual that they know nothing about the game system at all, leaving it to the referee to handle the details.

Detailed Role-Players

Traveller provides dedicated gamers the opportunity to role-play complex characters with strong motivations and intricate backgrounds. The **Traveller** system can be as casual or as rich as the participants want it to be.

Systems Engineers

The **Traveller** system provides referees and game masters the materials with which to explore the **Traveller** universe in

detail. Starship design systems, world generation systems, vehicle description systems, trade and commerce systems, and encounter systems. Each is produced with two specific goals in mind: as a prod to the imagination, and to allow game masters opportunities to create custom equipment or information.

CHARACTERS

The central focus of **Traveller** is its vast array of characters. While every person in this universe of the future is a potential character to be played by a participant, **Traveller** concentrates on the exciting potential of explorers, powerful negotiators, military leaders, and intelligent academics. Each player assumes the alter ego of one or more characters and it is through these characters that the adventures of **Traveller** are played out.

Characters naturally follow a progression as the players behind them grow in knowledge and sophistication.

Money

At the elementary level, characters (and their players) are interested in economic benefits and in the adventures and means that bring them money and equipment.

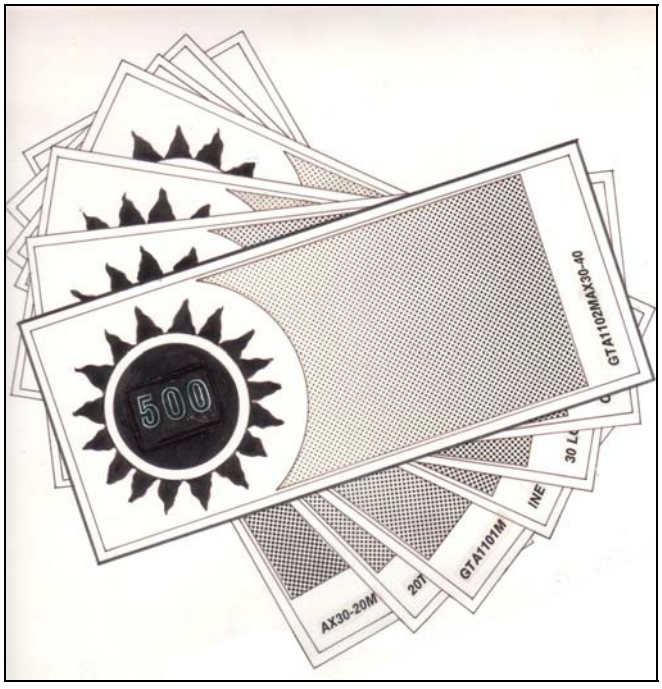
Power

Once a certain level of economic independence is reached and money declines in importance as a personal goal, the individual characters tend to focus on power and the means of achieving power. Power is expressed in many different ways: corporate power, political power, reputation.

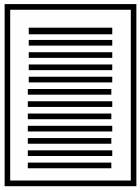
Understanding

Once a certain level of power has been achieved, the individual characters move on to the next step of personal development: understanding the many aspects of the universe that surrounds them. Again, **Traveller** satisfies this goal with its rich, varied universe filled with information and the potential for discovery.

Ultimately, the player behind the character reaches the next level of achievement within the **Traveller** universe: he or she becomes a referee devoted to administering the **Traveller** universe for other players.



Dice Results Are Random But Understandable



Playing **Traveller** is a continuing process of decision making. **Traveller** provides rules for manipulating the universe of the future through a variety of activities: tasks, personal combat, and character generation. Just as people make decisions based on the information they have and then see what happens, players in **Traveller** make decisions based on the game information they have and then see what happens.

To make the results of player decisions unpredictable but understandable, **Traveller** uses dice to produce random numbers, which in turn govern the outcomes of tasks, combat, or character generation. Without die rolls, players could make choices with perfect knowledge of the outcome. Life rarely allows us to know for sure how a choice or an action will turn out. **Traveller** presents situations with many possible outcomes and imposes die rolls to determine the outcome. The rolls may be weighted toward some outcomes more than others, but there's always the chance that something could go wrong. Players make decisions throughout **Traveller**; the die rolls make those decisions interesting.

The **Traveller** game system uses six-sided dice exclusively. This convention in **Traveller** began in the earliest versions of the game as a reaction to the wide variety of dice used in fantasy role-playing game systems. Six-sided dice are easy to find and easy to understand.

Linguistically, the dice is plural; die is singular: one die, two dice, three dice.

In most role-playing, the types of dice used are identified by the letter D followed by the number of sides: D6 indicates a six-sided die; D8 indicates an eight-sided die, D20 indicates a twenty-sided die.

When more than one die is to be rolled, the number of dice is indicated by a number in front of the D: 2D6 is two six-sided dice; 5D20 is five twenty-sided dice.

Only Six Sided Dice

The **Traveller** system, however, uses D6 dice exclusively. Sometimes the system contorts D6 die rolls to achieve even distributions from 1 to 10 or 1 to 9. While purists may object, no one else will mind if you use an available D10 or D20.

Dice Abbreviations and Instructions

The **Traveller** game rules routinely calls for specific and often complex die rolls. In charts especially, these instructions generally take the form 1D, 2D, or Flux.

A capital D indicates that a standard six-sided die is used. The number in front of the die tells how many of these dice to roll, and any addition (or subtraction) after the D indicates how the die roll result is changed.

Typical instructions include:

1D. Roll one die.

2D. Roll two dice (or 8D: Roll 8 Dice)

2D-2. Roll two dice and subtract 2.

2D-7. Roll two dice and subtract 7. This roll may produce negative numbers (the result of this throw is identical in output to Flux and with D-D).

2D+2. Roll two dice and add 2.

D-D (or +D-D). Roll one die, then roll a second die and subtract it from the first. This roll may produce negative numbers (the result of this throw is identical in output with 2D-7 and with D-D).

D/2. Roll on die and divide by 2. The accepted convention is to round in favor of the rolling player.

Flux. Roll one die, then roll a second die and subtract it from the first. This roll may produce negative numbers (the result is identical in output to 2D-7 and with D-D).

(2D +3) x (3D-2). Roll two dice and add three, then roll three dice and subtract two, and then multiply the two together. This one is probably not used very often.

BASIC TERMS

The following basic terms apply to dice:

Dice. The randomizers used in **Traveller** are ordinary six-sided cubic dice marked with sides marked 1 to 6.

Die Roll. The result of rolling the dice.

D. Abbreviation for six-sided dice. Other game systems may use different dice. The convention is a die with 3 sides is D3; a die with 10 sides is D10.

D6. Another abbreviation for six-sided dice. This term is encountered and reiterates that the dice used are six sided.

Roll. An instruction to roll dice. A rare synonym is Throw. For example, Roll 2D. Throw 2D.

Target Number. The number the player is trying to roll. Some uses of dice call for a specific number to be rolled. Others call for a number or less to be rolled. Still others call for a number or greater to be rolled. In each case, focus is on a Target Number.

Modifier. Mod. Instructions may call for modifiers which increase or decrease the target number. As compared to a DM which alters the actual Die Roll. Mods are primarily used with Target Numbers.

DM. Die Modifier. Dice Modifier. Instructions may call for Die Modifiers for an event, such as DM +1 or DM -3. A DM changes the roll of the dice before it is compared to the target number, as opposed to a Mod which changes the target number itself. DMs are primarily used on Tables.

Throw: An instruction to roll dice. A synonym is Roll.

Mods Versus DMs

It is important to understand the difference between Mods and DMs.

A **Mod** is an Asset and a component of the Target Number.

A **DM** is a change to the Die Roll and is applied to the dice after they are rolled.

For example, the typical **Traveller** usage is Roll Low. The situation defines some Target which is the number (or less) that the player is trying to roll.

MOD VS DM (Roll Low)

Mod +	Increases Target	=More Success
DM -	Decreases Die	
Mod -	Decreases Target	=Less Success
DM +	Increases Die	

A **Mod** changes the Target Number. Mod+3 increases the Target Number by three and makes it easier to roll lower than the Target; positive Mods are beneficial. Mod-2 decreases the Target Number by two and makes it harder to roll lower than the Target; negative Mods are detrimental.

A **DM** changes the die roll. DM +3 increases the Die Roll by three and makes it harder to roll lower than the Target; positive DMs are detrimental. DM-2 decreases the Die Roll by two and makes it easier to roll lower than the Target; negative DMs are beneficial.

BE PREPARED

The referee and each player should have a pool of dice:

Ten Six-Sided White Dice. These dice are used for standard rolls. Actually, any of the dice shown here can be used for standard rolls.

Two Contrasting Flux Dice. Two dice of contrasting colors are used as Flux Dice. The lighter colored die is always positive; the darker colored die is negative.

Even Distribution
From 1 to 9

	1	2	3	4	5	6
1	1	2	3	1	2	3
2	4	5	6	4	5	6
3	7	8	9	7	8	9
4	1	2	3	1	2	3
5	4	5	6	4	5	6
6	7	8	9	7	8	9

This table produces an equal chance of achieving the digits 1 through 9.

Even Distribution
From 0 to 9 (or 1 to 10).

	1	2	3	4	5	6
1	0	0	0	1	1	1
2	2	2	2	3	3	3
3	4	4	4	5	5	5
4	6	6	6	7	7	7
5	8	8	8	9	9	9
6	rr	rr	rr	rr	rr	rr

This table produces the digits 0 through 9 equally.
rr= reroll.

Randomly Selected C1 C2 C3 C4 C5 C6

1D	Char	1	2	3	4	5	6
1	C1			Strength			
2	C2	Agility		Dexterity		Grace	
3	C3	Stamina		Endurance		Vigor	
4	C4			Intelligence			
5	C5	Training		Education		Instinct	
6	C6	Charisma		Social		Caste	

If not all Characteristics are in the desired mix, ignore inappropriate results and reroll.

Special Throws

2D Roll	Roll%	D+D	Flux D-D	Flux* 2D-7	2D-2	
2	3%	2	-5	-5	0	
3	6%	3	-4	-4	1	
4	8%	4	-3	-3	2	
5	11%	5	-2	-2	3	
6	14%	6	-1	-1	4	
7	17%	7	0	0	5	
8	14%	8	+1	+1	6	
9	11%	9	+2	+2	7	
10	8%	10	+3	+3	8	
11	6%	11	+4	+4	4	9
12	3%	12	+5	+5	5	10

* Alternate Calculation Method.

EVEN DISTRIBUTIONS

Even Distributions use six-sided dice to produce a range of numbers beyond 1 to 6 (specifically 1-9, or 0-9 or 1-10).

Even Distribution 1 to 9. Consult the Even Distribution From 1 to 9 Table.

This table is most commonly used in creating the Population Multiplier associated with the population exponent of worlds. Because the population multiplier modifies the exponent, a result of 0 or 10 is not applicable.

Even Distribution 0 to 9. Consult the Even Distribution From 0 to 9 Table.

Even distribution between 0 and 9 creates the equivalent of a decimal die (D10). If the desired result is 1 through 10, substitute 10 for 0.

RANDOMLY SELECTED CHARACTERISTICS

There is sometimes (particularly in wounding or damage) a need to select specific characteristics for characters.

Randomly <u>Selected</u> Characteristic. A range of characteristics is stated (usually in Damage as a result of Fighting or a Mishap). Roll 1D= the result is the position code for the selected characteristic.

For example, to randomly select from C1 C2 C3, roll 1D (= 3 selects Characteristic C3). If the die roll does not match a characteristic in the range, reroll.

Randomly <u>Determined</u> Characteristic. A characteristic must be selected (often without regard to those available). Roll 1D for the appropriate column, followed by 1D for the row. For example, rolling 3 and 2 = Stamina.

SPECIAL THROWS

The **Special Throws Tables** show several different combinations of dice and their results.

D +D. *The standard two dice throw.* The range is 2 through 12 centered on 7. This is a variant description of 2D.

+**D -D***. Roll the white die and the black die.* Subtract the black die from the white die. The results range from -5 to +5 centered on 0 (in fact, 0 is most frequent: 6 out of 36 times, or about 17%). This roll is called **Flux**.

2D-7. *Roll two dice and subtract 7.* The range and probabilities are the same as +D -D, but they are achieved somewhat differently.

Although this throw is statistically equivalent to +D -D (and to Flux) it omits the drama.

2D-2. *Roll two dice and subtract 2.* The results range from 0 to 10 centered on 5 (5 is most frequent: 6 out of 36 times).

THE DICE TABLES

The dice tables in **Traveller** are provided as a reference for both players and game masters.

The Reference Tables. The reference tables show the results of throwing one die through ten dice. These dice correspond roughly to the levels of task difficulty:

1D	Easy
2D	Average
+D - D	Flux
3D	Difficult
4D	Formidable
5D	Staggering
6D	Hopeless
7D	Impossible
8D	Beyond Impossible
9D	Hasty Beyond Impossible
10D	Extra Hasty Beyond Impossible, and
varies	C+S

Walking Through The Tables

Look at the dice tables**,** and examine the entries.

Title shows the number of dice being rolled.

Roll: The actual numerical die roll result.

N: The number of times the roll occurs if all possible rolls are each made once. N indicates the number of ways that the die roll can be achieved (for example, on the Two Dice table, a 2D roll of 11 can be achieved two different ways (5 and 6 or 6 and 5).

%**N (Percent N):** The percentage chance that the specific roll will be made.

N- (N Minus). The number of times that the roll **or less** occurs. N- indicates the number of ways the die roll or less can be achieved. For example, in the Two Dice table, a 2D roll of 3 - (three or less) can be achieved three different ways (1 and 2, or 2 and 1, or 1 and 1).

%N- (Percent N Minus). The percentage chance that the specific roll **or less** will be made. This is the percentage chance (on any one throw) that the result will be the roll stated on this line or less. The chance of rolling 7 or less on two dice is 58%.

N+ (N Plus). The number of times that the roll **or more** occurs. N+ indicates the number of ways the die roll or greater can be achieved. For example, in the Two Dice table, a 2D roll of 3 + (three or more) can be achieved 35 different ways (every possible roll except 1 and 1).

%N+ (Percent N Plus). The percentage chance that the specific roll **or less** will be made. Percent N Plus is the percentage chance (on any one throw) that the result will be the roll stated on this line or more. The chance of rolling 3 or more on two dice is 97%.

The C+S Table (Chance Of Success)

Tasks call for die rolls equal to or less than a number which is created by adding a characteristic (also ranging from 1 to 15 or so) and a skill level (ranging from 1 to 15 or so). If the die roll is equal or less than this C + S (Characteristic Plus Skill), the attempt at the task succeeds.

The **Chance of Success Table** shows the percentage chance that such a task will succeed. For example, if a character with Skill-2 and Characteristic-2 (S+C=4) attempts a task, using 2D, he has a 17% chance of succeeding.

Why Is This Chapter Necessary?

Dice and their ability to create random numbers are at the core of this (and most) role-playing games. In the dawn of role-playing game systems, the types of dice were specified, and a variety of rolls were used in the course of the game.

As role-playing games matured, the role-playing media published a variety of articles analyzing the outcomes of various dice mechanics and addressing how they translated into probabilities. Both players and referees who read those articles found that a better understanding led to a better playing experience. That alone should be enough to justify this chapter, but there's more.

This edition of **Traveller** introduces a variety of new dice mechanics and formalizes several older ones. Prior editions often introduced mechanics in the middle of rules discussions, or simply left it to the referee to define a mechanic (for example, to select one thing from a group, or to select a number from 1 to 10). This chapter brings all dice mechanics into one chapter, defines them, and then discusses them in terms of probabilities.

The **C+S Chart** gives any player an indication, in percentage probability terms, of the likelihood of success for specific tasks. He isn't required to guess about potential success, and he isn't required to make detailed calculations.

The **Dice Charts** give similar information about rolling one die, or ten dice, or any number in between. The tables show that there is a chance of rolling 10 on 10D, but at 60,466,176 to 1, it is probably better to spend any possible good luck involved on the lottery than on a single role-playing die roll.

An understanding of the dice mechanics in **Traveller** creates better players more capable of using the nuances of the game system to their advantage. That same understanding creates better referees more capable of presenting interesting and challenging situations to the players.

Dice

The Dice Charts reflect the statistical details of dice rolls. Using these charts, any player or referee can understand the probability that any specific dice roll will succeed.

Dice-1

1D ONE DIE (6^1 = 6 outcomes; range 1-6)

Roll	N	N%	N -	N -%	N+	N+%
0	0	no	0	no	6	100%
1	1	17%	1	17%	6	100%
2	1	17%	2	33%	5	83%
3	1	17%	3	50%	4	67%
4	1	17%	4	67%	3	50%
5	1	17%	5	83%	2	33%
6	1	17%	6	100%	1	17%
7	0	no	6	100%	0	no

There are 6 possible outcomes ranging from 1 to 6.
Outcomes are equally possible; the average is 3.5 (3 or 4).

2D TWO DICE (6^2 = 36 outcomes; range 2-12)

Roll	N	N%	N -	N -%	N+	N+%
1	0	no	0	no	36	100%
2	1	3%	1	3%	36	100%
3	2	6%	3	8%	35	97%
4	3	8%	6	17%	33	92%
5	4	11%	10	28%	30	83%
6	5	14%	15	42%	26	72%
7	6	17%	21	58%	21	58%
8	5	14%	26	72%	15	42%
9	4	11%	30	83%	10	28%
10	3	8%	33	92%	6	17%
11	2	6%	35	97%	3	8%
12	1	3%	36	100%	1	3%
13	0	no	36	100%	0	no

There are 36 possible outcomes ranging from 2 to 12.
The most probable roll is 7 (17%).

3D THREE DICE (6^3 = 216 outcomes; range 3-18)

Roll	N	N%	N -	N -%	N+	N+%
1	0	no	0	100%	216	100%
2	0	no	0	100%	216	100%
3	1	<1%	1	<1%	216	100%
4	3	1%	4	2%	215	>99%
5	6	3%	10	5%	212	98%
6	10	5%	20	9%	206	95%
7	15	7%	35	16%	196	91%
8	21	10%	56	26%	181	84%
9	25	12%	81	38%	160	74%
10	27	13%	108	50%	135	63%
11	27	13%	135	63%	108	50%
12	25	12%	160	74%	81	38%
13	21	10%	181	84%	56	26%
14	15	7%	196	91%	35	16%
15	10	5%	206	95%	20	9%
16	6	3%	212	98%	10	5%
17	3	1%	215	>99%	4	2%
18	1	<1%	216	100%	1	<1%
19	0	no	216	no	0	no

There are 216 possible outcomes ranging from 3 to 18.
The most probable roll is 10 or 11 (equally at 13% each).

4D FOUR DICE (6^4 = 1296 outcomes; range 4 - 24)

Roll	N	N%	N -	N -%	N+	N+%
0	0	no	0	no	1296	100%
1	0	no	0	no	1296	100%
2	0	no	0	no	1296	100%
3	0	no	0	no	1296	100%
4	1	<1%	1	<1%	1296	100%
5	4	<1%	5	<1%	1295	>99%
6	10	<1%	15	1%	1291	>99%
7	20	2%	35	3%	1281	99%
8	35	3%	70	5%	1261	97%
9	56	4%	126	10%	1226	95%
10	80	6%	206	16%	1170	90%
11	104	8%	310	24%	1090	84%
12	125	10%	435	34%	986	76%
13	140	11%	575	44%	861	66%
14	146	11%	721	56%	721	56%
15	140	11%	861	66%	575	44%
16	125	10%	986	76%	435	34%
17	104	8%	1090	84%	310	24%
18	80	6%	1170	90%	206	16%
19	56	4%	1226	95%	126	10%
20	35	3%	1261	97%	70	5%
21	20	2%	1281	99%	35	3%
22	10	<1%	1291	>99%	15	1%
23	4	<1%	1295	>99%	5	<1%
24	1	<1%	1296	100%	1	<1%
25	0	no	1296	100%	0	no
26	0	no	1296	100%	0	no
27	0	no	1296	100%	0	no

There are 1296 possible outcomes ranging from 4 to 24.
The most probable roll is 14 (11.3%).

FLUX TWO DICE -7 (6^2 = 36 outcomes; - 5 to +5)

Roll	N	N%	N -	N -%	N+	N+%
- 6	0	no	0	no	36	100%
- 5	1	3%	1	3%	36	100%
-4	2	6%	3	8%	35	97%
-3	3	8%	6	17%	33	92%
-2	4	11%	10	28%	30	83%
-1	5	14%	15	42%	26	72%
0	6	17%	21	58%	21	58%
+1	5	14%	26	72%	15	42%
+2	4	11%	30	83%	10	28%
+3	3	8%	33	92%	6	17%
+4	2	6%	35	97%	3	8%
+5	1	3%	36	100%	1	3%
+6	0	no	36	100%	0	no

There are 36 possible outcomes ranging from – 5 to +5.
The most probable roll is 0 (17%).

Flux introduces additional variation into dice rolls. It offers the opportunity for an additional modification up to 5 points in the player's favor, but at the risk of receiving instead up to 5 points negatively.

Dice

The Dice Charts reflect the statistical details of dice rolls. Using these charts, any player or referee can understand the probability that any specific dice roll will succeed.

5D FIVE DICE (6^5 = 7776 outcomes; range 5 - 30)

Roll	N	N%	N -	N -%	N+	N+%
0	0	no	0	no	7776	100%
1	0	no	0	no	7776	100%
2	0	no	0	no	7776	100%
3	0	no	0	no	7776	100%
4	0	no	0	no	7776	100%
5	1	<1%	1	<1%	7776	100%
6	5	<1%	6	<1%	7775	>99%
7	15	<1%	21	<1%	7770	>99%
8	35	<1%	56	<1%	7755	>99%
9	70	<1%	126	2%	7720	>99%
10	126	2%	252	3%	7650	98%
11	205	3%	457	6%	7524	97%
12	305	4%	762	10%	7319	94%
13	420	5%	1182	15%	7014	90%
14	540	7%	1722	22%	6594	85%
15	651	8%	2373	31%	6054	78%
16	735	9%	3108	40%	5403	69%
17	780	10%	3888	50%	4668	60%
18	780	10%	4668	60%	3888	50%
19	735	9%	5403	69%	3108	40%
20	651	8%	6054	78%	2373	31%
21	540	7%	6594	85%	1722	22%
22	420	5%	7014	90%	1182	15%
23	305	4%	7319	94%	762	10%
24	205	3%	7524	97%	457	6%
25	126	2%	7650	98%	252	3%
26	70	<1%	7720	>99%	126	2%
27	35	<1%	7755	>99%	56	<1%
28	15	<1%	7770	>99%	21	<1%
29	5	<1%	7775	>99%	6	<1%
30	1	<1%	7776	100%	1	<1%
31	0	no	7776	100%	0	no
32	0	no	7776	100%	0	no
33	0	no	7776	100%	0	no
34	0	no	7776	100%	0	no
35	0	no	7776	100%	0	no
36	0	no	7776	100%	0	no
37	0	no	7776	100%	0	no

There are 7776 possible outcomes ranging from 5 to 30.
The most probable roll is 17 or 18 (equally at 10% each).

6D SIX DICE (6^6 = 46,656 outcomes; range 6 - 36)

Roll	N	N%	N -	N -%	N+	N+%
0	0	<1%	0	no	46656	100%
1	0	<1%	0	no	46656	100%
2	0	<1%	0	no	46656	100%
3	0	<1%	0	no	46656	100%
4	0	<1%	0	no	46656	100%
5	0	<1%	0	no	46656	100%
6	1	<1%	1	<1%	46656	100%
7	6	<1%	7	<1%	46655	>99%
8	21	<1%	28	<1%	46649	>99%
9	56	<1%	84	<1%	46628	>99%
10	126	<1%	210	<1%	46572	>99%
11	252	<1%	462	<1%	46446	>99%
12	456	<1%	918	2%	46194	>99%
13	756	2%	1674	4%	45738	98%
14	1161	2%	2835	6%	44982	96%
15	1666	4%	4501	10%	43821	94%
16	2247	5%	6748	14%	42155	90%
17	2856	6%	9604	21%	39908	86%
18	3431	7%	13035	28%	37052	79%
19	3906	8%	16941	36%	33621	72%
20	4221	9%	21162	45%	29715	64%
21	4332	9%	25494	55%	25494	55%
22	4221	9%	29715	64%	21162	45%
23	3906	8%	33621	72%	16941	36%
24	3431	7%	37052	79%	13035	28%
25	2856	6%	39908	86%	9604	21%
26	2247	5%	42155	90%	6748	14%
27	1666	4%	43821	94%	4501	10%
28	1161	2%	44982	96%	2835	6%
29	756	2%	45738	98%	1674	4%
30	456	<1%	46194	>99%	918	2%
31	252	<1%	46446	>99%	462	<1%
32	126	<1%	46572	>99%	210	<1%
33	56	<1%	46628	>99%	84	<1%
34	21	<1%	46649	>99%	28	<1%
35	6	<1%	46655	>99%	7	<1%
36	1	<1%	46656	100%	1	<1%
37	0	no	46656	100%	0	no

There are 46,656 possible outcomes ranging from 6 to 36.
The most probable roll is 21 (9.3%).

READING THE DICE CHARTS

The Dice Charts show the possible outcomes of dice from 1D (a single six-sided die) to 10D (ten six-sided dice). These charts are not used directly in the course of play; instead, a player or referee can consult the charts to determine the likelihood of specific outcomes. For example, if rolling two six-sided dice, the 2D Chart shows: 36 possible outcomes ranging from 2 to 12; a 7 is possible 6 (N=6) out of 36 times, or 17% (N%= 17%); a 4 or less is possible 6 (N- = 6) out of 36 outcomes.

Results are rounded to even percent except at the ends of the scales.

<1%. The result has a probability of less than 1%. There is less than one chance in 100 that this result will occur.

>99%. The result has a probability of greater than 99%. There is less than one chance in 100 that this result will not occur.

N. The number of times the die roll result will occur in all possible outcomes.

N%. The percentage chance of this die roll result occurring. Calculated as N / Outcomes.

N- (N minus). The number of times this die roll or less result will occur in all possible outcomes.

N-%. The percentage chance of this die roll result or less occurring. Calculated as N- / Outcomes.

N+ (N plus). The number of times this die roll result or more will occur in all possible outcomes.

N+%. The percentage chance of this die roll result or more occurring. Calculated as N+ / Outcomes.

Dice

The Dice Charts reflect the statistical details of dice rolls. Using these charts, any player or referee can understand the probability that any specific dice roll will succeed.

Dice-3

7D SEVEN DICE (6^7 = 279,936 outcomes; 7 - 42)

Roll	N	N%	N -	N -%	N+	N+%
0	0	<1%	0	no	279936	100%
1	0	<1%	0	no	279936	100%
2	0	<1%	0	no	279936	100%
3	0	<1%	0	no	279936	100%
4	0	<1%	0	no	279936	100%
5	0	<1%	0	no	279936	100%
6	0	<1%	0	no	279936	100%
7	1	<1%	1	<1%	279936	100%
8	7	<1%	8	<1%	279935	>99%
9	28	<1%	36	<1%	279928	>99%
10	84	<1%	120	<1%	279900	>99%
11	210	<1%	330	<1%	279816	>99%
12	462	<1%	792	<1%	279606	>99%
13	917	<1%	1709	<1%	279144	>99%
14	1667	<1%	3376	1%	278227	>99%
15	2807	1%	6183	2%	276560	99%
16	4417	2%	10600	4%	273753	98%
17	6538	2%	17138	6%	269336	96%
18	9142	3%	26280	9%	262798	94%
19	12117	4%	38397	14%	253656	91%
20	15267	5%	53664	19%	241539	86%
21	18327	7%	71991	26%	226272	81%
22	20993	7%	92984	33%	207945	74%
23	22967	8%	115951	41%	186952	67%
24	24017	9%	139968	50%	163985	59%
25	24017	9%	163985	59%	139968	50%
26	22967	8%	186952	67%	115951	41%
27	20993	7%	207945	74%	92984	33%
28	18327	7%	226272	81%	71991	26%
29	15267	5%	241539	86%	53664	19%
30	12117	4%	253656	91%	38397	14%
31	9142	3%	262798	94%	26280	9%
32	6538	2%	269336	96%	17138	6%
33	4417	2%	273753	98%	10600	4%
34	2807	1%	276560	99%	6183	2%
35	1667	<1%	278227	>99%	3376	1%
36	917	<1%	279144	>99%	1709	<1%
37	462	<1%	279606	>99%	792	<1%
38	210	<1%	279816	>99%	330	<1%
39	84	<1%	279900	>99%	120	<1%
40	28	<1%	279928	>99%	36	<1%
41	7	<1%	279935	>99%	8	<1%
42	1	<1%	279936	100%	1	<1%
43	0	no	279936	100%	0	no
44	0	no	279936	100%	0	no
45	0	no	279936	100%	0	no
46	0	no	279936	100%	0	no
47	0	no	279936	100%	0	no
48	0	no	279936	100%	0	no
49	0	no	279936	100%	0	no

There are 279,936 possible outcomes ranging from 7 to 42. The most probable roll is 24 or 25 (equally at 9% each).

8D EIGHT DICE (6^8 = 1,679,616 outcomes; 8 - 48)

Roll	N	N%	N -	N -%	N+	N+%
0	0	no	0	no	1679616	100%
1	0	no	0	no	1679616	100%
2	0	no	0	no	1679616	100%
3	0	no	0	no	1679616	100%
4	0	no	0	no	1679616	100%
5	0	no	0	no	1679616	100%
6	0	no	0	no	1679616	100%
7	0	no	0	no	1679616	100%
8	1	<1%	1	<1%	1679616	100%
9	8	<1%	9	<1%	1679615	>99%
10	36	<1%	45	<1%	1679607	>99%
11	120	<1%	165	<1%	1679571	>99%
12	330	<1%	495	<1%	1679451	>99%
13	792	<1%	1287	<1%	1679121	>99%
14	1708	<1%	2995	<1%	1678329	>99%
15	3368	<1%	6363	<1%	1676621	>99%
16	6147	<1%	12510	<1%	1673253	>99%
17	10480	1%	22990	1%	1667106	>99%
18	16808	1%	39798	2%	1656626	99%
19	25488	2%	65286	4%	1639818	98%
20	36688	2%	101974	6%	1614330	96%
21	50288	3%	152262	9%	1577642	94%
22	65808	4%	218070	13%	1527354	91%
23	82384	5%	300454	18%	1461546	87%
24	98813	6%	399267	24%	1379162	82%
25	113688	7%	512955	31%	1280349	76%
26	125588	7%	638543	38%	1166661	69%
27	133288	8%	771831	46%	1041073	62%
28	135954	8%	907785	54%	907785	54%
29	133288	8%	1041073	62%	771831	46%
30	125588	7%	1166661	69%	638543	38%
31	113688	7%	1280349	76%	512955	31%
32	98813	6%	1379162	82%	399267	24%
33	82384	5%	1461546	87%	300454	18%
34	65808	4%	1527354	91%	218070	13%
35	50288	3%	1577642	94%	152262	9%
36	36688	2%	1614330	96%	101974	6%
37	25488	2%	1639818	98%	65286	4%
38	16808	1%	1656626	99%	39798	2%
39	10480	<1%	1667106	>99%	22990	1%
40	6147	<1%	1673253	>99%	12510	<1%
41	3368	<1%	1676621	>99%	6363	<1%
42	1708	<1%	1678329	>99%	2995	<1%
43	792	<1%	1679121	>99%	1287	<1%
44	330	<1%	1679451	>99%	495	<1%
45	120	<1%	1679571	>99%	165	<1%
46	36	<1%	1679607	>99%	45	<1%
47	8	<1%	1679615	>99%	9	<1%
48	1	<1%	1679616	100%	1	<1%
49	0	<1%	1679616	100%	0	no

There are 1,679,616 possible outcomes ranging from 8 to 48. The most probable roll is 28 (8%).

Dice

The Dice Charts reflect the statistical details of dice rolls. Using these charts, any player or referee can understand the probability that any specific dice roll will succeed.

9D NINE DICE (6^9 = 10,077,696; range 9 - 56)

Roll	N	N%	N -	N -%	N+	N+%
8	0	no	0	no	10077696	100%
9	1	no	1	no	10077696	100%
10	9	no	10	no	10077695	100%
11	45	no	55	no	10077686	100%
12	165	no	220	no	10077641	100%
13	495	no	715	no	10077476	100%
14	1287	no	2002	no	10076981	100%
15	2994	no	4996	no	10075694	100%
16	6354	no	11350	no	10072700	100%
17	12465	no	23815	no	10066346	100%
18	22825	no	46640	no	10053881	100%
19	39303	no	85943	1%	10031056	100%
20	63999	1%	149942	1%	9991753	99%
21	98979	1%	248921	2%	9927754	99%
22	145899	1%	394820	4%	9828775	98%
23	205560	2%	600380	6%	9682876	96%
24	277464	3%	877844	9%	9477316	94%
25	359469	4%	1237313	12%	9199852	91%
26	447669	4%	1684982	17%	8840383	88%
27	536569	5%	2221551	22%	8392714	83%
28	619569	6%	2841120	28%	7856145	78%
29	689715	7%	3530835	35%	7236576	72%
30	740619	7%	4271454	42%	6546861	65%
31	767394	8%	5038848	50%	5806242	58%
32	767394	8%	5806242	58%	5038848	50%
33	740619	7%	6546861	65%	4271454	42%
34	689715	7%	7236576	72%	3530835	35%
35	619569	6%	7856145	78%	2841120	28%
36	536569	5%	8392714	83%	2221551	22%
37	447669	4%	8840383	88%	1684982	17%
38	359469	4%	9199852	91%	1237313	12%
39	277464	3%	9477316	94%	877844	9%
40	205560	2%	9682876	96%	600380	6%
41	145899	1%	9828775	98%	394820	4%
42	98979	1%	9927754	99%	248921	2%
43	63999	1%	9991753	99%	149942	1%
44	39303	no	10031056	100%	85943	1%
45	22825	no	10053881	100%	46640	no
46	12465	no	10066346	100%	23815	no
47	6354	no	10072700	100%	11350	no
48	2994	no	10075694	100%	4996	no
49	1287	no	10076981	100%	2002	no
50	495	no	10077476	100%	715	no
51	165	no	10077641	100%	220	no
52	45	no	10077686	100%	55	no
53	9	no	10077695	100%	10	no
54	1	no	10077696	100%	1	no
55	0	no	10077696	100%	0	no

There are 10,077,696 possible outcomes ranging from 9 to 54. The most probable roll is 31 or 32 (equally probable at 8% each).

10D TEN DICE (6^10 = 60,466,176; range 10 – 60)

Roll	N	N%	N -	N -%	N+	N+%
9	0	no	0	no	60466176	100%
10	1	no	1	no	60466176	100%
11	10	no	11	no	60466175	100%
12	55	no	66	no	60466165	100%
13	220	no	286	no	60466110	100%
14	715	no	1001	no	60465890	100%
15	2002	no	3003	no	60465175	100%
16	4995	no	7998	no	60463173	100%
17	11340	no	19338	no	60458178	100%
18	23760	no	43098	no	60446838	100%
19	46420	no	89518	no	60423078	100%
20	85228	no	174746	no	60376658	100%
21	147940	no	322686	1%	60291430	100%
22	243925	no	566611	1%	60143490	99%
23	383470	1%	950081	2%	59899565	99%
24	576565	1%	1526646	3%	59516095	98%
25	831204	1%	2357850	4%	58939530	97%
26	1151370	2%	3509220	6%	58108326	96%
27	1535040	3%	5044260	8%	56956956	94%
28	1972630	3%	7016890	12%	55421916	92%
29	2446300	4%	9463190	16%	53449286	88%
30	2930455	5%	12393645	20%	51002986	84%
31	3393610	6%	15787255	26%	48072531	80%
32	3801535	6%	19588790	32%	44678921	74%
33	4121260	7%	23710050	39%	40877386	68%
34	4325310	7%	28035360	46%	36756126	61%
35	4395456	7%	32430816	54%	32430816	54%
36	4325310	7%	36756126	61%	28035360	46%
37	4121260	7%	40877386	68%	23710050	39%
38	3801535	6%	44678921	74%	19588790	32%
39	3393610	6%	48072531	80%	15787255	26%
40	2930455	5%	51002986	84%	12393645	20%
41	2446300	4%	53449286	88%	9463190	16%
42	1972630	3%	55421916	92%	7016890	12%
43	1535040	3%	56956956	94%	5044260	8%
44	1151370	2%	58108326	96%	3509220	6%
45	831204	1%	58939530	97%	2357850	4%
46	576565	1%	59516095	98%	1526646	3%
47	383470	1%	59899565	99%	950081	2%
48	243925	no	60143490	99%	566611	1%
49	147940	no	60291430	100%	322686	1%
50	85228	no	60376658	100%	174746	no
51	46420	no	60423078	100%	89518	no
52	23760	no	60446838	100%	43098	no
53	11340	no	60458178	100%	19338	no
54	4995	no	60463173	100%	7998	no
55	2002	no	60465175	100%	3003	no
56	715	no	60465890	100%	1001	no
57	220	no	60466110	100%	286	no
58	55	no	60466165	100%	66	no
59	10	no	60466175	100%	11	no
60	1	no	60466176	100%	1	no
61	0	no	60466176	100%	0	no

There are 60,466,176 possible outcomes ranging from 10 to 60. The most probable roll is 35 (7%)..

Dice

The Dice Charts reflect the statistical details of dice rolls. Using these charts, any player or referee can understand the probability that any specific dice roll will succeed.

C+S ONE THROUGH EIGHT DICE

Hasty	-	-	EAS	AVE	DIF	FOR	STA	HOP	IMP
Cautious	EAS	AVE	DIF	FOR	STA	HOP	IMP	BEY	-
Task	-	EAS	AVE	DIF	FOR	STA	HOP	IMP	BEY
C+S	0D	1D	2D	3D	4D	5D	6D	7D	8D
0	100%	no	no	no	no	no	no	no	no
1	100%	17%	no	no	no	no	no	no	no
2	100%	33%	3%	no	no	no	no	no	no
3	100%	50%	8%	<1%	no	no	no	no	no
4	100%	67%	17%	2%	<1%	no	no	no	no
5	100%	83%	28%	5%	<1%	<1%	no	no	no
6	100%	100%	42%	9%	1%	<1%	<1%	no	no
7	100%	100%	58%	16%	3%	<1%	<1%	<1%	no
8	100%	100%	72%	26%	5%	<1%	<1%	<1%	<1%
9	100%	100%	83%	38%	10%	2%	<1%	<1%	<1%
10	100%	100%	92%	50%	16%	3%	<1%	<1%	<1%
11	100%	100%	97%	63%	24%	6%	<1%	<1%	<1%
12	100%	100%	100%	74%	34%	10%	2%	<1%	<1%
13	100%	100%	100%	84%	44%	15%	4%	<1%	<1%
14	100%	100%	100%	91%	56%	22%	6%	1%	<1%
15	100%	100%	100%	95%	66%	31%	10%	2%	<1%
16	100%	100%	100%	98%	76%	40%	14%	4%	<1%
17	100%	100%	100%	>99%	84%	50%	21%	6%	1%
18	100%	100%	100%	100%	90%	60%	28%	9%	2%
19	100%	100%	100%	100%	95%	69%	36%	14%	4%
20	100%	100%	100%	100%	97%	78%	45%	19%	6%
21	100%	100%	100%	100%	99%	85%	55%	26%	9%
22	100%	100%	100%	100%	>99%	90%	64%	33%	13%
23	100%	100%	100%	100%	>99%	94%	72%	41%	18%
24	100%	100%	100%	100%	100%	97%	79%	50%	24%
25	100%	100%	100%	100%	100%	98%	86%	59%	31%
26	100%	100%	100%	100%	100%	>99%	90%	67%	38%
27	100%	100%	100%	100%	100%	>99%	94%	74%	46%
28	100%	100%	100%	100%	100%	>99%	96%	81%	54%
29	100%	100%	100%	100%	100%	>99%	98%	86%	62%
30	100%	100%	100%	100%	100%	100%	>99%	91%	69%
31	100%	100%	100%	100%	100%	100%	>99%	94%	76%
32	100%	100%	100%	100%	100%	100%	>99%	96%	82%
33	100%	100%	100%	100%	100%	100%	>99%	98%	87%
34	100%	100%	100%	100%	100%	100%	>99%	99%	91%
35	100%	100%	100%	100%	100%	100%	>99%	>99%	94%
36	100%	100%	100%	100%	100%	100%	100%	>99%	96%
37	100%	100%	100%	100%	100%	100%	100%	>99%	98%
38	100%	100%	100%	100%	100%	100%	100%	>99%	99%
39	100%	100%	100%	100%	100%	100%	100%	>99%	>99%
40	100%	100%	100%	100%	100%	100%	100%	>99%	>99%
41	100%	100%	100%	100%	100%	100%	100%	>99%	>99%
42	100%	100%	100%	100%	100%	100%	100%	100%	>99%
43	100%	100%	100%	100%	100%	100%	100%	100%	>99%
44	100%	100%	100%	100%	100%	100%	100%	100%	>99%
45	100%	100%	100%	100%	100%	100%	100%	100%	>99%
46	100%	100%	100%	100%	100%	100%	100%	100%	>99%
47	100%	100%	100%	100%	100%	100%	100%	100%	>99%
48	100%	100%	100%	100%	100%	100%	100%	100%	100%
Default	-	-	EAS	AVE	DIF	FOR	STA	HOP	IMP
Hasty	-	-	-	EAS	AVE	DIF	FOR	STA	HOP
Cautious	-	EAS	AVE	DIF	FOR	STA	HOP	IMP	BEY

READING THE C+S CHART

This table shows the chance of rolling less than the number C+S (Skill + Characteristic).

For example, if (in resolving a 3D Difficult task), the skill level is 4 and the characteristic is 7, then C+S = 11. The chance of rolling 11 or less on 3D is 63%.

100%: The result is automatic or 100% probable.

No: The result is not possible; zero percent probability.

<1%. The result has a probability of less than 1%. There is less than one chance in 100 that this result will occur.

>99%. The result has a probability of greater than 99%. There is less than one chance in 100 that this result will **not** occur.

DIFFICULTY HEADERS

Abbrev	Description
EAS	Easy
AVE	Average
DIF	Difficult
FOR	Formidable
STA	Staggering
HOP	Hopeless
IMP	Impossible
BEY	Beyond Impossible

The columns on the C+S Chart are labeled with the typical difficulty for tasks.

For example, the standard for an AVE Average Task is 2D. A Hasty AVE Average Task is one level of difficulty more difficult, which is 3D; a Cautious AVE Average Task is one level of difficulty easier, which is 1D. The headings on the C+S Chart reflect these considerations.

Flux

Flux is a standard system for creating a reasonable variation between -5 and +5.

Flux is **Traveller's** quick and easy dice-rolling mechanism for creating a reasonable range of variation between -5 and +5. The most probable result is zero: no change.

Rolling Flux: Flux is rolled with two dice. Roll 1D. Roll a second 1D and subtract it from the first. This process is most easily done with a light and a dark die: roll the two dice and subtract the light from the dark. Flux is Light Die minus Dark Die.

Flux = + 1D - 1D

Good Flux. Good Flux is a variant of Flux which produces only positive results (average +2, ranges from +1 to +5). Roll 2D and subtract the smaller from the larger. Good Flux is High Die minus Low Die.

Bad Flux: Bad Flux is a variant of Flux which produces only negative results (average - 2, ranges from - 1 to - 5). Roll 2D and subtract the larger from the smaller. Bad Flux is Low Die minus High Die.

2D TWO DICE

Roll	N	N%	F=
1	0	0%	
2	1	3%	- 5
3	2	6%	- 4
4	3	8%	- 3
5	4	11%	- 2
6	5	14%	- 1
7	6	17%	0
8	5	14%	+1
9	4	11%	+2
10	3	8%	+3
11	2	6%	+4
12	1	3%	+5
13	0	0%	

(6^2 = 36 outcomes; range 2-12)

The most probable roll is 7 (17%). The average result is 7. F= converts 2D to Flux.

FLUX

Roll	N	N%
- 6	0	0%
- 5	1	3%
-4	2	6%
-3	3	8%
-2	4	11%
-1	5	14%
0	6	17%
+1	5	14%
+2	4	11%
+3	3	8%
+4	2	6%
+5	1	3%
+6	0	0%

(6^2 = 36 outcomes; range -5 to +5)

The most probable roll is 0 (17%). The average result is 0.

Good FLUX

Roll	N	N%
- 6	0	0%
- 5	0	0%
-4	0	0%
-3	0	0%
-2	0	0%
-1	0	0%
0	6	17%
+1	10	27%
+2	8	22%
+3	6	17%
+4	4	11%
+5	2	6%
+6	0	0%

(6^2 = 36 outcomes; range 0 to +5)

The most probable roll is +1 (27%). The average result is +2.

Bad FLUX

Roll	N	N%
- 6	0	0%
- 5	2	6%
-4	4	11%
-3	6	17%
-2	8	22%
-1	10	27%
0	6	17%
+1	0	0%
+2	0	0%
+3	0	0%
+4	0	0%
+5	0	0%
+6	0	0%

(6^2 = 36 outcomes; range 0 to -5)

The most probable roll is -1 (27%). The average result is -2.

USING FLUX

Flux makes the labels on die-roll tables more intuitive. While someone familiar with 2D6 recognizes a die roll table labeled 2 to 12, those same entries marked -5 to +5 become more understandable to the player and user: negatives are bad; positives are good; zero is ordinary or unchanged.

Taking a Risk In Pursuit of a Reward. Flux lets a player to try for a benefit but at the risk of consequences. When evaluating a communicator for Ease Of Use, the player rolls Flux: he hopes for +5, but at the risk of rolling -5.

Variation For Die Rolls. Flux introduces additional variation into dice rolls. It offers the opportunity for an additional modification up to 5 points in the player's favor, but at the risk of receiving instead up to 5 points negatively.

Flux introduces natural variation in physical appearance. The Height and Weight tables determine an individual's height and weight based on the physical characteristics. That raw data would imply that all average humans SDE=777 are 1.8 m tall and 73 kg (5'11'' and 169 pounds). Adding Flux to height and a separate Flux to Weight gives an interesting, realistic range of height and weight (just as real humans with about the same physical characteristics may vary widely in height and weight).

Mods for Tasks. Flux is a standard (and convenient) mechanism by which the referee can create Mods on tasks. In many situations, the referee already knows the details of the task, and there is no need to add further detail. In some situations, however, the task is created on the spur of the moment and the details have not been well-thought-out. The referee can surrender the situation to the dice, roll Flux and use the result as a Mod on the task (notice that a positive Flux result is naturally Good; a negative Flux result is naturally Bad).

WHY DEFINE FLUX AT ALL?

By defining Flux once in detail, we avoid constantly redefining the same roll time after time. By defining the term initially, player and referees understand the standard roll when they encounter it. Finally, by defining the Flux as a standard players and referees are encouraged to use it when the appropriate opportunities arise.

The Expanded Hex Code

The **Traveller** game system uses one-digit alphabetic symbols to represent numbers above 9. This usage has a variety of benefits.

Ehex

THE TRAVELLER EXPANDED HEX CODE

The **Traveller** Expanded Hex Code (Ehex) substitutes single digit letters for Arabic numerals above 9. Hexadecimal numbers use A, B, C, D, E, and F for 10, 11, 12, 13, 14 and 15, respectively, to create a base-16 number system (used in some computer systems). The digits I (eye) and O (oh) are omitted to avoid confusion with 1 (one) and 0 (zero)."

The purpose of the Expanded Hex Code is to allow the representation of a value using a single digit, thus facilitating the number-string profiles used in Traveller. For example, the Universal Personality Profile (UPP) represents the six personal characteristics in a string (in the UPP Human format SDEIES). Using single number digits, the values for each profile digit can range from 0 to 9. Using Hex Code, those digit values can range from 0 to 15. Using the Expanded Hex Code, digit values can range from 0 to 33.

Digits may also be assigned arbitrary values or non-numeric meanings in some usages.

NUMBER TO EHEX

Value	Ehex	
0	0	
1	1	
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	decimal
10	A	
11	B	
12	C	
13	D	
14	E	
15	F	hex
16	G	
17	H	
-	I	omitted
18	J	
19	K	
20	L	
21	M	
22	N	
-	O	omitted
23	P	
24	Q	
25	R	
26	S	
27	T	
28	U	
29	V	
30	W	
31	X	unknown
32	Y	special
33	Z	ultimate

Upper and Lower Case. Ehex expects its digits to be UPPER Case. Some situations differentiate stages within an Ehex value by using Upper or Lower Case (the Nobility, for example).

Why Use EHex? EHex was created to allow numbers greater than 9 to occupy one place in a string.

123456	**The Situation** **Traveller** uses many different **strings** of digits to show abilities and values for people, equipment, starships, and other items.
89101112	**The Problem** Numerical values greater than nine take up two (or more) places, making it difficult (sometimes) to join them into readable strings. If any value is greater than 9, the string becomes unreadable.
89ABCD	**The Solution** Make each numerical value one digit: values greater than 9 are assigned a corresponding letter 10=A 11=B 12=C 13=D.

THE TRAVELER HEX CODES

Traveller uses the basic alphanumerics (0-9, A-Z) as single digits to represent numeric values and as codes to represent situational and positional meanings. For example, the alphanumeric A represents 10 in Hex and in Ehex. It can also be used as a code (with no specific numerical meaning).

Dec (Decimal Notation). The digits 0-9 represent the numbers in base-10.

Hex (Hexadecimal Notation). Expanding the numbers available, the letters A-F correspond to the values 10-15 in base-16.

Ehex (Extended Hexadecimal Notation). Further expanding the numbers available, the letters G-Z correspond to the numbers 16-33.

Omit I and O. Because of the potential for confusion, with the digits one (1) and zero (0), the alphabetic letters I and O are omitted.

Special Meanings. Digits may also be assigned arbitrary values or non-numeric meanings in some usages. For example, while XYZ have assigned values 31-32-33, they are (sometimes, often) assigned specialized values like Unknown, Special, or Ultimate.

Question (?) can be used to show an unknown value, and Star (*) can be used to show “any” possible value.

EHEX TO NUMBER

Ehex	Value	
0	0	
1	1	
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	decimal
A	10	
B	11	
C	12	
D	13	
E	14	
F	15	hex
G	16	
H	17	
I	-	omitted
J	18	
K	19	
L	20	
M	21	
N	22	
O	-	omitted
P	23	
Q	24	
R	25	
S	26	
T	27	
U	28	
V	29	
W	30	
X	31	unknown
Y	32	special
Z	33	ultimate

Other Digits

?	Unknown
*	Any

The Ton

The fundamental unit of volume for cargos and freight and for ship construction is the **ton**: a measure of volume in the same way that a displacement ton measures volume on ocean-going ships.

The Ton

The ton is a standard unit of volume commonly used throughout the Imperium. It has applications in starship design, in cargo and freight measurement, and in size designations.

In classic shipbuilding, a ton is the volume of 1000 kilograms of water. A ship with a displacement of 1 ton afloat in water displaces one ton of water.

THE BASIS OF THE TON

A ton is the volume of 1000 kilograms of liquid hydrogen, and is approximately equal to 13.5 cubic meters. While a cube of this volume is approximately 2.4 meters on a size, the ton is more typically shown as a rectangular volume 3 meters high, 3 meters long, and 1.5 meters wide.

Subunits of the Ton. There are instances when volumes less than a ton are more conveniently used (when discussing objects, vehicles, or small craft, for example, and expressing volume in decimal tons is inartful).

SUBUNITS OF THE TON

Unit	Tons	Comment
Ton	1.00	Standard Ton
Ton*	1.037	Regency Ton
Square	0.5	half-ton
Cube	0.25	quarter-ton
Roup	0.10	tenth-ton
Lan	0.01	hundredth ton
Emthree*	0.075	cubic meters
Cyard*	0.05	cubic yard
Cuft*	0.002	cubic foot
Liter	0.00007	
Kiloliter	0.075	

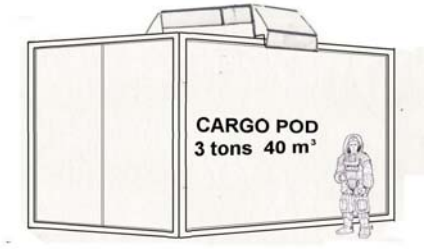
*Archaic or little used.

For example, the smallest available G-Drive is 0.25 tons. It is commonly labeled as a 1-cube drive. A quarter-ton Cube is typically 1.5 meters on a side.

The fusion plant for a grav tank is 0.4 tons. It is commonly labeled a 4-Roup fusion plant, or more rarely a 40-Lan fusion plant. A tenth-ton Roup is a cube slightly more than a meter (1.1 meters) on a side.

A person (a human) probably has a volume of a half-Lan. A hundredth-ton Lan is typically a cube about a half meter (0.502 meters) on a side.

Or, a ton is about 13,500 liters, a Lan is 135 liters. A half-Lan person has a volume (135 /2) = 68 liters. Since a person is mostly water, the weight of a person and 68 liters should be roughly equivalent. A liter of water is 1 kilogram. A half-Lan person should be about 68 kilos = 150 pounds. QED.

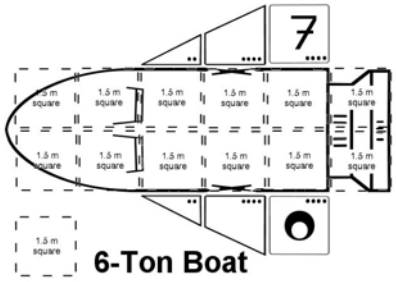


CARGO POD

A three-ton cargo pod measuring 3 meters wide by 3 meters high by 4.5 meters long.

For scale comparison, a half-Lan person (actually closer to a Lan with the vacc suit).

Tightly packed, that cargo container could hold 300 vacc suits or 600 human bodies.



A six-ton small craft showing 1.5 meter deck squares.

TON EQUIVALENTS

Units	Per Ton
Cubic Feet	500
Cubic Yards	18
Kiloliters	13.5
Cubic Meters	13.5

TON DENSITIES

Tons	Material	kg
1	Liquid Hydrogen	1,000
1	Wood	6,750
1	Plastic	12,000
1	Water	13,500
1	Magnesium	25,000
1	Aluminum	35,000
1	Titanium	60,000
1	Steel	100,000

Cubic Meters	13.5
Std Grid Squares	2
Short Grid Squares	4
Tall Grid Squares	1

THE REGENCY TON

The values used for the ton in **Traveller: The New Era** varied slightly from traditional values. Historians call this value the Regency Ton.

One Ton= 14 cubic meters.

Deck Square= 2 meters by 2 meters

Deck Height= 3.5 meters.

Dimensions= 2m x 2m x 3.5 m

Distances and Ranges

Distance is a dominating factor in many interactions: It determines the relative effectiveness of the senses and of sensors, of weapons and attacks, and of communications.

Traveller distills the open-ended concept of distance into a series of range bands, each associated with a typical distance and identified by one or more benchmarks.

For simplicity, and for ease of use in a variety of situations, **Traveller** uses the concept of Range Bands to express the qualitative distance between objects.

THE RANGE BANDS

Ranges are typical distances, standardized for convenience. Using more specific ranges adds little in realism, but much in complexity.

Relative Distances: Descriptive terms state that the distance relation ship between an observer and an object (or an attacker and a target): for example, Range Band 3 has a label Medium (as in Medium Range) and is associated with a distance of approximately 150 meters.

Benchmarks. Range Bands are associated with Benchmarks: with objects which can typically be seen or heard or senses at that distance. For example, a reasonable sense of vision can see a book (or a book-sized object) at Medium range.

Distances. Each Range Band encompasses a spectrum of distances from about half way from the previous range band to about half way to the next range band.

For example, the Medium Range Band extends from about 100 meters to about 325 meters.

THE RANGE BAND CHARTS

The Basics	1a	World Surface Ranges
	1b	Altitudes of the Atmosphere
	1c	Depths of the Ocean
Space	2	Space Ranges
Other Worlds	3a	Gas Giant Altitudes
	3b	StrangeWorld Altitudes
Fame	4	Fame Distances

Sub Bands

Any range band can be subdivided into Sub Bands when the distinction is important.

For example, to reflect various layers within the atmosphere of a Gas Giant, Range 6 is subdivided Bands 6.2, 6.4, 6.6, and 6.8 (which reflect different pressures at those levels).

It is possible to make more extreme Sub Bands (6.1, 6.2, 6.3 and such).

The purpose of Sub Bands is to differentiate rather than lumping all objects at a range into one distance.

The Range to a Sub Band is the range to the Band.

R=	consistently used in Range-related sections to refer to **World** Ranges. R= S+5.
S=	consistently used in Range-related sections to refer to **Space** Ranges. S= R+5.

THE RANGE BAND CHARTS

The Range Band charts and their associated subcharts show distance relationships which govern a variety of interactions.

1a 1b 1c. The **World Charts** show distances (using R=) on world surfaces, atmospheric altitudes, and ocean depths.

World Surface Ranges addresses the typical distances of relatively flat terrain. They are strongly influenced by typical combat ranges and by typical uses of the senses. The Zero or Contact Point is the location of the observer or the character.

Altitudes of the Atmosphere addresses the typical altitudes used by flying vehicles and the typical layers of the atmosphere. The Zero or Surface point is the surface of the world.

Some worlds (most importantly, those with Atmosphere-F Thin Low) have deep canyons or chasms (thousands of kilometers deep) with correspondingly higher atmospheric pressures. The Altitudes table includes negative Altitudes to properly describe these conditions.

Depths of the Oceans addresses the levels or depths of oceans. Levels are important because increased depth imposes increased pressure. The Zero or Surface point is the ocean surface.

Values on the table reflect ocean surface turbulence, and negative values reflect various depths.

Abyss reflects extremes on worlds with unusually deep oceans.

2. The **Space Ranges Chart** shows distances (using S=) in interplanetary space. Interplanetary ranges address the relative distances in space and are used in the operation of long range sensors and in space combat.

Band and Band Name identifies the space combat locations used in space combat.

Stellar and World Diameters shows the range bands corresponding to the stated D values. Diameters govern the effectiveness of lifters, gravitic, maneuver, and jump drives.

Light Delay details the approximate time delay for communicators and sensors.

S= shows the Space Combat Range Band.

R= shows the World Range Band for comparison.

Orbits shows the correspondence of the values to standard orbits.

3a b c. The **Gas Giant Charts** show the depths of massive world atmospheres The **Strangeworlds Chart**s show the atmospheric altitudes for unusual worlds.

Gas Giant Atmospheres addresses the levels or depths of the gas giant atmosphere. Levels are important because increased depth imposes increased pressure and temperature. The Zero or Surface point is the upper layer of the atmosphere (typically the Cloud Deck, and typically with a density of one atmosphere).

Three types of massive worlds are shown: Large Gas Giants (corresponding in size to Jupiter or larger), Small Gas Giants (corresponding in size to Saturn or smaller), and Ice Giants (corresponding to Neptune or Uranus).

Gas Giants are sources of hydrogen for starships in search of cheap fuel, or required to use wilderness refueling. Gas Giant atmosphere levels show the conditions such ships must survive in order to acquire hydrogen.

The **Strangeworld Charts** show the atmospheric altitudes for worlds with dangerous characteristics. The values for these charts may be overlaid on other worlds.

For example, the normal atmospheric values for a world can be taken from 1b Altitudes of the Atmosphere. If that world is a StormWorld (racked by storms constantly, or only currently), the appropriate (H= or Hits=) values created by atmospheric turbulence can be overlaid on Chart 1b.

Inferno is a Venus-Like world with high temperatures.

Stormworld is a world with strong atmospheric turbulence.

Radworld is a world with a high level of surface radioactivity (the 1D Rad levels at altitude 6 and 6.2 are windborne particles).

The Zero or Surface point is the surface of the world.

4. The **Fame Chart** shows the expected distance effect of fame in society.

The **Danger Chart** reflects an evaluation system for threats or potential threats to the continued existence to an object, group, or location. Analysts, officials, or others may subjectively evaluate a danger and express it as Threat-N, where N is the Danger level.

For example, the possibility of the dam breaking outside of town is Threat-5. The activities of a violent anti-government faction may be Threat-8, -9, or even-10. The possibility of a system's star going nova is Threat-14 (a possible supernova might be Threat-17). Scientific research on the origins of the universe (depending on the principles involved) may be Threat-7 or Threat-29.

1a BASIC RANGES

Distance	R=	Descriptor	Benchmark	Range Band Width	S=
Surface	0	Contact	Touching	From the surface to about 25 cm.	
0.5 m	R	Reading	Normal Reading	25 cm to 1 meter.	
1.5 m	T	Talking	Conversations	1 m to about 3 m.	
5 m	1	Vshort	Lectures	3 m to 25 m.	
50 m	2	Short	Pistol Range	25 m to 100 m.	**Space Ranges are World Ranges minus** 5
150 m	3	Medium	Rifle Range	100 m to 300 m (actually 325 m).	
500 m	4	Long	Extreme Gun Range	300 m to 750 m.	
1000 m	5	Vlong		750 m to 3 km.	**B**
5 km	6	Distant	Near the Horizon	3 km to 25 km (actually 27.5 km)	**1**
50 km	7	Vdistant	Beyond the Horizon	25 km to 250 km (actually 275 km).	**2**
500 km	8	Orbit		250 km to 2500 km (actually 2750 km).	**3**
5,000 km	9	Far Orbit		2500 km to 25,000 km (actually 27,500 km).	**4**

"actually" refers to precisely half the distance to the next Range Band value.

SIZES

> Benchmark										
		Needle	Word	Coin	Card	Book	Suitcase	Person	Truck	Tower
Size	**0**	**R**	**T**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Length		1 mm	2 mm	7 mm	75 mm	20 cm	75 cm	1.5 m	7.5 m	75 m

Ranges correspond to Object Sizes. To an observer, any object with Size = Range appears to be the same size.

For example, a Book (Size-3) at Range=3 appears to be the same size as a Coin (Size-1) at Range=1 or a Person (Size-5) at Range=5.

Try it: station a person, a book, and a coin at various distances where they all appear to be the same size and measure the various distances from the viewer to the objects.

5a b c. The **Orbital Distances Chart** shows the standard orbits in star systems.

Orbits may theoretically be at any distance from a central star. Primarily for ease of use, orbital distances are standardized on the Titius-Bode Relation, an 18 th Century attempt to predict orbital values. The actual value predicted values for orbits has been adjusted to include Orbit 0 to accommodate observed orbits.

The Orbital Distances Chart shows Orbit Number (O=) with corresponding distances in AU, Millions of Km, and Light-units.

The far column shows the orbits consumed by giant stars.

For example, for an A0 Ia star, orbits 0 through 3 are inside the star; orbit 4 lies just beyond the surface of the star.

The Habitable Zones Chart shows the orbits with conditions conducive to life based on the primary star for the world.

The Satellite Orbits Chart shows the standard orbits for satellites.

Basic Ranges

Basic Altitudes Depths

1a WORLD SURFACE RANGES

Distance	R=	Descriptor
5,000 km	9	Far Orbit
500 km	8	Orbit
50 km	7	Vdistant
5 km	6	Distant
1000 m	5	Vlong
500 m	4	Long
150 m	3	Medium
50 m	2	Short
5 m	1	Vshort
1.5 m	T	Talking
0.5 m	R	Reading
Surface	0	Contact

Basic Ranges are used in personal and vehicle combat, especially on world surfaces.

Basic Ranges are used with the Senses.

1b ALTITUDES OF THE ATMOSPHERE

Distance	R=	Descriptor
250,000 km	11	Satellite
50,000 km	10	Geo
5,000 km	9	Far Orbit
500 km	8	Orbit
400 km	7.8	Upper8
300 km	7.6	Upper6
200 km	7.4	Upper4
100 km	7.2	Upper2
50 km	7	Upper
30 km	6.8	Mid8
20 km	6.6	Mid6
12 km	6.4	Mid4
8 km	6.2	Mid2
5 km	6	Mid
1000 m	5	Airspace5
500 m	4	Airspace4
150 m	3	Airspace3
50 m	2	NOP
5 m	1	NearSurface
1.5 m	T	Talking
0.5 m	R	Reading
Surface	0	Contact
0.5 m	-R	
1.5 m	-T	
5 m	-1	
50 m	-2	
150 m	-3	
500 m	-4	Chasm Rim
1000 m	-5	Chasm Wall
5 km	-6	Chasm Floor
50 km	-7	
500 km	-8	
5000 km	-9	

NOP= Nap of the Planet.

Chasm= Of special importance on worlds with Atm= F (Thin, Low).

1c DEPTHS OF THE OCEANS

Distance	R=	Descriptor
50 m	2	Tsunami
5 m	1	Vbig Waves
1.5 m	T	Big Waves
0.5 m	R	Waves
Surface	0	Surface
0.5 m	R	Wading
1.5 m	T	Fording
5 m	-1	Pond
50 m	-2	Thermocline
150 m	-3	Shelf
500 m	-4	Lake Bottom
1000 m	-5	Deep Lake
5 km	-6	Bottoms
50 km	-7	Depths
500 km	-8	Abyss
5000 km	-9	

ThermoCline= Of importance in underwater sensor use.

Abyss. Of special importance on Ocean Worlds.

Space Ranges

2 SPACE RANGES

Distance	S=	Descriptor	Band	Band Name	Stellar Diameters*	World Diameters**	Orbits	Light Delay	R=
500 mn km	12		DS	Deep Space			To Orbit 5	30 lm (3 au)	17
150 mn km	11				100 D		To Orbit 3	8 lm (1 au)	16
50 mn km	10	Siege					To Orbit 0	3 lm	15
5 million km	9		LR	Long Range	10 D	1000 D		16 ls	14
2.5 million km	8				1 D			8 ls	13
500,000 km	7		AR	Attack Range		100 D		2 ls	12
250,000 km	6	Missile						1 ls	11
50,000 km	5	Beam	SR	Short Range		10 D			10
5,000 km	4	Far Orbit				1 D			9
500 km	3	Orbit							8
50 km	2	Fighter	F1	Fighter Range					7
5 km	1	Close Fighter	F0						6
1000 m	B	Boarding	B	Boarding					5
500 m									4
150 m									3
50 m									2
5 m									1
1.5 m									T
0.5 m									R
Surface	0								0

S= Space Combat Ranges.

Space Ranges are used with Space Combat and with Space Sensors. S= R-5.

Band= Space Combat Bands.

Space Combat Bands are used in Space Combat, especially with Movement.

R= World Combat Ranges.

World Combat Ranges are used with Personal Combat; they are extended to extreme values for comparison. R= S+5.

Light Delay= Light Speed Distances.

Light Speed Distances provide insight into maximum radio and light time frames over distance.

STELLAR AND WORLD DIAMETERS

*** Assumes Spectral G star.**
Increase Band + 1 for Spectral A or F.
Decrease Band -1 for Spectral K or M.

**** Assumes typical world size = 3+**.
Increase Band +1 for Gas Giant.
Decrease Band -1 for Size 2 or less.

The Diameter Rules

1000 D Maneuver Drives will not operate beyond this limit.

100 D Jump Drives will not operate within this limit.

10 D Gravitic Drives will not operate beyond this limit.

1 D Lifters will not operate beyond this limit.

3a GAS GIANT ATMOSPHERES

Depths	Large Gas Giant R=	P=	T=	Descriptor	Small Gas Giant R=	P=	T=	Descriptor	Ice Giant R=	P=	T=	Descriptor
0	0	1		Cloud Deck	0	1		Cloud Deck	0	1		Cloud Deck
5 km	6	1		NH3 Ice	6	1		Water Ice	6	1		CH4 Ice
10 km	6.2	1		NH3 Ice	6.2	1		NH3 Ice	6.2	1		Clear H2
20 km	6.4	2		Clear H2	6.4	1		Clear H2	6.4	2		NH3 Ice
30 km	6.6	3		NH4SH solid	6.6	1		NH4SH solid	6.6	4		NH3 Ice
40 km	6.8	4		Water Ice	6.8	2		Water Ice	6.8	7		NH3 Ice
50 km	7	6	0	Clear H2	7	2	0	NH3 Water	7	^1		NH3 Ice
100 km	7.2	40	4	Clear H2	7.2	5	1	NH3 Water	7.2	^2		NH3 Ice
200 km	7.4	^3	36	Clear H2	7.4	20	4	Clear H2	7.4	^4	1	NH3 Ice
300 km	7.6	^3	^2	Clear H2	7.6	80	36	Clear H2	7.6	^4	4	NH3 Ice
400 km	7.8	^4			7.8	^3	^2		7.8	^5	36	NH3 Ice
500 km	8	^4			8	^4			8	^5	^2	NH3 Ice
1000 km	8.2	^5			8.2	^5			8.2	^6		
2000 km	8.4	^5			8.4	^6			8.4	^6		Liquid Hydrogen
3000 km	8.8	^6			8.8	^6		Liquid Hydrogen	8.8			
4000 km	9	^6		Liquid Hydrogen	9				9			

R= Range (or Depth from the Upper level of the Atmosphere).

3b StrangeWorlds

Values for StrangeWorlds
can be overlaid on other world atmosphere levels.

Altitude	Inferno R=	P=	T=	Descriptor	StormWorld R=	H=	T=	Descriptor	RadWorld R=	P=	T=	Descriptor
500 km	8	0	0		8	0			8	0		
400 km	7.8	0	0		7.8	0			7.8			
300 km	7.6	0	0		7.6	0			7.6			
200 km	7.4	0	0		7.4	0			7.4			
100 km	7.2	0	0		7.2	0			7.2			
50 km	7	1	0	Cloud Tops	7	0			7			
30 km	6.8	^2	64		6.8	0		Calm	6.8			
20 km	6.6		^2		6.6	5			6.6			
12 km	6.4		^2		6.4	10		Turbulent	6.4			
8 km	6.2		^2		6.2	5			6.2			Rad= 1D
5 km	6		^2		6	0		Calm	6			Rad= 1D
1000 m	5		^2		5	5			5			Rad= 10
Surface	0	^3	^3	Surface	0	10		Turbulence	0			Rad=1000

R= Range (or Altitude from the Surface).

Effects (Applies to All Tables)

P= Pressure in Bars (Terra Surface Pressure = 1). P Effect is Blast-P: P=4 produces Blast-4 = 4D hits.
H= Turbulence in Hits (Calm atmosphere = 0). Effect is Blast-H: H=5 produces Blast-5 = 5D hits.
T= Temperature. If T is Positive, the Effect is Hot-T (T= 6 is Hot-6); if T is Negative, the Effect is Cold-T (T= - 6 is Cold-6).
Values above 99 use are exponents (^2 = 10^2 = 100; ^3 = 10^3 = 1000).

Fame

4a FAME

Distance	F=	Descriptor	Alternate Descriptor
	0	Unknown	
	1	Mother	1 person.
	2	Close Family	
	3	Family	10 people.
	4	Neighborhood	1,000 people.
	5	Town	10,000 people.
	6	City	1,000,000 people.
	7	Urban	
	8	Regional	Small Business
	9	Continental	Corporation
	10	World	
	11	World Complex	
	12	World System	
	13	Inner System	
	14	System	
	15	Greater System	
	16	Outer System	
	17	Systems	
	18	Many Systems	Large Corporation
	19	Subsector	
	20	Sector	MegaCorporation
	21	Domain	
	22	Domain	
	23	Domains	
	24	Empire	
	25	Beyond Empire	
	26	Several Empires	
	27	This Spiral Arm	
	28	Many Spiral Arms	
	29	The Galaxy	
	30	Several Galaxies	
	31	Many Galaxies	
	32	Domain	
	33	All Reality	

Alternates: Based on Fame or Reputation within Organizations or Societies (as opposed to Standard Fame based on distance).

4b DANGER

Size	D=	Descriptor
	0	Safe
	1	Self
	2	Companions
	3	Family
	4	Group
	5	Town
	6	City
10 km	7	Large City
100 km	8	Region
1000 km	9	Continent
	10	World
	11	World Complex
	12	World System
	13	Inner System
	14	System
	15	Greater System
	16	Outer System
	17	Several Systems
	18	Many Systems
	19	Subsector
	20	Sector
	21	Sectors
	22	Domain
	23	Domains
	24	Empire
	25	Beyond Empire
	26	Several Empires
4000 pc	27	This Spiral Arm
10,000 pc	28	Many Spiral Arms
20,000 pc	29	The Galaxy
	30	Several Galaxies
	31	Many Galaxies
	32	The Universe
	33	All Reality

Danger is the relative level of a threat to the continued existence of an object, group, or location.

Danger is often expressed as a threat level: Threat-N where N is the Danger level.

Benchmarks

Understanding the unfamiliar or the unknown is made easier when players have standards against which items can be compared.

A Benchmark is a standard by which objects, concepts, or values can be compared or evaluated. Benchmarks provide the players and the referee with standards by which they can better understand what they encounter.

UNDERSTANDING BENCHMARKS

Benchmarks provide insights into three distinct concepts.

Benchmarks for Value and Cost provide insights and guidelines into the value of money and how it can be earned and used.

Benchmarks for Range help in the understanding of distance and its interaction with the senses, sensors, weapons, and travel times.

Benchmarks for Size provide an understanding and useful measure of relative size.

FINANCIAL INFORMATION

The basic financial information on which economic activities are based includes:

Salaries and Wages. Characters can expect to receive payment for their labor based on specific standards. By knowing the benchmarks, the player can understand if an offer of employment will pay wages which are too low or too high, and they can then react accordingly.

The Cost of Living. The typical costs of housing, meals, and other details give players insights into basic costs which they must meet before they can begin accumulating wealth.

Investment and Speculation Returns. The discussion of investment and speculation provides a basis for players' efforts to accumulate wealth.

Help For The Referee

The Benchmarks support the Referee in deciding on the costs of, and potential rewards from, adventures

FINANCIAL ELEMENTS THAT TRAVELLER IGNORES

Among the elements that are routinely ignored in the course of play are:

Taxes. It is assumed that taxes on goods and income are paid as part of the price or the paycheck. Many mechanisms are possible: Perhaps they are an included Value Added tax, or a routinely imposed sales tax. In any case, taxes are invisible to the user.

Inflation. It is assumed that the rate of inflation is both constant and low, and that it can be ignored for most purposes. Prices are constant and do not change without specific important circumstances.

RATIONAL CONSTRAINTS

History has repeatedly seen the creation of terribly rich people, but with such wealth comes equally terrible responsibilities: primary among them is an all-consuming obsession with the accumulation of wealth. Such extreme wealth is incompatible with the central tenets of **Traveller**. Within **Traveller**, the primary purpose of wealth is to support continuing adventures and travel; a character obsessed with unconscionably great wealth has no time for adventures and is more properly a non-player character (usually willing to spend large amounts of money, or to temporarily lend assets such as starships) to finance adventures which incidentally assist him in amassing even more wealth..

Investments and Speculation may manipulate large amounts of money, but benchmarks indicate amounts which a single individual can rationally expect to receive personally.

For example, the Starship Investment involves millions of credits, but for the characters involved the primary reason for the investment is access to a starship as a means of travel.

SALARIES AND WAGES

The charts provide standard salary levels and wage rates for characters.

Salaries. The Salaries table shows typical salary structures for various character or career types.

For example, a Citizen having served three terms can expect to earn a salary in the range of Cr750 per month (which, according to The Costs of Living table, is slightly more than a C6=Soc character needs to live).

For example, a Spectacular Entertainer with Fame-10 can expect to earn Cr240,000 per year.

Salaries are appropriate for Scholars, Entertainers, Scouts, Naval, and Military characters.

Wages. The Wages table shows typical hourly wage structures for various skill types. A character may decide to work for wages rather than salary if that is more advantageous.

For example, a character with Mechanical-4 can expect to earn Cr10 per hour (= Cr1750 per month). A good Fame-3 Entertainer (who can earn Cr300 per month) may want to work for wages (based on a good skill level) in addition to playing in clubs on weekends.

THE COSTS OF LIVING

The Costs of Living table shows the typical costs an individual expects to pay in the course of living.

INVESTMENTS

Investments focus primarily on creating income streams. Properly employed capital creates a steady stream of income. Contrast Investment with Speculation later.

Stocks and Bonds

Invested capital in relatively safe ventures produces a compounded annual return on investment of between 1% and 2%.

The benefit of a conservative investment is that its chance of loss is almost nil.

The Starship Investment

Bank financing is available to qualified individuals for the purchase of new commercial starships. After a down payment of 20% of the cash price of the starship is made, the shipyard will begin construction of a specific vessel. Upon completion, the vessel is delivered to the buyer, with the bank paying off the purchase price to the shipyard. Because the bank now holds title to the ship, the price must be paid off in a series of monthly payments to it. Standard terms involve the payment of 1/240th of the cash price each month for 480 months. In effect, interest and bank financing cost a simple 120% of the final cost of the ship, and the total financed price equals 220% of the cash purchase price, paid off over a period of 40 years.

In addition, the bank will insist that the purchaser submit an economic plan detailing the projected activity which will guarantee that monthly payments are made.

How Does This Work? Starships are built at shipyards associated with starports. The building process must be profitable, and it has been structured in the following way:

A new MCr10 starship requires an investment by the building shipyard of about MCr6, of which about half is hardware and half is labor. Starports build locally whatever the local economy supports (finely crafted interior finish; astronics, drives). The buyer down payment of 20% (=MCr2) covers most of the required hardware. The starport sells the remaining note (for Cr42,000 per month for 480 months) to a bank (or a Megacorporation) for an amount equal to its remaining costs and a modest profit (=MCr4 + MCr2). The MCr8 note carries a nominal interest rate of about 5.57%. The bank acquires the note for MCr6 and earns close to 8%.

SPECULATION

Speculation focuses on acquiring goods (manufactured goods, luxury goods, commodities) or rights (land grants, intellectual property rights, patents) and selling them within a short period for a profit.

Shopkeepers

Trade is a subset of Speculation: short term buying and selling, making a modest profit sufficient for the proprietor to make a decent living.

Shopkeepers add their labor and expertise to a modest investment in goods (shoes in a shoe store; rooms in a hotel; food in a restaurant; raw materials in a factory) which they resell to the public or to corporate or government clients. A relatively conservative but profitable shopkeeper produces income after expenses.

Rarely does a shopkeeper get rich; most live comfortably off the modest profits of their profession.

Speculators

A speculator buys goods in the expectation that they can be sold at a profit later (and usually on another world). A speculator does not necessarily operate a cargo-carrying starship; a speculator may ship its cargo as freight and pay standard freight rates in order to transport the goods to a profitable market.

Merchant Speculators. A merchant ship crew evaluates trade goods it encounters during its travels, buys those it thinks have merit, and transports them to other worlds in an expectation of selling them at a considerable higher price.

The Land Grant Speculation

Land has no value unless it can be exploited: a process that involves increasing its population and infrastructure (roads, bridges, transportation, factories, an educational system, and government). A long-term land investor can increase his return (his stream of income) from land by developing it.

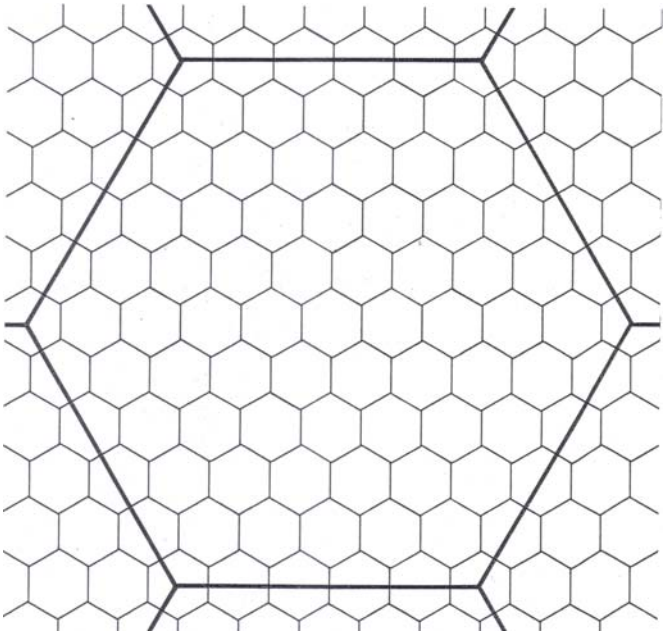
A **Land Grant** differs from actual ownership of land; it confers specific rights and privileges on its holder. These rights include

An **income** based on a nominal portion of the taxes and income that the land produces, escalating as the land is improved.

A **title** (Lord) reflecting possession of the land, and accompanying responsibilities as the final authority to which locals may appeal for the righting of injustice (this authority may be locally delegated).

Outright **land ownership** of one terrain hex (approximately 60 km square).

The Territory. A **land grant** is a gift of real estate- land or privileges - made by the government or other authority as a reward for services to an individual, especially as a reward for service or accomplishment, or as an incentive to develop the land.



A typical Planetary hex is 1000 km in diameter, and consists of 76 smaller terrain or Local hexes. The Planetary hex is 10 Local hexes wide (measured vertex to vertex; each 60 km).

THE SHIP'S ACCOUNT

Each adventuring ship has a continuing need for money to pay expenses such as crew salary, maintenance, life support, and other supplies. The accounting for this cash flow is handled through the Ship's Account.

The ship owner is responsible for maintaining the Ship's Account. In its simplest form, it is a running total all income the ship receives minus all costs the ship incurs.

VALUE, COST, AND PRICE

For any object or thing with a value,

Cost is the amount of money required to produce it

Cost is the wholesale price of the object. Cost Modifiers can change this amount based on Flux, or on specific features.

The Cost to a manufacturer can be reduced based on volume production. A factory spends much less than the wholesale cost by producing in volume.

For example, Dran Corp sells vehicle parts. It buys them from various factories at wholesale. A major part (a Gravitic Translimiter) has a benchmark Value of 3 = Cr10,000, which is what Dran pays for it.

Dran sells Gravitic Translimiters based on supply and demand. This year the supply is (Flux = Quite Common = x 0.8 x 10,000) = Cr8,000. Demand is (Flux = Good = x 1.2 x 10,000) = Cr12,000 each. They make a profit of about Cr4,000 for each one they sell.

Meanwhile, Acme Gravitic Translimiters Corporation manufactures the devices. They produce them in volume (= Value / 10) = Cr1,000 each. They want to sell them for Cr10,000 each, but there is currently an oversupply, so they only sell for Cr8,000 to distributors like Dran Corp.

Cost Modifiers do not usually affect player characters unless they are buying in volume or creating a factory.

Price is the amount of money required to buy it

An ordinary person who needs an object usually goes to a store to buy it. Price Modifiers can change this amount based on Flux, or on specific circumstances.

For example, Eneri Dinsha needs a Gravitic Translimiter for a repair he is making. He goes to the local Dran Corp outlet and sees one on the shelf.

The referee determines (by Flux, or by a decision) that Demand is Good (taken from the example above) so the price is (Value x 1.2 =) Cr12,000.

Price Modifiers can be applied to most items a player character tries to buy. Price Modifiers provide temporary benefits (or obstacles).

Moderation should be used with Price Modifiers; not every object needs to sell for more or less than its Value.

OBJECT SIZE

Benchmark object sizes are expressed in single digits. Special digits R and T correspond to object sizes smaller than 1.

Benchmark sizes show the relative (and approximate) dimensions of objects. Benchmark sizes allow comparisons of different objects, and provide an understanding of overall size.

Benchmark Sizes. The Benchmark Sizes are used with the senses and in combat, and they give players information about carrying or moving objects.

Decimal Sizes

Decimal sizes are typical technological device outputs. For example, a human sees an object in the distance and identifies it as Size 5 (person-sized; about 1.5 meters). A technological device (a range finder; a visual sensor; a sonic detector) provides a more detailed reading as Size 5.3 (person-sized; about 1.8 meters).

Robots. Most robots give their estimates of size in decimal.

How Big Is It Really?

Many objects vary somewhat from the standard size values. The HBIIR? Table allows determination of a more specific size of an object. The result can be translated into decimal size or true units.

Orbital Distances

Orbits are standardized on the traditional Titus-Bode Relation distances primarily for ease of use.

Orbits

5 ORBITAL DISTANCES

	S=	O=	AU	Million km	Light-		Surface of Star inside this Orbit Ia	Ib	II	III
Inner System	10	0	0.2	30	100 ls				A0-F5	A0-K0
		1	0.4	60	200 ls			A0	G0-G5	K5
		2	0.7	105	350 ls			A5-G0	K0	M0
	11	3	1	150	8 lm					
		4	1.6	240	13 lm		A0-F5	G5	K5	
	12	5	2.8	420	30 lm		G0	K0	M0	M5
Outer System		6	5.2	780	43 lm		G5-K0	K5	M5	M9
		7	10	1,500	83 lm		K5	M0	M9	
		8	20	3,000	3 lh		M0	M5-M9		
		9	40	6,000	5 lh		M5-M9			
		10	77	11,550	10 lh	Kuiper Belt				
		11	154	23,100	21 lh	Kuiper Belt				
		12	308	46,200	42 lh					
Remote System		13	615	92,250	3 ld					
		14	1,230	184,500	7 ld					
		15	2,458	368,700	14 ld					
		16	4,916	737,400	4 lw					
		17	9,830	1,474,500	8 lw					
		18	19,500	2,925,000	16 lw					
		19	39,500	5,925,000	32 lw	Oort Cloud				
		20	78,700	11,805,000	1 ly	Oort Cloud				

O= Orbit =

Stars shown physically occupy the orbits shown.

THE 10D GRAVITIC DRIVE LIMIT

	Ia	Ib	II	III	IV	V	VI	D
A0	7	5	4	1	1	0	*	*
A5	7	5	3	1	0	*	*	*
F0	7	6	3	1	0	*	*	*
F5	7	6	4	1	0	*	*	*
G0	8	6	4	1	0	*	*	*
G5	9	7	5	3	0	*	*	*
K0	10	7	6	3	0	*	*	*
K5	10	8	7	5		*	*	*
M0	11	10	8	6		*	*	*
M5	11	11	9	8		*	*	*
M9	12	11	10	8		*	*	*

G-Drives inoperable outside this orbit.

THE 100D JUMP DRIVE LIMIT

	Ia	Ib	II	III	IV	V	VI	D
A0	10	9	7	6	5	5		*
A5	10	9	7	5	4	4		*
F0	11	9	7	5	4	3		*
F5	11	9	7	5	4	3	3	*
G0	11	10	8	6	4	2	2	*
G5	12	10	8	7	4	2	1	*
K0	12	11	9	7	5	2	0	*
K5	13	12	10	9		1	0	*
M0	14	13	11	9		1	0	*
M5	15	14	13	11		0	*	*
M9	15	15	13	12		*	*	*

J-Drives inoperable within this orbit.

THE 1000D MANEUVER DRIVE LIMIT

	Ia	Ib	II	III	IV	V	VI	D
A0	13	12	11	9	9	8		*
A5	14	12	10	9	8	7		*
F0	14	12	10	9	8	7		*
F5	14	12	11	9	8	7	7	*
G0	15	13	11	9	8	6	6	*
G5	15	14	12	10	8	6	5	*
K0	16	14	12	10	8	6	5	*
K5	16	15	13	12		6	5	*
M0	17	16	14	12		5	4	*
M5	18	17	16	14		5	2	*
M9	18	18	16	15		4	1	*

M-Drives inoperable outside this orbit.

Limit shown is beyond (within for Jump) the Orbit Number shown. ***** = inside Orbit 0. Blank = Not possible.

Orbital Distances

Orbits are standardized on the traditional Titus-Bode Relation distances primarily for ease of use.

Orbits

5a ORBITAL DISTANCES

Surface of Star is just inside this Orbit

	S=	O=	AU	Million km	Light-		Sub Orbits	Ia	Ib	II	III
Inner System	10	0	0.2	30	100 ls		no			A0-F5	A0-K0
		1	0.4	60	200 ls	Mercury	no		A0	G0-G5	K5
		2	0.7	105	350 ls	Venus	0		A5-G0	K0	M0
	11	3	1	150	8 lm	Terra	0				
		4	1.6	240	13 lm	Mars	0-1	A0-F5	G5	K5	
	12	5	2.8	420	30 lm	Asteroid Belt	0-2	G0	K0	M0	M5
Outer System		6	5.2	780	43 lm	Jupiter	0-3	G5-K0	K5	M5	M9
		7	10	1,500	83 lm	Saturn	0-4	K5	M0	M9	
		8	20	3,000	3 lh	Uranus	0-5	M0	M5-M9		
		9	40	6,000	5 lh	Neptune	0-6	M5-M9			
		10	77	11,550	10 lh	Kuiper Belt	0-7				
		11	154	23,100	21 lh	Kuiper Belt	0-8				
		12	308	46,200	42 lh		0-9				
Remote System		13	615	92,250	3 ld		0-10				
		14	1,230	184,500	7 ld		0-11				
		15	2,458	368,700	14 ld		0-12				
		16	4,916	737,400	4 lw		0-13				
		17	9,830	1,474,500	8 lw		0-14				
		18	19,500	2,925,000	16 lw		0-15				
		19	39,500	5,925,000	32 lw	Oort Cloud	0-16				
		20	78,700	11,805,000	1 ly	Oort Cloud					

O= Orbit No.

ls= light-second
lh= light hour
lw= light week.
lm= light minute.
ld= light-day

Stars shown physically occupy the orbits shown.

THE 10D GRAVITIC DRIVE LIMIT

	Ia	Ib	II	III	IV	V	VI	D
A0	7	5	4	1	1	0	*	*
A5	7	5	3	1	0	*	*	*
F0	7	6	3	1	0	*	*	*
F5	7	6	4	1	0	*	*	*
G0	8	6	4	1	0	*	*	*
G5	9	7	5	3	0	*	*	*
K0	10	7	6	3	0	*	*	*
K5	10	8	7	5		*	*	*
M0	11	10	8	6		*	*	*
M5	11	11	9	8		*	*	*
M9	12	11	10	8		*	*	*

G-Drives inoperable outside this orbit.

THE 100D JUMP DRIVE LIMIT

	Ia	Ib	II	III	IV	V	VI	D
A0	10	9	7	6	5	5		*
A5	10	9	7	5	4	4		*
F0	11	9	7	5	4	3		*
F5	11	9	7	5	4	3	3	*
G0	11	10	8	6	4	2	2	*
G5	12	10	8	7	4	2	1	*
K0	12	11	9	7	5	2	0	*
K5	13	12	10	9		1	0	*
M0	14	13	11	9		1	0	*
M5	15	14	13	11		0	*	*
M9	15	15	13	12		*	*	*

J-Drives inoperable within this orbit.

THE 1000D MANEUVER DRIVE LIMIT

	Ia	Ib	II	III	IV	V	VI	D
A0	13	12	11	9	9	8		*
A5	14	12	10	9	8	7		*
F0	14	12	10	9	8	7		*
F5	14	12	11	9	8	7	7	*
G0	15	13	11	9	8	6	6	*
G5	15	14	12	10	8	6	5	*
K0	16	14	12	10	8	6	5	*
K5	16	15	13	12		6	5	*
M0	17	16	14	12		5	4	*
M5	18	17	16	14		5	2	*
M9	18	18	16	15		4	1	*

M-Drives inoperable outside this orbit.

Limit shown is beyond (within for Jump) the Orbit Number shown. * = inside Orbit 0. Blank = Not possible.

Orbital Distances

Orbits are standardized on the traditional Titus-Bode Relation distances primarily for ease of use.

HZ

5b HABITABLE ZONES

Habitable Zones for Stars of the Spectral Type and Size Shown.

	S=	O=	AU	Million km	Light-	Ia	Ib	II	III	IV	V	VI	D
Inner System	10	0	0.2	30	100 ls						K9-M9	K4-M9	A0-M9
		1	0.4	60	200 ls							G9-K3	
		2	0.7	105	350 ls						G9-K8	G2-G8	
	11	3	1	150	8 lm						G2-G8	F2-G1	
		4	1.6	240	13 lm						F7-G1		
	12	5	2.8	420	30 lm					F7-K3	F2-F6		
Outer System		6	5.2	780	43 lm				F2-G8	A9-F6	A9-F1		
		7	10	1,500	83 lm				G9-K8*	A0-A8	A0-A8		
		8	20	3,000	3 lh			A9-K3	K9-M8*				
		9	40	6,000	5 lh			K4-M3*	M9				
		10	77	11,550	10 lh		A9-M3	M4-M8					
		11	154	23,100	21 lh	F7-G1	M4-M9*	M9					
		12	308	46,200	42 lh	G2-M9*							

Orbit No.

***Complexities:** Size Ia Orbit 12 also includes A0-F6.
Size Ib Orbit 11 also includes A0-A8.
Size II Orbit 9 also includes A0-A8.
Size III Orbit 7 also includes A9-F1.
Size III Orbit 8 also includes A0-A8.

5c SATELLITE ORBITS-1

	S=	O=	Multiplier	
Locked to the Primary	3	Ay	1	Ring System
	4	Bee	2	Ring System
		Cee	3	Ring System
		Dee	4	
		Ee	5	
		Eff	6	
	5	Gee	8	
		Aitch	10	
		Eye	20	
		Jay	30	
		Kay	40	
	6	Ell	50	
		Em	60	

5c SATELLITE ORBITS-2

	S=	O=	Multiplier
Not Locked		En	70
		Oh	80
		Pee	100
	7	Que	150
		Arr	200
		Ess	250
		Tee	300
		Yu	400
	8	Vee	500
		Dub	600
		Ex	700
	9	Wye	800
		Zee	1000

S= is an approximation. Calculate Orbit radius for a definitive S=.

Satellite Orbit radius varies with the gas giant or planet. Calculate Satellite Orbit Radius = Multiplier (GG x or World x) times Primary World Size (use Ehex) for a result in thousands of km.

For example, Luna is orbit Ell around Terra. Terra is World Size 8. Luna orbits Terra at 50 x 8 = 400 thousand km. Titan is orbit Ell around Saturn. Saturn is World Size = S (Ehex = 26). Titan orbits Saturn at 50 x 26 = 1,300 thousand km.

Money

The standard by which the value of objects and labor is measured is called Money. The varied systems of money in use across the universe allow individuals to buy and sell, to accumulate wealth, to settle debts, and to acquire objects.

Understanding money allows characters to effectively participate in economic activity.

THE THREE LEVELS OF MONEY

Money is accounted for in three distinct levels, each with its own purpose and level of efficiency.

Cr Credits

The basic personal form of money is the Credit. Prices for most goods are expressed in Credits.

One **Credit** is roughly the value of a short period (a quarter hour) of unskilled labor.

For example, a down-and-out spacer, stranded on a frontier world, does odd jobs for the owner of the Lone Star: he is paid several credits for an hour of work.

Credits are available in several forms: coins, currency, precious, or electrons.

KiloCredits. Credits may be expressed in KCr Kilocredits (which is thouands of Credits).

MCr MegaCredits

The basic corporate form of money is the MegaCredit, equal to one million Credits. Accounting for large scale transactions, construction of starships, or budgeting for corporate operations is best undertaken in MegaCredits.

One **MegaCredit** is roughly the value of one day of operations by a typical business corporation.

For example, the Dnar Corporation on Querion operates a series of distribution warehouses. It has annual sales of about MCr 350, or MCr1 per day.

By extension, Dnar Corp probably buys MCr175 in goods annually and sells them for MCr350. It spends the difference on warehouses, trucks, and employees. If it can keep its expenses down to MCr150, the remainder is an annual profit of MCr25 distributed to its various shareholders.

RU Resource Units (RU or Aryu)

The basic governmental form of money is the Resource Unit. The RU is a relative unit of value useful for comparison of different governments. The RU is also used in accounting by MegaCorporations.

Calculated Using The Ex. The Economic Extension provides the basis for calculating RU for a world.

RU

Resource Units = R * L * I * (5 - B)

If any value = 0, use 1 (to avoid multiplying by zero).

The Economic Extension in WorldGen explains RU.

There is no direct correlation between **Resource Units** and Credits or MegaCredits.

Aryu Means Wealth Beyond Imagining. When characters gather to discuss the schemes of plans, the term “aryu” (as in “an aryu scheme,” or “this is worth aryu.”) means Wealth Beyond Imagining.

BARTER

Barter is direct transactions without the use of money. They directly trade one type of goods for another; each participant acquires the specific goods he wants in a quantity that makes each side equal.

The Frontier Trader’s Ramp

When a trader lands on a frontier world, he can try to barter with the natives using the well-established ramp market technique.

The trader lays out goods he wants to trade: textiles, trinkets, tools, small devices, or other goods he feels will be attractive to the natives.

The natives, in response, lay out goods that they think may be attractive to the trader: woven baskets, carves wood totems, pieces of shiny rock, artifacts, gold nuggets, or whatever they have on hand.

Each side then positions its goods across from goods they want. When each is satisfied with what the other has to offer, they nod, or slap the ground, or otherwise signal acceptance, and the participants gather up their newly acquired goods.

IN KIND

In Kind transactions pay for goods or services with something other than money, often for the convenience of the participants. Scouts, Merchants, Spacers, Soldiers, and Elites are provided housing and meals in addition to their ordinary wages. Such an arrangement is more convenient for both sides: the employer avoids some level of money payment, and also avoids charging the employee for meals or quarters. Both sides have the luxury of avoiding the accounting details.

THE ELEMENTS TRAVELLER IGNORES

Among the elements ignored in the course of play are:

Taxes. It is assumed that taxes on goods and income are paid as part of the price or the paycheck. Perhaps they are an included Valued Added tax or an incorporated sales tax.

Inflation. It is assumed that the rate of inflation is low and constant and that it can be ignored for most purposes.

Benchmark Costs

Benchmark costs provide a standard against which players and referees can understand the value of money in **Traveller**.

Benchmark
Costs

THE COSTS OF LIVING

Person		Annual	Month	=30% Housing	=40% Meals	=15% Support	=15% Leisure
Poor Person	Soc = 2	2400	200	60	80	30	30
Average Person	Soc = 7	8400	700	210	280	105	105
Rich Person	Soc = C	14400	1200	360	480	180	180

Each Additional Adult plus 75%.
Each Additional Child plus 50%.
If C6= Charisma, use Charisma.
If C6= Caste, use Caste/2.

Basic Formula: Cost of Living = Soc * Cr100 per month.

SALARIES

Occupation	Monthly Salary	Annual Salary
Citizen	250* Terms	3000* Terms
Scholar (no rank/ part time)	100	1200
Scholar	400* Rank	4800* Rank
Entertainer (ordinary)	25* Fame 1-9.	300* Fame 1- 9.
Entertainer (good)	100* Fame 1-9.	1200* Fame 1- 9.
Entertainer (spectacular)	200* Fame 1-9.	2400* Fame 1- 9.
Entertainer (ordinary)	125* Fame 10-16.	1500* Fame 10-16.
Entertainer (good)	500* Fame 10-16.	6000* Fame 10-16.
Entertainer (spectacular)	2000* Fame 10-16.	24000* Fame 10-16.
Entertainer (ordinary)	250* Fame 17+.	3000* Fame 17+.
Entertainer (good)	1000* Fame 17+.	12000* Fame 17+.
Entertainer (spectacular)	4000* Fame 17+.	48000* Fame 17+.
Scout	200* Term	2400* Term
Merchant (no rank)	100	1200
Merchant Officer	100* Rank	1200* Rank
Spacer	100* Rank	1200* Rank
Spacer Officer	200* Rank	2400* Rank
Soldier	100* Rank	1200* Rank
Soldier Officer	200* Rank	2400* Rank
Elite	200* Rank	2400* Rank
Elite Officer	400* Rank	4800* Rank
Functionary	500* Term	6000* Term

Term is the number of terms spent in the career.

Housing and meals are provided at no cost for Scout, Merchant, Spacer, Soldier, and Elite.

For Entertainers, ordinary/good/spectacular = quality of performance.

WAGES

Skill Level	Annual	Month	Hour
Unskilled Skill 0-1	8,400	700	Cr 4
Novice Skill 1-3	12,600	1050	Cr 6
Competent Skill 3-5	21,000	1750	Cr10
Master Skill 5+	29.400	2450	Cr14

Wages are based on 40 hours per week. 2000 hours per year. 175 hours per month.

Rich World: Increase by 20%.

Poor World: Decrease by 20%.

Industrial World: Increase by 40% (as overtime pay [2 hours per day]).

Professionals: Advocate, Medical, Counsellor earn double the stated rate.

Craftsman: Also earn Cr2 per level of Craftman.

Hellworld (if not a Mainworld): Pay is doubled for a one-year contract.

LAND GRANTS

An unimproved Land Grant generates income based on the Trade Classifications of the world and equal to Cr10,000 per TC annually (Cr5,000 if there are no TCs).

NOBLE LAND GRANTS

Noble Rank	Soc	Hexes	Non-MW	Where?	Preferred World
Gentleman	A		1	any	any
Knight	B	1	1	homeworld.	any
Baronet	c	2	2	one system	Pre-Ag or Pre-Ri
Baron	C	4	4	one system.	Ag or Ri
Marquis	D	8	8	one subsector	Pre-Ind
Viscount	e	16	16	one subsector	Pre-Hi
Count	E	32	32	one sector	Hi
Duke	F	64	64	one sector	any
Duke	F	128	128	one sector	any
Archduke	G	256	256	one domain	any

Nobles receive Land Grants on the worlds on which they hold fiefs.

Each Hex generates a profit equal to Cr10,000 per Trade Classification per year. A Hex with no TC generates Cr5,000 annually.

Noble Land Grants are cumulative. Each title confers its own Land Grant.

The first hex in any grant is on the noble's homeworld. All subsequent hexes are randomly allocated. For each hex on a mainworld, a noble is also granted one hex on a non-mainworld in the same system.

MERCHANT PROFIT SHARING

Merchant ships maintain profit sharing for their officer crew. The Plan consists of a total of 20 shares. Each crew officer receives one share per level of Rank.

4th Officer	= 1 share.
3rd Officer	= 2 shares.
2nd Officer	= 3 shares.
1st Officer	= 4 shares.
Captain	= 5 shares.

The pool receives 10% of the profits of the ship's operations.

Annual Payouts. Shares are paid out annually before annual maintenance.

Value, Cost, and Price

Every object has a value, a price, and a cost. It is important to be able to differentiate between the three concepts.

Value

THE WORTH OF THINGS

An object has a value to an individual based on how the object is. Value is defined in money terms, but often evaluated in other than money (a treasured picture of a parent may be worth a great deal to a son, and nothing at all to a stranger).

Cost refers to production. A manufacturer who creates an object encounters a cost in money based on the elements put into the object, the labor required, and a suitable allowance for overhead.

Price refers to sales. The amount for which an object is sold to the consumer is the price.

Value is relative. Somewhere between an object's cost to make and its sale price is its value.

Buying and Selling is a win-win situation. The Seller wants to sell for more than his cost. The Buyer wants to pay less than (or equal to) an object's value. When a buyer and seller make a transaction, both can win.

THE VALUE RULE

The table shows Values. A manufacturer or producer can usually make these goods (in quantity) paying less than Value. A buyer can usually buy these goods individually for Value or slightly more.

> Benchmark										
Typical		Snack	Meal	Clothes	Device	Major Part	ATV	Small Craft	Starship	Large Starship
Salary			1 hr		1 mo	1 yr				
Value		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Credits		<1	10	100	1,000	10,000	100,000	MCr1	MCr10	MCr100

VALUES FOR OBJECTS

Values are coded as orders of magnitude and help in estimating object costs and prices through simple logic.

Base Value. Base Value is a very rough indication of the worth of an object.

A good meal is worth about Cr10. A cook could pay a grocery cost of Cr5, prepare a meal, and price it at Cr10.

Cost Modifications

The cost (manufacturing cost, production cost, wholesale cost) is a fraction of the Base Value taking into account volume production, production difficulty, resource availability, and technology.

Volume Production. An enterprise can manufacture a quantity of objects at a cost less than their final value.

Very Efficient Production Cost	= Value / 10
Mass Production Cost	= Value / 5
Small Manufacturer 100 item Cost	= Value / 3
Individual Assembler 20 Item Cost	= Value / 2

Price Modifications

The price for an object may be influenced by Supply and Demand.

Price may also be influenced by QREBS

TYPICAL COST MODIFIERS

Flux	Description	Cost	Comment
- 5	Experimental	4.0 x	Before substantial testing.
- 4	Prototype	3.0 x	Handmade sample.
- 3	Early	1.2 x	Preliminary.
- 2	Basic	0.7 x	Elementary. Unenhanced.
- 1	Standard	1.0 x	Normal. Ordinary.
0	(blank)	1.0 x	Normal. Ordinary.
+1	Alternate	1.1 x	Nonstandard performance
+2	Modified	1.2 x	Changed, New features.
+3	Improved	1.1 x	Updated.
+4	Advanced	2.0 x	Multiple new features.
+5	Obsolete	0.5 x	Out of date.

PRICE MODIFICATIONS

Flux	Supply	Mod	Demand	Mod
-5	Ubiquitous	0.5 x	Very Low	0.5 x
-4	Abundant	0.6 x	Quite Low	0.6 x
-3	Very Common	0.7 x	Low	0.7 x
-2	Quite Common	0.8 x	Weak	0.8 x
-1	Common	0.9 x	Less Ordinary	0.9 x
0	Typical		Ordinary	1.0 x
1	Uncommon	1.2 x	Good	1.2 x
2	Scarce	1.4 x	Strong	1.4 x
3	Rare	1.6 x	High	1.6 x
4	Quite Rare	1.8 x	Quite High	1.8 x
5	Very Rare	2.0 x	Very High	2.0 x

Price Modification can be used in two different ways:

Ordinary Objects. Roll for Demand only.

Special Objects. Roll for both Supply and Demand and combine them.

Object Size

Objects can be identified with specific dimensions, but for many, it is more convenient to describe them with a Size: a general description of its bulk or volume. Size corresponds to the Benchmark objects used with the Senses and with Sensors.

Size

UNDERSTANDING SIZE

Size indicates the approximate size or dimensions of an object.

The chart shows the basic benchmark sizes. For example, the referee may say,

"You see a Person-Size something in the distance."
"You see a Size-5 object on the starport tarmac."
"Sensors pick up a Missile-Size object at separating from that ship."

Size covers a broad descriptive range, and includes some overlap. Person-Size may indicate anything larger than a suitcase and smaller than a truck. Suitcase may indicate anything larger than a book and smaller than a person.

Sizes can be decimal. An object slightly smaller than Size-6 is Size 5.9; a slightly larger object is Size 6.1.

Carrying and Using. A Size-N sophont can typically carry and use any object less than its own Size. For example, a Size 5 Sophont can carry and use a Size 4 Object. A Size-6 truck can carry many Size-5 objects.

Size and World Range (or Distance) are related. A person with ordinary vision usually see an object of Size-N or larger at Range-N or less.

SIZES AT WORLD RANGES

> Benchmark										
		Wire	Word	Bullet	Card	Book	Suitcase	Person	Truck	Tower
Size		1 mm thin	2 mm 10 point	7 mm 0.3 inch	75 mm 3 inches	200 mm 8 inches	750 mm 30 inches	1.5 m 5 feet	7.5 m 25 feet	75 m 250 feet
Size	**0**	**R**	**T**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Distance	Contact	.5m	1.5m	5m	50m	150m	500m	1000m	5km	50km
Weapon			Serial No.	Bullet	Snub	Pistol	Rifle	Person	Vehicle	
Vehicle		Crack	Seam	Bolt				Person	Truck	SC
Device		Wire					Fusion+	Person		

Size= approximately the width of 5 minutes of angle at the range shown.

DECIMAL SIZES

Length			1.0 mm	2.0 mm	7 mm	7.5 cm	20 cm	7.5 m	1.5 m	7.5 m	75 m
1	.1	.1 mm	1.1 mm	2.5 mm	8 mm	8 cm	25 cm	.8 m	1.6 m	8 m	80 m
2	.2	.2 mm	1.2 mm	3.0 mm	9 mm	9 cm	30 cm	.9 m	1.7 m	9 m	90 m
3	.3	.3 mm	1.3 mm	3.5 mm	10 mm	10 cm	35 cm	1.0 m	1.8 m	10 m	100 m
4	.4	.4 mm	1.4 mm	4.0 mm	11 mm	11 cm	40 cm	1.1 m	1.9 m	11 m	110 m
5	.5	.5 mm	1.5 mm	4.5 mm	45 mm	15 cm	45 cm	1.0 m	2.0 m	45 m	450 m
6	.6	.6 mm	1.6 mm	5.0 mm	50 mm	16 cm	50 cm	1.1 m	5.0 m	50 m	500 m
7	.7	.7 mm	1.7 mm	5.5 mm	55 mm	17 cm	55 cm	1.2 m	5.5 m	55 m	550 m
8	.8	.8 mm	1.8 mm	6.0 mm	60 mm	18 cm	60 cm	1.3 m	6.0 m	60 m	600 m
9	.9	.9 mm	1.9 mm	6.5 mm	65 mm	19 cm	65 cm	1.4 m	6.5 m	65 m	650 m

HOW BIG IS IT REALLY?

Roll Flux to randomly generate an object size.

Flux	x	R= **0**	**R**	**T**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
-5	0.5	--	0.5 mm	1.0 mm	2 mm	20 mm	10 cm	20 cm	1.0 m	3 m	20 m
-4	0.6	--	0.6 mm	1.2 mm	3 mm	30 mm	12 cm	30 cm	1.1 m	4 m	30 m
-3	0.7	--	0.7 mm	1.4 mm	4 mm	40 mm	14 cm	40 cm	1.2 m	5 m	40 m
-2	0.8	--	0.8 mm	1.6 mm	5 mm	50 mm	16 cm	50 cm	1.3 m	6 m	50 m
-1	0.9	--	0.9 mm	1.8 mm	6 mm	60 mm	18 cm	60 cm	1.4 m	7 m	60 m
0	**1.0**		**1.0 mm**	**2.0 mm**	**7 mm**	**75 mm**	**20 cm**	**75 cm**	**1.5 m**	**7.5 m**	**75 m**
+1	1.2	0.1 mm	1.2 mm	2.4 mm	8 mm	80 mm	30 cm	80 cm	2 m	10 m	80 m
+2	1.4	0.2 mm	1.4 mm	2.8 mm	9 mm	90 mm	40 cm	90 cm	3 m	20 m	90 m
+3	1.6	0.4 mm	1.6 mm	3.2 mm	10 mm	100 mm	50 cm	100 cm	4 m	30 m	100 m
+4	1.9	0.6 mm	1.8 mm	3.8 mm	11 mm	120 mm	60 cm	120 cm	5 m	40 m	110 m
+5	2.0	0.8 mm	1.9 mm	4.0 mm	12 mm	150 mm	70 cm	150 cm	6 m	50 m	120 m

Hot and Cold Benchmarks

Hot and Cold Impact

Na HOT AND COLD BENCHMARKS — In D

K	C	Hits		Descriptor
0	**-273**	**144**		Absolute Zero
25	**-250**	**121**		Hydrogen Ice
50	**-225**	**100**		Oxygen Ice
75	-200	**81**		Nitrogen Ice
100	-175	**64**		
125	-150	**49**	Cold	
150	-125	**36**		
175	-100	**25**		
200	-75	**16**		Radon Ice
225	-50	**9**		
250	-25	**4**		
275	0	**1**		Cold
300	25	**0**		Human Temperate
325	50	**1**		Hot
350	75	**4**		
375	100	**9**		Boiling Water
400	125	**16**		Sulfur melts
425	150	**25**		
450	175	**36**	Hot	
475	200	**49**		
500	225	**64**		Tin melts
525	250	**81**		Fire
550	275	**100**		
575	300	**121**		
675	400	**225**		
775	500	**361**		
875	600	**529**		
975	700	**729**		
1075	800	**961**		
1175	900	**1225**		
1275	1000	**1521**		
1375	1100	**1849**		
1475	1200	**2209**		
1875	1500	**3481**		

Hits per Round (= 1 minute)
Hits calculated based on (K= Kelvins):

Hits = ((K / 25) / 12) ^2

Nb IMPACT DAMAGE — In D

Speed	kph	Hits	Descriptor	Alt Descriptor
0	0	**0**	Still	Not Moving
1	5	**1**	Creep	Walking
2	10	**4**	Crawl	Running
3	20	**9**	Xslow	
4	30	**16**	Vslow	Sprint 100 m
5	50	**25**	Slow	Gallop (horse)
6	100	**36**	Standard	
7	300	**49**	Cruise	
8	500	**64**	Fast	
9	700	**81**	Vfast	
10	1000	**100**	Sonic	
11	2000	**121**	Supersonic	
12	3000	**144**	Hypersonic	
13	5000	**169**		
14	10000	**196**		
15	20000	**225**		
16	40000	**256**	Meteoric	
17		**289**		
18		**324**		
19		**361**		
20		**400**		

Hits upon impact.
Hits calculated based on (S= Speed):

Hits = S^2

Multiply by tons (or fractional Tons) of impacting object.
Space Combat uses Size instead of Tons.

INSULATION PROTECTION RANGES

In=	usually protects against			for absolute protection
510	-275	to	325	In= 810
430	-250	to	300	In= 730
360	-225	to	275	In= 610
290	-200	to	250	In= 490
230	-175	to	225	In= 390
180	-150	to	200	In= 300
130	-125	to	175	In= 220
90	-100	to	150	In= 160
60	-75	to	125	In= 100
40	-50	to	100	In= 60
20	-25	to	75	In= 30
10	0	to	50	In= 10

For Cold Protection, an On-Board Heater increases the Cold Protected temperature - 100 C.

Characteristics Establish A Foundation

The physical, mental, and social abilities for Characters are described and defined by Characteristics. These Characteristics are gathered into a six-digit string for easy reference.

Characteristics are foundations for physical, mental, and social activity. Each character has three physical characteristics, two mental characteristics, and one social characteristic (plus an obscure characteristic called Sanity).

Characteristics are Assets in the resolution of Tasks. The characteristics establish the foundation for the resolution of most tasks. A character with a specific skill can attempt tasks that someone without skill is not permitted to try.

CHARACTERISTICS FOR SOPHONTS

Traveller uses fourteen different Characteristics, of which a character uses six. The specific six are determined by the character's race.

Human Characteristics: The six human characteristics are Strength, Dexterity, Endurance, Intelligence, Education, and Social Standing.

Referring To Characteristics

Each characteristic has a name and several ways of identifying it.

Abbreviations. A Characteristic can be abbreviated with its first three letters. Capitalize only the initial letter of the abbreviation. For example, Strength is Str (rather than STR).

Genetic Profile (GP). A Characteristic can use its initial letter in the Genetic Profile.

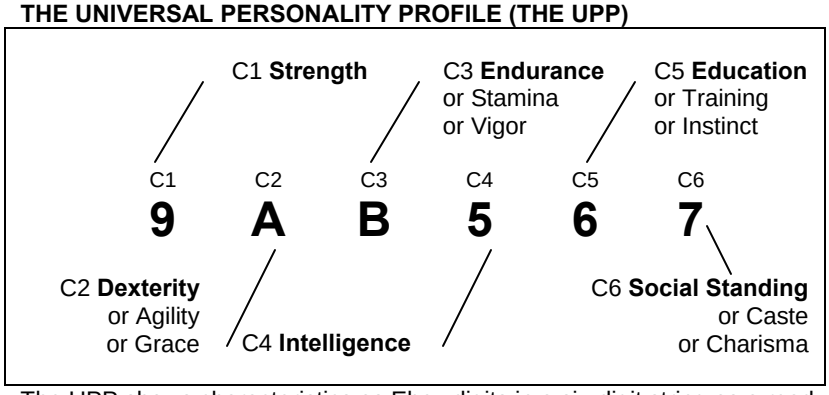
The GP is a six-letter string (using the initial letters of the characteristics) showing the specific six characteristics for a sophont. For example, the Human GP = SDEIES (Str, Dex, End, Int, Ed, Soc). There is a sophont with GP = SASIIK (Str, Agi, Sta, Int, Ins, Cas).

The meaning of letters in the GP is dependent on position (S in position 1 is Strength, S in position 3 is Stamina). Because two characteristics in position 6 have the initial letter C, use K for Caste.

Position Codes (C1 C2 C3 C4 C5 C6). A characteristic can be identified by its position in the UPP. Use the letter C (for Characteristic) followed by 1 through 6. For example, for all sophonts, C1 = Str.

To avoid confusion between a word's ordinary meaning and its use as a characteristic name (such as Strength and strength), a characteristic may be explicitly referred to in the format Position Code = Characteristic Name. For example, C5 = Training, or C4 = Intelligence.

THE UNIVERSAL PERSONALITY PROFILE (THE UPP)



The UPP shows characteristics as Ehex digits in a six-digit string as a ready reference for the abilities of the character. **Bold** = Human.

CHARACTERISTICS

Possible personal characteristics include:

Char	Abb	Characteristic	H*	Description	GP Letter
C1	Str	**Strength**	H	physical power and ability.	S
C2	Dex	**Dexterity**	H	body and eye-hand coordination.	D
C2	Agi	Agility	A	overall body coordination.	A
C2	Gra	Grace	A	overall body-limb coordination.	G
C3	End	**Endurance**	H	physical resistance to fatigue.	E
C3	Sta	Stamina	A	long-term ability to pursue a task.	S
C3	Vig	Vigor	A	short-term ability to resist fatigue.	V
C4	Int	**Intelligence**	H	natural ability to think and reason.	I
C5	Edu	**Education**	H	achievement level of schooling	E
C5	Tra	Training	A	based on cultural heritage	T
C5	Ins	Instinct	A	based on genetic heritage.	I
C6	Soc	**Social Standing**	H	position in large group hierarchy.	S
C6	Cha	Charisma	A	position in small group hierarchy.	C
C6	Cas	Caste	A	position in genetic group hierarchy.	K

H= Human characteristic (may be in non-humans). If all characteristics are H, the species may be (but is not necessarily) Human. In **Bold.**

A= Analog (non-human) characteristic.

Characteristic Equivalences

Analog characteristics can be related to each other and can often be substituted for each other in tasks and other situations.

For example, the C2 characteristics Dexterity, Grace, and Agility substitute for each other at half value. A sophont with Grace attempting a task for Dexterity would use half-Grace. A character required to use an analog Characteristic is almost always working at a disadvantage.

CHECK CHARACTERISTIC

Easy Check	**1D =< Characteristic**
Check	**2D =< Characteristic**
Hard Check	**3D =< Characteristic**

Characteristics provide a simple mechanism (the Check <Characteristic>) for resolving situations:

The Check. Select an appropriate Characteristic and roll 2D against that characteristic: a result equal to or less than the characteristic gives success; any other result gives failure.

To avoid recurring use of a character's high characteristic, a character cannot use a characteristic again until two other characteristics have been used. If only one specific Characteristic is appropriate; each successive use of the Characteristic rolls with Mod -1.

Easy Checks and Hard Checks. For very easy tasks, roll 1D; for very hard tasks, roll 3D.

For example, Aia Resteff 68A999 is loading cargo on a Free Trader. One especially large container is blocking a floor access panel. She puts her shoulder to the load and tries to move it. The Referee says Check-Strength. The player rolls 2D (=7 which is greater than Aia's Strength-6; it fails). She can't try again immediately, so instead of pushing, she tries rocking the container. The Referee says Check Dexterity. The player rolls 2D (=7, which is less than Dexterity-8; the container moves).

Mods. The Check can be enhanced (or degraded) by circumstantial Mods. For example, Check Str - Weather, or Check Dexterity - Slippery Surface.

PHYSICAL VS. MENTAL VS. SOCIAL

Characteristics may be **Physical**, **Mental**, or **Social**. Each character has three Physical characteristics, two Mental Characteristics, and one Social Characteristic.

Physical Characteristics C1, C2 and C3

The physical characteristics are Strength, Dexterity, Endurance, Grace, Agility, Stamina, and Vigor.

All characters have Strength.

There are three different characteristics for fine physical activity: Dexterity (for humans), Agility, and Grace. Each represents a slightly different physical approach.

There are three different characteristics for resistance to fatigue: Endurance (for humans), Stamina, and Vigor. Each represents a slightly different ability.

Mental Characteristics C4 and C5

The mental characteristics are Intelligence, Education, Instinct, and Training.

All sophonts have Intelligence.

There are three different characteristics for learning: Education (for Humans), Training, and Instinct.

Social Characteristics C6

The social characteristics are Social Standing, Charisma, and Caste.

There are three different characteristics for position in social hierarchy: Social Standing (for Humans), Charisma, and Caste.

The Obscure Characteristics CS and CP (or CΨ)

There are two obscure characteristics: Sanity and Psionics.

Every character has both Sanity and Psionics, although they are not generated until needed.

Why Different Characteristics?

The different characteristics allow players to create sophonts with slightly (or not-so-slightly) different abilities. When a character is called upon to use a characteristic which he does not have; he can use the analog he does have at half value (usually; there are some exceptions).

For example, a character with Dexterity has to do a task with Agility: he can use his Dexterity at half value (round fractions up).

C1 STRENGTH

Strength (abbreviated Str). Strength is physical power and ability. Strength is the ability to apply physical force or to carry loads (loads for strength are expressed in kilograms).

Every character has Strength.

Using C1

Strength is the characteristic that governs Load and Burden.

Load And Burden. Load is the weight (technically it is the mass) of all objects carried by person. **Burden** is the perceived load after all modifications. If Burden does not exceed Str in kg, there is no penalty.

Burden (in the QREBS system) may modify the effective weight or mass of some objects (devices, equipment, weapons). The QREBS Burden modifier may increase or decrease load. Thus the Burden modifier creates Burden by increasing or decreasing Load.

Carrying. A character can routinely **carry** a Burden equal to Strength in kilograms for an unlimited period of time. He can carry a double Burden but functions with C2 minus 2 and C3 minus 2 until the Burden is shed. He can carry a triple Burden but functions with C2 minus 4 and C3 minus 4 until the Burden is shed.

Transferring. Transfer is the temporary movement of a Burden from one place to another (often a process of lift, walk a short distance, and drop). A character can **transfer** a Burden of 5x Strength. Transfer is limited to C3 in minutes every hour for Endurance, every half hour for Stamina, and every two hours for Vigor.

Lifting. A character can **lift** a Burden of 10x Strength for under one minute.

Dragging. A character can **drag** a load of 20x Strength for under one minute.

C2 DEXTERITY OR AGILITY OR GRACE

C2 is the characteristic which addresses fine physical activity.

Dexterity (abbreviated Dex). Dexterity is body and eye-hand coordination, or fine touch control.

Agility (abbreviated Agi). Agility is overall body coordination. Agility is often (but not exclusively) associated with flyers.

Grace (abbreviated Gra). Grace is overall body-limb coordination. Grace is often (but not exclusively) associated with swimmers.

C2	If The Task Calls For	
Dexterity	**Agility**	**Grace**
Use Dex x 1	Use Dex / 2	Use Dex / 2
Use Agi / 2	Use Agi x 1	Use Agi / 2
Use Gra / 2	Use Gra / 2	Use Gra x 1

Using C2

The C2 characteristic is used in balance, accuracy (in throwing or weapons use), and in fine manipulation.

Balance. When a character risks losing his or her balance, Check C2.

Accuracy. When a character throws something at a target, Check C2.

Fine Manipulation. When a character attempts fine manipulation (operating very small controls, inserting detailed parts into a mechanism), Check Dexterity.

C3 ENDURANCE OR STAMINA OR VIGOR

C3 is the characteristic which addresses fatigue and resistance to fatigue.

Endurance (abbreviated End). Endurance is personal determination and physical resistance to fatigue.

Stamina (abbreviated Sta). Stamina is personal determination and long-term ability to pursue a task. Characters with Stamina have greater long-term resistance to fatigue, and are in some ways superior to those with Endurance.

Vigor (abbreviated Vig). Vigor is personal determination and short-term ability to resist fatigue. Vigor is an inferior alternative to Endurance. Characters with Vigor have lower resistance to fatigue.

C3	If The Task Calls For	
Endurance	**Stamina**	**Vigor**
Use End x 1	Use End / 2	Use End x 2
Use Sta x 2	Use Sta x 1	Use Sta x 2
Use Vig / 2	Use Vig / 2	Use Vig x 1

Using C3

The C3 characteristic determines the length and effectiveness of a character's Personal Day, a character's need for sleep, and his ability to perform tasks.

Exhaustion and Fatigue. When a character engages in physically exhaustive work (running a great distance; moving heavy loads), Check C3.

Sprints. For short distance running, Check Vigor.

Long Distance Running. In a continued running situation, Hard Check Endurance.

C4 INTELLIGENCE

Intelligence (abbreviated Int) is the natural mental ability to think, reason, and to use logic.

Every character has Intelligence.

Using C4

The Intelligence characteristic allows a character to be smarter than the player (or less smart than the player). There are times when a **player** has a **character** who is smarter than he is (or a **player** has a **character** who is less intelligent than he is).

Solving Puzzles. When a character is confronted with a puzzle, Check Intelligence. The game master manipulates this basic process to reflect harder puzzles, simpler situations, or other complications.

C5 EDUCATION OR TRAINING OR INSTINCT

C5 is the characteristic which addresses learning and the ability to acquire and use long-term information.

Education (abbreviated Edu). Education is learning based on achievement level of schooling. Education is an equivalent level of schooling (although not necessarily attendance at a school).

Education is also a supplement or an alternative to Intelligence. In **Traveller**, they are decoupled: they are unrelated, and it is possible for a very intelligent person to have a low Education (or a very high Education person to have a low intelligence).

Sophonts with C5 = Education can be taught skills and knowledges in the traditional Educational environment. The governing skill for the Educational environment is Teacher.

Training (abbreviated Tra). Training is learning based on behavior modification. Training is a predisposition to the learning process based on cultural heritage.

Sophonts with C5 = Training learn poorly in the Educational environment; they prosper in special Training courses adapted to their needs. The governing knowledge for the Training environment is Trainer.

Instinct (abbreviated Ins). Instinct is an inborn complex of behaviors comparable to acquired learning. It is based on genetic heritage.

Sophonts with C5 = Instinct function poorly in the Education or Training environment and cannot use those institutions (they increase skills through experience).

C5	If The Task Calls For	
Education	**Training**	**Instinct**
Use Edu x 1	Use Edu / 2	Use Edu =4
Use Tra / 2	Use Tra x 1	Use Tra =4
Use Ins = 4	Use Ins = 4	Use Ins x 1

Using C5

The C5 characteristic indicates the sum of an individual's abilities available in support of intelligence.

Finding Basic Facts. When a character is confronted with a need for basic facts: Check Education. The game master manipulates this basic process to put the correct information at the disposal of the characters.

Substituting Edu, Tra, and Ins. Training and Education substitute for each other at half value. Ins can be substituted for Edu or Tra with a value of 4. For tasks that require Instinct, Edu or Tra may be used with a value of 4.

Instinctual Reactions. A character with Ins, confronted with a task that requires Edu or Tra reacts instinctively.

For easy tasks, Easy Check Instinct.
For Average tasks, Check Instinct.
For Difficult tasks, Hard Check Instinct.
For tasks beyond Difficult, roll the number of dice for the task.

Instinct provides a time advantage. A character who succeeds in a task using Instinct completes it **before** anyone else attempting the task using Edu or Tra.

Instinctual Skills and Knowledges. Sophonts with C5 = Instinct receive a native store of three instinctual skills or knowledges (but not talents) with a skill level equal to C5 Instinct.

C6 SOCIAL STANDING OR CHARISMA OR CASTE

C6 is the characteristic associated with a character's place in society.

Social Standing (abbreviated Soc) is social position in large group hierarchy. Social Standing indicates social class and the level of society from which the character comes.

Charisma (abbreviated Cha) is position in small group hierarchy. Charisma reflects a relative social relationship between members of a small group. A low Charisma individual will defer to and follow the leadership of a high Charisma individual.

Caste (abbreviated Cas) is position in genetic group hierarchy.

C6	If The Task Calls For	
Social	**Charisma**	**Caste**
Use Soc x 1	Use Soc x 2	Soc not used
Use Cha / 2	Use Cha x 1	Cha not used
Use Cas = 4	Use Cas = 4	Use Cas x 1

Using C6

The C6 characteristic governs social interactions.

Bluff. When conducting a plausible bluff (getting past a guard; convincing a clerk) in general society. Check Social Standing. If the target of the bluff has C6= Charisma, Check Charisma.

Living Costs. C6 determines the cost to that individual for basic living. C6 times Cr100 equals the typical cost of monthly support (food, clothes, lodging, basic entertainment). But, if C6= Caste, use half C6.

Nobility. Nobility is the expected noble rank held by an individual based on Social Standing.

Characters with Soc are participants in the widespread social structure of the universe, which includes granted or inherited titles of nobility to those with higher values of Soc. Characters with Cha are at the fringes of the Nobility system: their equivalent Soc equals Cha / 2. Characters with Cas do not participate in the Nobility system; they are culturally or genetically dismissive of such rank, and generally ignore it or seem unaware of it. In the rare event that a character with Cha or Cas receive a Noble rank, it is noted as a skill.

The first step in the Nobility is A = Gentleman (Gentlewoman, Gentleperson, Gentlesophont). Although technically not Noble, Soc = A represents an awakening awareness of the Noble structure and of the potential to be a member of the Nobility.

Baronet and Baron. A character elevated to Soc = C is initially a Baronet. The next increase in Soc remains C but the title increases to Baron.

Viscount and Count. A character elevated to Soc = E is initially a Viscount. The next increase in Soc remains E but the title increases to Count.

The Disruptive Effects of Charisma. Charisma is an alternate to Social Standing. Basically, characters with Charisma squabble and challenge each other in a way that persons with Social Standing do not.

Characters with Cha automatically defer to the leadership of others with higher Cha. Because Cha acknowledges Soc as double Cha, it generally defers to the leadership of others with higher Soc.

A character with Charisma within 2 of another character with Charisma may (but is not required to) challenge the other: if the challenge succeeds, the challenger rises in Cha and the loser has Cha reduced.

To Challenge Charisma.
Difficult (3D) < Characteristic
Opposed (2). Resolves the Challenge in one task.
Challenger selects Characteristic (must be the same for both). Losers reduce Cha by -1. If Challenger is the winner, his Cha increases to opponent's former Cha.

To Rechallenge Charisma.
Difficult (3D) < Characteristic
Opposed (2). Resolves the Rechallenge in one task.
Loser immediately re-challenges, selecting a different Characteristic. Losers reduce Cha by -1. If Challenger is the winner, his former Cha is restored and increased +1.

The Isolative Effects of Caste. Characters with Cas are generally oblivious to the position in the social hierarchy outside their own species. They pay proper attention and deference to those with higher Cas within their species, and generally treat anyone with any value of Soc or Cha as an equal or inferior.

Characters with Caste are socially inept (if one tried a bluff, he uses Check Social Standing with a value of 4 and is unlikely to succeed).

CS SANITY

Every character has an obscure and usually unreferenced characteristic called Sanity. Characters do not generate Sanity until it is first called for by the referee and the situation.

Sanity is the ability to make reasonable, sound use of the mental characteristics. By extension, low levels of sanity express a disconnect between the perceptions of the character and reality.

Universal Structure. All sophonts generate Sanity with 2D.

Recording Sanity. Sanity is not normally indicated in references to a character. When necessary, it is stated independently as CS=N or San=N. The value should be stated in Ehex.

Using CS

Sanity may be reduced when a character is confronted by a crisis. Reductions are permanent, but Sanity may be regained through counseling or with drugs.

Sanity is Reduced by Crises. When characters encounter Crises (battles, extreme stress, environmental situations, psionic attacks, drug interactions, and others), there is the chance that Sanity will be reduced.

Check Sanity. Failure reduces Sanity -1.

Sanity Zero indicates Insanity. When Sanity is reduced to Zero, a character is subject to an automatic Mod (= Flux; rolled new with every use) for every use of Intelligence and

C5= Education or C5 = Training (but not C5 = Instinct) and the task becomes Uncertain (1D).

The Effect of Counselling. Sessions with a Counsellor (generally using Counsellor skill) may increase Sanity.

The Effect of Drugs. Drugs exist which prevent reductions in Sanity. Drugs also exist which may increase Sanity.

Sanity Is Genetic. Record the first Die of San as the genetic D.

CP PSIONICS Rarely: CΨ

Every character has an obscure and usually unreferenced characteristic called Psionics (abbreviated Psi). Characters do not generate Psionics until it is first called for by the referee and the situation.

Psionics is the capability to use Psionic Abilities.

Universal Structure. All sophonts generate Psionics with 2D +3 - Life Stage. A character tested in infancy for Psi rolls 2D +3. Characters are more likely to be tested in adulthood: a human character at age 18 (Life Stage 3) rolls 2D +3 -3.

Recording Psionics. Psionics is not normally indicated in references to a character. When necessary, it is stated independently as CP=N or Psi=N. The value should be stated in Ehex.

Psionics Is Genetic. Record the first Die of Psi as the genetic D.

Using CP

Psionics is an obscure characteristic which remains unknown to the character until it is awakened by a suitable mentor or experience.

WHY ALL THESE DIFFERENT CHARACTERISTICS?

The traditional six characteristics Str Dex End Int Edu Soc were created to reasonably and accurately reflect human characters, and this information was compiled in an easy-to-read Universal Personality Profile. As **Traveller** progressed and evolved, it established alien / non-human / sophont races who had various alternate characteristics. The K'kree established Caste as an alternative to Social Standing. The Vargr established Charisma as an alternative to Social Standing. The Hivers established Curiosity as an alternative to Social Standing (Curiosity has since been transformed into a Personal). **Traveller: The New Era** created evolutionary alternatives to the original characteristics: Agility for Dexterity, Constitution for Stamina; it also provided characters with both Charisma and Social Standing.

Traveller5's treatment of characteristics establishes a range of logical physical, mental, and social characteristics and makes them compatible with each other. The basic scheme is this:

Humans continue to have their traditional characteristics: Strength, Dexterity, Endurance, Intelligence, Education, and Social Standing (plus Sanity). It is possible for a non-human to have the same characteristics as a human. It is also possible for non-humans to have alternate characteristics to reflect differences in the physical, mental, and social makeup of the aliens.

For example, a sophont may have Grace instead of Dexterity. The basic task to use a pistol calls for Dexterity; the sophont resolving the task must use Grace (at half value) and has a lesser chance of succeeding. There are steps that the alien can take to help: be cautious; acquire more skill; use a pistol with a high Ease-Of-Use. But in general, the alien is at a disadvantage attempting the task.

Continuing this example, Grace is the controlling characteristic for Swimming. The sophont uses Grace at full value in Swimming tasks; a human performing the same task is forced to use Dexterity (at half value) and has a lesser chance of success when compared to the sophont.

What Does This Mean?

Analog characteristics support three concepts in **Traveller:**

Interstellar society is human-dominated. The characteristics most often used in common tasks are the ones humans have; sophonts with the alternate characteristics are at a disadvantage trying most of the tasks available in interstellar society.

The challenges of the universe are met by many different abilities. There are situational advantages to the alternate characteristics. Sometimes, the best characteristic is a non-human one; the right person in the right place has an advantage.

The universe is a rich decision making environment. Many choices and many alternatives give both the players and the referee an opportunity to choose between them, which make for more interesting and more exciting adventures.

Mental / Social Characteristics

The Mental Characteristics relate to a character's ability to process information about the world. The Social Characteristic relates to the character's ability to interact in society.

Char-02

C4 Int
C5 Edu Tra Ins
C6 Soc Cha Cas

INTELLIGENCE C4

Int	Equivalent
0	Non-Functioning
1	Very Low
2	Quite Low
3	Low
4	Unimaginative
5	Below Average.
6	Average.
7	Average.
8	Average.
9	Above Average.
A	Superior.
B	Gifted.
C	Very Gifted.
D	Genius.
E	Extraordinary
F	Superhuman

Intelligence is the natural mental ability to think, reason, and to use logic.

USING INTELLIGENCE

When a character is confronted with a puzzle, the throw to solve it is Int or less. The game master manipulates this basic process to reflect harder puzzles, simpler situations, or other complications.

SANITY CS

San	Equivalent
0	Non-Functioning
1	Borderline
2	Vulnerable
3	Weak
4	At Risk
5	Sane
6	Sane
7	Sane
8	Sane
9	Sane
A	Sane
B	Sane
C	Sane

Sanity is the ability to make reasonable, sound use of mental characteristics.

EDUCATION C5

Edu	Equivalent
0	Absent.
1	Illiterate.
2	Basic Reading.
3	Grade School.
4	Dropout.
5	High School.
6	Some College
7	Associate
8	Bachelor
9	Master
A	Advanced Work
B	Researcher
C	Doctorate
D	Expert
E	An Authority
F	The Authority

Education is level of schooling (but not necessarily school attendance).

USING EDUCATION

When it is unclear which characteristic (Int or Edu) governs, the game master may declare which one (or either) may be used to resolve the puzzle.

A typical blend is designating one characteristic and applying the other at half as a Mod

For example,
Int + Edu/2,
Edu + Int/2.

SUBSTITUTING C5

Training and Education can be substituted for each other at full value. Ins cannot be substituted for either. For those rare tasks that require Instinct directly, Edu or Tra may be used with a value of 1.

TRAINING C5

Tra	Equivalent
0	Genetically Faulty
1	Untrainable
2	Very Slow
3	Slow
4	Slow
5	Below Average
6	Below Average
7	Average
8	Average
9	Average
A	Above Average
B	Above Average
C	Resourceful
D	Quite Resourceful
E	Adept
F	Very Adept

Training is the ability (based on cultural heritage) to use knowledge.

INSTINCT C5

Ins	Equivalent
0	Genetically Faulty
1	Incapable
2	Very Slow
3	Slow
4	Slow
5	Below Average
6	Below Average
7	Average
8	Average
9	Average
A	Above Average
B	Above Average
C	Resourceful
D	Quite Resourceful
E	Adept
F	Very Adept

Instinct is the ability (based on genetic heritage) to acquire and use knowledge.

A character with Ins, confronted with a task that requires Edu or Tra reacts instinctually.

Check Ins. Success also completes the task **before** anyone else.

SOCIAL STANDING

Soc	Equivalent
0	Social Outcaste
1	Social Misfit
2	Dregs of Society
3	Lower Low Class
4	Middle Low Class
5	Upper Low Class
6	Low Middle Class
7	Middle Class
8	Upper Middle
9	Low Upper Class
A	Middle Upper
B	Upper Upper
C	Remarkable
D	Extraordinary
E	Extreme
F	Supreme

Social Standing indicates social class or social level for the character.

SUPPORT

C6 determines the cost to an individual for basic living.

Typical cost of monthly support (food, clothes, lodging, basic entertainment)=

Cr100 x Soc
Cr100 x Cha
Cr100 x Cas / 2.

NOBILITY C6

Soc	Equivalent
A	Gentleman
B	Knight
c	Baronet
C	Baron
D	Marquis
e	Viscount
E	Count.
F	Duke.
G	Archduke
H	Emperor

Nobility is the expected or equivalent (although not necessarily actual) noble rank held by an individual based on Social Standing.

CHARISMA C6

Cha	Equivalent
0	Abject Follower
1	Slavish Follower
2	Sycophant
3	Submissive
4	Shy Follower
5	Loyal Follower
6	Follower
7	Typical Member
8	Emergent Leader
9	Social Leader
A	Group Leader
B	Leader
C	Strong Leader
D	Dominant Leader
E	Near Absolute
F	Absolute Leader

Charisma is relative position within a small group hierarchy.

LEADERS AND FOLLOWERS

A low Cha individual will defer to and follow the leadership of a high Cha individual, regardless of other characteristics.

Conflict. A character with lower Charisma may challenge a character with high from which the character comes.

CASTE C6

Cas	Equivalent
0	Uncasted
1	Outcaste

Caste is genetically determined position within a racial structure.

Caste varies with each specific sophont species which has Caste.

Someone with Caste is generally oblivious to Social hierarchy outside of Caste.

The Personal Day

The Personal Day reflects the effects of the C3 Endurance / Stamina / Vigor characteristic in the ability of a character to remain active and alert.

C5 Personal Day

THE PERSONAL DAY FOR ENDURANCE STAMINA VIGOR

	Period	ENDURANCE	STAMINA	VIGOR	Mods
	Personal Day	**24** + Flux Hours	**48** + Flux Hours	**12** + Flux Hours	
Attention Level	Optimal	First Endurance Hours	First 2x Stamina Hours	First Vigor Hours	Mod +1 Hasty and Cautious
	Ordinary	Second Endurance Hours	Second 2x Stamina Hours	ignored	No Mods
	Tired	Third Endurance Hours	Third 2x Stamina Hours	Second Vigor Hours	Mod - 1 Hasty and Cautious
	Sleepy	After Tired ends. Check-Endurance* before any task	After Tired Ends Check-Stamina* before any task	After Tired Ends Check-Vigor* before any task	Check-C3* before any Task.
	Required Sleep	Sleep=Personal Day /3 hours restores to **Optimal**. Sleep=Personal Day /4 hours restores to **Ordinary**. Sleep=Personal Day /6 hours restores to **Tired**.		Sleep= Personal Day/6 restores to Optimal.	

* Failure = Character falls asleep for 1D minutes the first time; 1D hours the second time.

ENDURANCE EXAMPLE

Eneri Endurance Dinsha 777777 has End=7. His Personal Day (dictated by his genetics and the world on which his race evolved) is 24 + Flux hours (= 24 + 0 =) 24 hours.

When Eneri awakens at 0600, his first 7 hours are his Optimal Period. At about 1300 he begins his Ordinary Period. At about 2000 he begins his Tired Period. He works into the evening, at about 0300 he enters his Sleepy Period.

However, Eneri routinely needs 8 (= PD/ 3 = 8) hours sleep. He goes to bed at 2200 and has 8 hours sleep before awakening refreshed and Optimal at 0600 the next day.

The Long Day

Eneri awakens at 0600 and starts his shift on the bridge at 0800. He will end his shift at 1600 (three hours into his Ordinary Period).

His replacement has an attack of food poisoning, and Eneri must work the next 8-hour shift (ending at 2400). He starts his Tired Period at 2000 and the last four hours of his shift he is Tired.

By 2400, it is clear nearly everyone has food poisoning and he will have to staff a third shift. At 0300 he is Sleepy (Check-Endurance before any task). He makes a decision and takes an anti-sleep pill.

STAMINA EXAMPLE

Nargle Stamina Agash 777777 has Sta=7. His Personal Day is 48 + Flux hours (= 48 +4 =) 52 hours.

When Nargle awakens at 0600, his first 14 hours are his Optimal Period. At about 2000 he begins his Ordinary Period. At about 1000 (Day 2) he begins his Tired Period. He works into the evening, at about 2400 (midnight Day 2) he enters his Sleepy Period.

However, Nargle routinely needs 17 (= PD/ 3 = 17) hours sleep. He goes to bed at 1300 (Day 2) and has 17 hours sleep before awakening refreshed and Optimal at 0600 (Day 3).

The Long Day

Nargle awakens at 0600 and starts his shift on the bridge at 0800. He will end his shift at 1600.

His replacement has an attack of food poisoning, and Nargle must work the next 8-hour shift (ending at 2400).

By 2400, it is clear everyone has food poisoning and he will have to staff a third shift. At 0800 his third straight shift ends, and no one is yet fully recovered. He starts his fourth shift. By 1000 (Day 2) he is tired, but he can handle it. When the fourth shift ends at 1600 (Day 2), the First Officer has recovered enough to take over. Nargle gets to sleep a few hours late, and awakens at 0600 (Day 3) after 14 hours sleep (at Ordinary rather than Optimal).

VIGOR EXAMPLE

Ssssth Vigor Kshth-Othth 777777 has Vig =7. His personal day is 12 + Flux hours (= 12 -2 =) 10 hours.

When Ssssth awakens at 0600, his first 7 hours are his Optimal Period. At 1300 he begins his Tired Period (he has no Ordinary Period). At 2000 he begins his Sleepy Period.

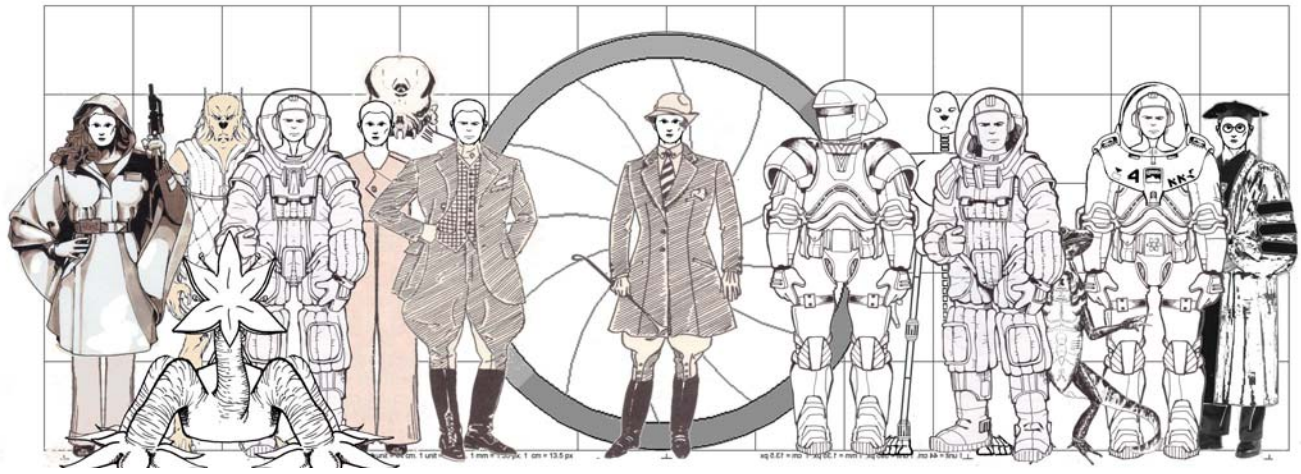
Ssssth routinely needs 2 (PD/ 3 = 2) hours sleep. He takes a quick 2 hour nap at 1800 and awakens Optimal at 2000. He works on projects until 0400, takes another quick 2 hour nap, and awakens Optimal at 0600 the next day.

The Long Day

Ssssth awakens at 0600 and starts his shift on the bridge at 0800. He will end his shift at 1600 (three hours into his Tired Period).

His replacement has food poisoning, and he must work the next 8-hour shift (ending at 2400). He knows he will get Sleepy at about 2000. It is also clear that this food poisoning event will continue and that he is unaffected, so he sets alarms for contingencies and takes a 2 hour nap from 1800 to 2000. He awakens at Optimal to finish this shift and start the third shift.

He works the third shift 2400 to 0800 by scheduling a 2-hour nap some time during the night. He can continue working shifts indefinitely if he can fit in short naps every 14 hours.



By Faces Left to right: Agent. Non-human Merchant (Aslan). Non-human Craftsman (Hiver). Spacer (in Vacc Suit-9). Citizen. Non-human Scout (Trigellian). Noble (The Marquis). Noble (The Baroness: the Marquis's Daughter). Star Marine (in BattleDress-13). Sophontiform Robot (Aslan). Scout (in Vacc Suit-9). Non-Human Newt Entertainer Chef. Functionary (in Environ Armor-10). Scholar. **Not shown:** Rogue (obviously).

The Careers

The foundation for role-playing is the **character**: the person or personality that the player uses in the game.

Traveller uses thirteen different character classes (we call them **careers**).

A career is a universally applicable vocation. To avoid an infinite proliferation of careers to encompass every possible area of interest, the **Traveller** game system defines thirteen common, typical, or prototype careers for which characters can be created.

Independent of Milieux and Tech Levels. Careers are independent of their historical time periods (the milieux) in which they play, and of the technological levels of their homeworlds. A soldier is still a soldier regardless of the historical period in which he is played. A craftsman is still a craftsman no matter what the tech level he works in.

TRAVELLER CAREERS

	Description
1	Citizen
2	Scholar
3	Entertainer or Performer
4	Craftsman
5	Scout
6	Merchant
7	Spacer (or Navy)
8	Soldier (or Army)
9	Agent
10	Rogue
11	Noble
12	Marines
13	Functionary

Careers are detailed in the process of character generation.

Citizen. Someone who, by birth or other process, owes loyalty to a state, nation, or world. A resident. A civilian. An average person.

Scholar. Someone who, through long study, has gained a mastery of one or more areas of academic study. A learned person.

Entertainer. Someone who uses his talents or abilities in performance. A person who participates in the arts.

Craftsman. Someone skilled in a trade or manual occupation; an artificer; a mechanic. An artisan. A professional whose work is consistently of high quality. A creator with great skill in the manual arts.

Scout. Someone who travels to unknown territory. An explorer.

Merchant. Someone who engages in the wholesale purchase and retail sale of goods for profit. One who runs a retail business; a shopkeeper. Especially, the operator of a (star) ship engaged in trade and commerce.

Soldier (or Army). Someone who serves in an army or fighting force. A fighter. A warrior.

Spacer (or Navy). Someone who serves in a navy or works on an armed (star) ship or (space) ship.

Marines. A member of a specially trained or specially selected fighting force.

Rogue. A deceitful, unreliable person; a scoundrel or rascal. A playfully mischievous scamp. A trickster. A traitor, dissenter, or rebel.

Agent. Someone with the power to act for another. A representative or official of a government or administrative department of a government: a government agent. A spy. A representative of the ruler, king, or emperor.

Noble. Someone possessing a higher level rank in a political or social class system.

Functionary. One who holds an office or a trust or performs a particular function; an official.

Creating Characters

Determine the Homeworld.
This world data details where the character originally came from.

Pick a Career for your character.
An advanced player may also decide to play a non-human sophont or even an artificial.

Roll characteristics for the character.
This set of physical, mental, and social characteristics is the UPP- the Universal Personality Profile.

Try pre-career enhancements.
Usually College or Training Schools, but perhaps this may be semi-Universal Service.

Resolve a career.
Earn experience and skills over the course of several years.

Leave the career (Muster Out).
Take any final benefits and note the final details of the character.

Start Adventuring!

CHARACTER GENERATION CHECKLIST

- **1** Determine character's **Homeworld** and default skills.
- **2** Determine **Sophont Race** and appropriate personal characteristics.
- **3** **Education** options (pre-Career)
  - **A** ED5 (no time required)
  - **B** Trade School (1 year/1 skill, select Major, Honors)
  - **C** College/University (4 years, select Major and Minor; Honors).
  - **D** Service Academy (4 years, select Major and Minor; Honors).
  - **E** Apprenticeship (life stage 4; Skill-4).
  - **F** Mentoring (2 years, Training +2)
- **4** Select **Career**, throw to Begin.
  - **A** If Failure (1 year), Retry if possible.
  - **B** If Retry fails (2 years), select different career and return to 4.
  - **C** Career Term Resolution (4 years).
    - **1** **Citizen/Functionary.** C/F Life= if successful, select job or hobby.
    - **2** **Entertainer.** Calculate term Fame; option" Big Break (Flux) once in career.
    - **3** **Craftsman.** Attempt Masterpiece
    - **4** **Agent.** Determine undercover career.
    - **5** **Rogue.** Determine Scheme career; can abandon before Risk and Reward.
    - **6** **Noble.** Determine Return from Exile if in Exile at start of term.
    - **7** Determine Risk and Reward/Intrigue if appropriate.
    - **9** Determine Rank, Commission/Tenure, Promotion/Elevation if appropriate.
    - **10** **Military (Army Navy Marines).**
      - **a** Attend Command College if promoted to Officer4.
      - **b** Determine term Branch and annual Operations assignments.
      - **c** Resolve ANM School assignments (1 year, Knowledge-2)
      - **d** Determine term Branch and annual Operations assignments.
      - **e** Determine Medals.
    - **11** **Agent.** Determine Commendation.
    - **12** Determine skill eligibility (including automatic skills).
    - **13** Make aging checks if life stage 5+ (age 34 for Humans).
    - **14** Continue.
      - **a** Select career change (if appropriate) or
      - **b** Throw to Continue; return to 4C if successful.
- **5** **Muster Out.**
  - **A** Non-entertainers determine Fame.
  - **B** Determine automatics and entitlements.
  - **C** Throw for money or benefits.
- **6** Note date of birth and record character details for later use.

Characters

Characters are the central focus of **Traveller**: they are the alter-egos of the players, and all activity is centered on them.

Characters are people: they may be humans, or they may be non-human sophonts, or even artificials (such as robots or androids). They have quantified abilities which define the range of their possible activities. The character is the **Traveller** personality; the player is the person engaged in playing the game. **Traveller** presents a vast diverse, but human dominated interstellar universe. This chapter addresses character generation with a focus on human character generation. Character generation also applies more-or-less equally to non-humans, including intelligent alien races (sophonts), artificial beings (androids and sophontoids), and robots.

THE PROCESS

Characters are generated through die rolls that create

Characteristics. Personal physical, mental, and social values that define the individual's basic ability to function.

Skills (and Knowledges and Talents). Descriptions of specialized abilities to deal with the universe. Skill often includes Knowledges and Talents (if appropriate).

Experience. A history of the character's life before beginning the game.

The information about a character is recorded in detail on the Character Card, and in brief summary in the UPP.

The Character Card. The standardized Character Card is a blank form designed as a ready-reference about the character. Throughout the game, the information on the CC is available to the player and the referee;

The UPP. The Universal Personality Profile is a shorthand description of the character's characteristics.

Terms. A Term is a standard period of four years. The character generation process is divided into 4-year Terms.

The Character May Be A Non-Human. This text applies equally to humans and non-humans.

Generating A Character

Create a character in the following sequence.

1. Homeworld. Determine the homeworld for the character. For some this is their birthworld; for others this is the world in which they spent their childhood.

2. Characteristics. Generate the six personal characteristics.

3. Education and Training. Consider acquiring an advanced education or additional training.

4. **Career.** Select a career and attempt to begin it. If successful, resolve the career; if unsuccessful, attempt a different career.

Careers are resolved in terms of four years. Within each term, the character confronts (through die rolls) survival, advancement, and retention; the character receives skills along the way.

5. Muster Out. Ultimately, the career ends, and the character receives benefits in the form of mementos and savings. It is at this point that the character begins actually adventuring in **Traveller**.

1. BIRTHWORLDS AND HOMEWORLDS

The world on which a character is born is his birthworld. The world on which the character was raised is his homeworld. The two worlds may be the same, or they may be different.

Homeworld Skills. World descriptions include Trade Classifications and Remarks (TC&R). A character receives one specified skill for each Trade Classification or Remark from the homeworld.

For example, a character from an Ag Agricultural world automatically receives Animals-1.

The player inspects the character's birthworld and determines the available birthworld skills. If the player is dissatisfied with the available skills, he may decide the character changed worlds as a child. A new world is determined to be the homeworld, and the available skills from the homeworld are taken.

Selecting Birthworlds and Homeworlds. Birthworlds (and homeworlds) may be assigned by the referee. They may be deliberately or randomly selected from available worlds on a map or on a list. They may be generated using the world generation charts.

Other Details. Homeworld and birthworld information includes other details (the system's star; details of local native life; local climate; preferred atmosphere).

Hidden Pasts. Some characters, for various reasons, want to hide their pasts. In casual situations, it is common for such a person to claim to be from Erehwemos or Lacipyt and reasonable people understand not to inquire farther.

Erehwemos	D876543-2	Ag Ni G0 V
Lacipyt	C345678-9	Ag Ni G0 V

Born In Deep Space. Some characters are born offworld (roll 2 on 2D). The Born In Deep Space entry on Homeworld Skills shows the available skills.

Homeworlds For A Campaign

Homeworlds are determined by the nature of the campaign. The Spinward Marches Homeworld page uses the Marches as focus. Referees may produce a similar table suited for their individual campaigns.

DATE OF BIRTH

The Referee provides the current date of the beginning of adventuring. The default date (if this information is not otherwise provided) is 001-1105 -- the first day of the 1105th year since the establishment of the Third Imperium. The general time period is "The Golden Age;" the height of the empire's power and influence.

At the end of character generation, subtract the character's age from 1105 to determine his birth year, and randomly determine the specific birth day from the Imperial Calendar.

2. PERSONAL CHARACTERISTICS

A character has six personal characteristics reflecting physical, mental, and social abilities.

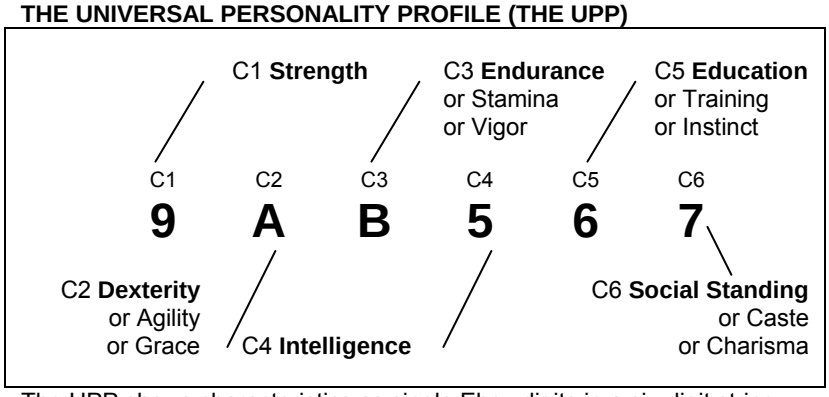
The Human Characteristics. The human Characteristics are named Strength, Dexterity, Endurance, Intelligence, Education, and Social Standing. Abbreviate the names with the first three letters of the name (Str, Dex, End, Int, Edu, Soc).

Non-Human Characteristics. Sophonts may have different characteristics.

Characteristic Numbers. The characteristics are also numbered by their position in the UPP. The number is preceded by C for Characteristic. So, C1 = Strength, C2= Dexterity, C3= Endurance, etc.

The Universal Personality Profile. The six characteristics are recorded in the six-digit string called the Universal Personality Profile.

THE UNIVERSAL PERSONALITY PROFILE (THE UPP)



The UPP shows characteristics as single Ehex digits in a six-digit string. This string is a ready reference for the abilities of the character.
Bold = Human.

Creating The UPP. For each of the six characteristics, roll 2D (some non-humans use other rolls) and record the result. Convert the values to hex and create the UPP.

For example, player John is creating a new character Eneri Dinsha.
He rolls 2D for Strength. He rolls 2 and 5.
He rolls 2D for Dexterity. He rolls 5 and 2.
He rolls 2D for Endurance. He rolls 4 and 3.
He rolls 2D for Intelligence. He rolls 5 and 6.
He rolls 2D for Education. He rolls 1 and 6.
He rolls 2D for Social Standing. He rolls 6 and 1.

The final values for the characters are 7-7-7-11-7-7. He translates these values to Ehex and creates the UPP = 777B77. This character is average in all characteristics with the exception of Intelligence, which is high.

Genetics. The first die roll for a characteristic is genetic. It has meaning when considering the genetic heritage for the individual. Retention of this information is optional but can become of importance later. If this information is not recorded during character generation, it can be recovered through genetic testing.

The Character. With the UPP generated, the Character is a Young Adult (age= 18 if Human) and ready to begin Career Resolution. A character who completes 3 Terms (of 4 years each) is 18 + 12 = 30 years old.

Eneri Dinsha 777B77.
Genetic 2545XX
Age 30. Born 069-1075.
Current Date: 180-1105

Homeworld

This table creates a homeworld for a character (human or other). For humans, references to sophonts refer to the non-human natives of the world.

Homeworld-01

Homeworld / Homestar
Habitable Zone
Native Status

REQUIRED SYSTEM INFORMATION FOR HOMEWORLDS

The star system and homeworld data required for a character include:

Homestar Spectral, Decimal, Size.
World or Satellite (and Satellite Orbit), and Habitable Zone Variation.
Habitable Zone for the System.
Homeworld Name, the SAHPG component of the UWP, and Climate.
Native Status.

PRE-EXISTING INFORMATION

Additional information may already be available. These tables control world creation when necessary.

HOMEWORLD

Create the SAHPG (Size, Atmosphere, Hydrographics, Population, Government) components of the Universal World Profile.

S. Size. Planetary Size: 2D-2.
A. Atmosphere: Flux + Size.
If Size =0, Atmosphere =0.
H. Hydrographics. Flux+ Size.
Maximum A.
If Size =0-1, Hyd =0;
If Atm =0-1 or A+, Hyd DM - 4.
P. Population. 2D-2.
G. Government. Flux +Pop.
Convert negative values to 0.

NATIVES

Sophonts who evolved on the Homeworld are Natives.
Native sophonts are identified as "of" a homeworld.
All other sophonts are identified as "from" a different (native) homeworld.

WORLDS

World. A planet or satellite.
Planet. A world orbiting a star.
Satellite. A world orbiting a planet.
Mainworld. The most important world in a system.
Belt. An asteroid belt (which may be a mainworld) or a planetoid belt.

HOMESTAR

Flux	Sp	O	B	A	F	G	K	M
		Size						
- 6	OB	Ia	Ia	Ia	II	II	II	II
- 5	A	Ia	Ia	Ia	II	II	II	II
- 4	A	Ib	Ib	Ib	III	III	III	II
- 3	F	II	II	II	IV	IV	IV	II
- 2	F	III	III	III	V	V	V	III
- 1	G	III	III	IV	V	V	V	V
0	G	III	III	V	V	V	V	V
+1	K	V	III	V	V	V	V	V
+2	K	V	V	V	V	V	V	V
+3	M	V	V	V	V	V	V	V
+4	M	IV	IV	V	VI	VI	VI	VI
+5	M	D	D	D	D	D	D	D
+6	M	D	D	D	D	D	D	D

Size IV is not possible for K5-K9 and M0-M9 stars. Size VI is not possible for A0-A9 and F0-F4 stars.

WORLDS AND ORBITS

Flux	World	HZ Var	Satellite Close	Satellite Far
- 6	Satellite	- 2	Ay	En
- 5	Satellite	- 1	Bee	Oh
- 4	Satellite	- 1	Cee	Pee
- 3	Satellite	- 1	Dee	Que
- 2	World	0	Ee	Arr
- 1	World	0	Eff	Ess
0	World	0	Gee	Tee
+1	World	0	Aitch	Yu
+2	World	0	Eye	Vee
+3	World	+1	Jay	Dub
+4	World	+1	Kay	Ex
+5	World	+1	Ell	Wye
+6	World	+2	Em	Zee

HABITABLE ZONE ORBIT

Spectral> Size	A0-A3	A4-A8	A9-F1	F2-F6	F7-G1	G2-G8	G9-K3	K4-K8	K9-M3	M4-M8	M9
Ia	12	12	12	12	11	12	12	12	12	12	12
Ib	11	11	10	10	10	10	10	10	10	11	11
II	9	9	8	8	8	8	8	9	9	10	11
III	8	8	7	6	6	6	7	7	8	8	9
IV	7	7	6	6	5	5	5	-	-	-	-
V	7	7	6	5	4	3	2	2	0	0	0
VI	-	-	-	3	3	2	1	0	0	0	0
D	0	0	0	0	0	0	0	0	0	0	0

The Habitable Zone (HZ) orbit number shown here indicates a world surface environment which is hospitable to humans and similar sophonts.
For example, Sol is a G2 V star. Its habitable zone is Orbit=3.

NATIVE STATUS

Note the status of the sophonts.
Transients. Pop = 1-2-3. Locals are present as merchant, corporate, military, or research personnel.
Settlers. Pop = 4-5-6. Locals have settled here but do not (as yet) meet the criteria for colonists or transplants.
Colonists. Gov = 6.
Corporate. If Gov = 1 (employees).
Transplants. Atm = 0-1. Sophonts evolved elsewhere and settled this world many years ago. Not used if Settlers or Transients.
Extinct / Vanished. Pop = 0. The sophonts are Extinct. If Transplants, call them Vanished instead. If TL>0, Catastrophic Extinct (or Vanished).
Exotic. Environment (Atm >9) makes these sophonts incompatible with traditional human environments.
Natives. If not Settlers, Colonists, Corporate, or Transplants, they are Natives. Pop 0 or 7+ and Atm 2+.

CLIMATE

A Mainworld in the orbit shown is marked with this climate.

HZ	Temperate	
HZ - 1	Hot	
HZ +1	Cold	
HZ = 0 or 1	Twilight Zone	= Tz
Close Satellite	Locked	= Lk

Hot. At the upper limits of human temperature endurance.
Cold. At the lower limits of human temperature endurance.
Twilight Zone. Tidally locked with a Temperate band at the Twilight Zone, plus a Hot region (hemisphere) facing the Primary and a Cold region (hemisphere) away from the Primary.
Locked. Satellite (Ay through Em) Locked to the planet it orbits. A Locked satellite does not have a Twilight Zone; its day length equals the time it takes to orbit its planet.

Homeworld Skills

Using the Universal World Profile UWP for the character's homeworld, determine all possible Trade Classifications that apply. A character receives the homeworld skill associated with each Trade Classification.

Homeworld-02

Trade Classifications

Group	Code	Siz	Atm	Hyd	Pop	Gov	Law	Definition	--	Skill
Planetary	As	0	0	0	--	--	--	Asteroid	--	Zero-G
	De	--	23456789	0	--	--	--	Desert	--	Survival
	Fl	--	ABC	123456789A	--	--	--	Fluid		Hostile Environ
	Ga	678	568	567	--	--	--	Garden World	--	Trader
	He	3456789A	2479ABC	012	--	--	--	Hellworld		Hostile Environ
	Ic	--	01	123456789A	--	--	--	Ice-Capped	--	Vacc Suit
	Oc	ABC	--	A	--	--	--	Ocean World	--	Hi-G
	Va	--	0	--	--	--	--	Vacuum	--	Vacc Suit
	Wa	56789	--	A	--	--	--	Water World	--	Seafarer
Population	Di	--	--	--	0	0	0	Dieback (000-T)	TL>0	---
	Ba	--	--	--	0	0	0	Barren	TL=0	---
	Lo	--	--	--	123	--	--	Low Population	--	Flyer
	Ni	--	--	--	456	--	--	Non-industrial	--	Driver
	Ph	--		--	8	--		Pre-High	--	
	Hi	--	--	--	9ABC	--	--	High Population	--	Streetwise
Economic	Pa	--	456789	45678	48	--	--	Pre-Agricultural	--	Trader
	Ag	--	456789	45678	567	--	--	Agricultural	--	Animals
	Na	--	0123	0123	6789ABC	--	--	Non-agricultural	--	Survey
	Pi	--	012479	--	78	--	--	Pre-Industrial	--	JOT
	In	--	012479	--	9ABC	--	--	Industrial	--	One Trade
	Po	--	2345	0123	--	--	--	Poor	--	Steward
	Pr	--	68	--	59	--	--	Pre-Rich	--	Craftsman
	Ri	--	68	--	678	--	--	Rich	--	One Art
Climate	Fr	23456789	--	123456789A	--	--	--	Frozen	HZ +2 or outer	Hostile Env
	Tr	6789	456789	34567	--	--	--	Tropic	HZ -1	Survival
	Tu	6789	456789	34567	--	--	--	Tundra	HZ +1	Survival
	Tz	--	--	--	--	--	--	Twilight Zone	Orbit 0-1	Driver
Secondary	Fa	--	456789	45678	23456	--		Farming	Not MW. HZ	Animals
	Mi	--	--	--	23456	--		Mining	Not MW. MW=In	Survey
	Cy	--	--	--	56789A	6	0123	Colony	--	Driver
	Pe	--	--	--	34567	6	6789	Penal Colony	Imperial	Fighting
	Re	--	--	--	1234	6	45	Reserve	Imperial	Flyer
Political	Cp	--	--	--	--	--		Subsector Capital	Imperial	Admin
	Cs	--	--	--	--	--		Sector Capital	Imperial	Bureaucracy
	Cx	--	--	--	--	--		Capital	Imperial	Language
	An	--	--	--	--	--		Ancient Site	--	Xenology
	Ab	--	--	--	--	--		Data Repository	--	One Knowledge
Special	Sa	--	--	--	--	--	--	Satellite		
	Fo	--	--	--	--	--	--	Forbidden (Red Zone)	--	
	Pz	--	--	--	789ABC	--	--	Puzzle (Amber Zone)	--	
	Da	--	--	--	0123456	--	--	Danger (Amber Zone)	--	

Ba requires Starport E, X. Cp, Cs, Cx require Starport A. Politicals and Specials assigned by Referee (not generated).

Ab	One Knowledge	Di	no skill	Na	Survey	Ri	One Art
Ag	Animals	Fa	Animals	Ni	Driver	Tr	Survival
An	Xenology	Fl	Hostile Env	Oc	Hi-G	Tu	Survival
As	Zero-G	Fr	Hostile Env	Pa	Trader	Tz	Driver
Ba	no skill	He	Hostile Env	Pe	Fighting	Ux	Xenology
Co	Driver	Hi	Streetwise	Pi	JOT	Va	Vacc Suit
Cp	Admin	Ic	Vacc Suit	Po	Steward	Wa	Seafarer
Cs	Bureaucracy	In	One Trade	Pr	Craftsman		
Cx	Language	Lo	Flyer	Pw	Trader		
De	Survival	Mi	Survey	Re	Flyer		

Born In Deep Space

Zero-G
Vacc Suit
One Ship Skill

Homeworld Skills

For each TC shown for a homeworld, the character receives one level of the indicated skill.

Spinward Marches Homeworlds

Homeworlds for characters are determined by the nature of the campaign. As an example to referees, the method demonstrated below uses the Spinward Marches as a focus. Referees can produce a similar table suited for their individual campaigns.

Homeworlds

CREATE A HOMEWORLD

For characters adventuring in the Spinward Marches, create their homeworlds from the available worlds here.

HOMEWORLD

1D	1	2	3	4	5	6
1	A	B	C	D	E	F
2	G	H	J	K	L	M
3	N	P	Q	R	R	S
4	T	U	V	W	X	Y
5	Z	1	2	3	4	5
6	5	6	7	8	9	0

Roll 1D and 1D for one result.

Code	WorldName	Hex and Sector	Description
A	Alell	1706 Spinward Marches	Oppressive, rich bureaucratic world (Ph Pa Ri)
B	Boughene	1904 Spinward Marches	Non-industrial, domed world, corrosive atmosphere (Fl Ni)
C	Capital	2118 Core	Capital of the Third Imperium (Hi Cx)
D	Dorannia	0530 Spinward Marches	Poor, non-industrial hellworld (He Ni Po)
E	Efate	1705 Spinward Marches	High-tech industrial world (Hi In)
F	Feri	2005 Spinward Marches	Rich, low gravity world (Ph Pa Ri)
G	Magash	0316 Deneb	High-tech, busy, industrial, capital world (Va Hi Na In Cp)
H	Hefry	1909 Spinward Marches	IISS regional administration (Va Ni)
J	Jenghe	1810 Spinward Marches	"Truck Stop" colony world (Ni)
K	Earth	1827 Solomani Rim	Homeworld of humaniti (Ga Hi)
L	Lakou	0638 Spinward Marches	Tiny, backwater colony (Ni)
M	Macene	2612 Spinward Marches	Asteroid belt mining colony (As Ni)
N	Knorbes	1807 Spinward Marches	Rich, low-tech agricultural/archaeological world (Ag Ri)
P	Preslin	0633 Deneb	Poor dry rockball (De Ni Na Po)
Q	Yori	2110 Spinward Marches	Rich desert world (De Ri)
R	Regina	1910 Spinward Marches	Rich, Earthlike capital world (Ph Pa Ri Cs)
S	Ruie	1809 Spinward Marches	"Independent", balkanized, TL7 "war world" (Hi In)
T	Tremous Dex	1311 Spinward Marches	Ice world (Ic Ni)
U	Uakye	1805 Spinward Marches	Non-industrial backwater world (Ni)
V	Vland	1717 Vland	Capital world of the First Imperium (Hi Cs)
W	Wroclaw	0226 Deneb	Agricultural, oppressively collectivist world (Ag Ri)
X	Menorb	1803 Spinward Marches	Poor, crowded world (Hi Po)
Y	Yorbund	2303 Spinward Marches	Domed world, insidious atmosphere (Fl Ni)
Z	Traltha	2834 Spinward Marches	Desert "archaeological mysteries" world (De He Ni)
1	Dentus	2201 Spinward Marches	Desolate border world (Ni)
2	Vanzeti	0218 Deneb	Non-industrial water world (Wa Ni)
3	Syr Darya	1810 Deneb	Nondescript agricultural world (Ni Ag)
4	Aramis	3110 Spinward Marches	Underground colony (He Ni Cp)
5	Rhylanor	2716 Spinward Marches	High tech, crowded capital world (Hi Cp)
6	Raschev	3230 Foreven	Atomic-era backwater world (Ri)
7	Ara Pacis	0419 Deneb	Balkanized, non-industrial world (Ni)
8	Roup	2007 Spinward Marches	Popular dictatorship, water world (Wa Hi In)
9	Pax Rulin	2204 Trojan Reaches	Cold, small, poor capital world (Ic Va Lo Cp)
0	Space	Grew up in space	A free trader serving backwater worlds (Na Va).

This table shows the format for character homeworld selections. It shows a variety of worlds within the current adventuring region, adds several important worlds from outside the region, and identifies each with a short description.

3. PRE-CAREER EDUCATION (AND TRAINING)

Characters may pursue improvements to Education or Training.

Education. Human characters (and Sophonts with Edu) can pursue traditional Education.

Education involves attending a school, academy, college, or university. A character may attend one or more schools which may provide additions to Education and new levels of skills.

TraIning. Sophonts with Tra are at a disadvantage in Education (since they use Tra/2 for Edu). They benefit from Training and courses which depend on Tra.

Training involves enrolling in a training process: apprenticeship, mentoring, or a training course. A character may attend one or more such processes, which may provide additions to Training and increases in skills.

Instinct. Sophonts with Ins are generally excluded from the Education (or Training) process.

Later Education or Training. Characters may suspend career resolution to return to school or training. At the beginning of any term, the character may apply for any Educational institution or Training, and if accepted substituted that process for the entire term.

Some schools are attended during career resolution (being assigned as part of career resolution).

The Educational Process

Education is a multi-step process. If Pre-Requisites are met, the character Applies for Admission. If successful, the character rolls for Pass/Fail for each year of the process. Each Pass awards one of the available skills; Failure terminates the process (but Waiver may result in reinstatement, although no skill is received). A character may roll for Honors. Finally, a character who completes (who Passes or who has Failure Waived) Graduates and receives Graduation benefits.

Major and Minor. The character attending an Educational Institution selects a Major and a Minor from the appropriate Skill and Knowledge list. A character may select any Major and Minor (but they may not be the same) and change them each time a new Educational Institution is attended.

A character's current Major and Minor are the most recent ones selected (which determines the skills taken as Major or Minor during career resolution).

EXAMPLE EDUCATION TABLE

	College	Comment
Pre-requisite	Edu = 5	No if Edu=4 or less
To Apply	Int or Edu	Check Int or Edu
Pass/Fail	Int or Edu (4x)	Roll 4 times
Duration	4 years	
Graduation	Edu = 8	upon graduation
and	Bachelor	

Pre-Requisites. Pre-requisites are minimums: any value or greater is acceptable.

Admission. To apply for Admission, a character must Check one of the stated Characteristic or less. If the roll fails, this institution may not be attended. Each failed application consumes one year.

Pass/Fail. A character must Pass each year of attendance. Check the stated Characteristic or less the stated number of times. Each success Passes one year; success in all rolls awards Graduation. Failure ends attendance (subject to Waiver).

Honors. A character can optionally make one additional Pass/Fail Roll: success confers Honors and one level from the Major. Failure has no effect.

Skills. Each successful Pass awards one level from the Major. Each two successful Passes awards one level in the Minor.

Duration. The number of years required for the process.

Graduation. At the end of the school, an individual who has passed all years Graduates and receives those benefits.

The Available Educational Institutions

Education takes six basic forms:
ED5, **Trade Schools**,
College or **University**,
Service (Naval or Military) Academies,
ANM Schools, and
Special Military Education.

ED5 is a program intended to raise low Edu to a minimally acceptable level. Edu-5 is the minimum pre-Requisite for Trade Schools; a character with Edu less than 5 needs to take ED5 to raise his Edu to this minimally acceptable level.

A character with Edu less than 5 can attempt the ED5 program at the start the Education process. Check Int: if successful, Edu is raised to 5. The process can be attempted once. It takes no time. Failure has no other effect.

Trade School provides vocational education in specific (generally non-academic) skills.

ANM Schools (Army Navy Marine School) are one-year military trade schools teaching Knowledges. They are assigned during career resolution: when assigned, the character uses this Educational process to determine the Pass/Fail and the Knowledge received. The character then returns to Career resolution and resolves the current term.

ANM Schools award Knowledges in addition to normal skill eligibility.

College provides a basic college education, resulting in an increase in Edu and in increases levels of his Major and Minor. **University** provides the same benefits as College but is more prestigious; it can also provide Masters Degrees and Doctorates. A character attending College or University may also participate in OTC (Officer Training Corps) or NOTC (Naval Officer Training Corps). Often associated with a University are a **Medical School** (to educate medical doctors) and a **Law School** (to educate lawyers).

A University Masters Program requires a Bachelors in addition to Edu 8+ A Professors Program requires a Masters in addition to Edu 9+. Attending Med School or Law School requires an Honors Bachelors. All of these requirements can be waived.

Military and **Naval Academies** are similar to College: in addition to a degree, they provide an Army or Navy Commission upon graduation. A Naval Academy graduate may choose a Marine Commission instead. The character is required to serve one term in the service. At the end of that term, the character may try to continue, or may attempt any other career available. He is in the Reserves. Service Academy Honors Graduates may attend **Flight School**.

Command College is a special Military School for characters with Army, Navy, or Marine rank Officer4. At the beginning of the first term the character is O4, the first event is Command College. A character who fails Command College may not Continue in the service.

Education

There are many possible ways in which a character may improve Eduation; there are somewhat fewer ways to improve Training; and virtually no ways in which to improve Instinct.

Education

ED5. Before beginning Education, a character with Edu 4 or less can Check Int: success raises Edu to 5.

EDUCATION	College or University*	University	University
Pre-requisite	Edu = 5+ or 7+*	Edu = 8+	Edu = 9+
To Apply	Int or Edu	Int or Edu	Int or Edu
Pass/Fail	Int or Edu (4x)	Int or Edu (2x)	Int or Edu (2x)
Duration	4 years	2 years	2 years
Graduation	Edu = 8	Edu = 9	Edu= 12
and	Bachelor	Master	Doctor
	Med School	Law School	Trade School
Pre-requisite	Honors Bachelor	Honors Bachelor	C5 = 5
To Apply	Int or Edu	Int or Edu	C2 or C3
Pass/Fail	Int or Edu (4x)	Int or Edu (3x)	Int or Tra (1x)
Duration	4 years	2 years	1 year
Graduation	Edu = 10	Edu = 10	--
and	Medical Doctor	Lawyer	

TRAINING	Apprentice	Training Course	Mentor
Pre-requisite	--	C5 = Tra	C5 = Tra
To Apply	auto	auto	Int
Pass/Fail	Tra (1x)	Tra (1x)	Int or Tra (1x)
Duration	4 years*	1 year	1 year
Graduation	--	--	Tra +2
	*before Life Stage 3		(no Major)

MILITARY SCHOOLS	ANM School	Command College	Service Academy
Pre-requisite	assigned	assigned	C5 = 6
To Apply	auto	auto	Int or Edu
Pass/Fail	C2 or C3 (1x)	Int or C5 (2x)	Int or C5 (4x)
Duration	1 year	2 years	4 years
Graduation	--	--	C5 = 8
And			Commission

Major and Minor. The character selects a Major and a Minor from the appropriate Skill and Knowledge list.

Honors. A College or University student may roll one additional Pass/Fail: success confers Honors and Major+1.

OTC/NOTC. A College or University student may enroll in OTC (Officer Training Course) or NOTC (Naval Officer Training Course) and make one Pass/fail roll: success confers a Commission (OTC = Army Officer1 or Marine Officer1; NOTC = Navy Officer1).

Flight School. A Service Academy Honors graduate may take a 1-year Flight School (Pass/Fail: C2): Passing confers Pilot-2.

ANM Army Navy Marine School

Army Navy Marine Schools are assigned during a military or naval career. The school is resolved and the character returns to career resolution. ANM schools confer Knowledges (rather than Skills), but each year confers Knowledge-2. The ANM Schools Chart shows the available Majors (coded A=Army, N=Navy, M=Marines).

Command College

Every Army Navy and Marine Officer4 is assigned to Command College in the Term he is promoted to Officer4. The character resolves the college and returns to career resolution.

MAJORS AND MINORS

College/University

Any of The Arts
Any of The Sciences
Athlete
Broker
Bureaucrat
Counsellor
Designer
Language
Teacher

Law School

Advocate
Bureaucrat
Counsellor
Diplomat
Psychology

Medical School

Biology
Forensics
Medical
Sophontology

Apprentice
Training Course
Trade School

Admin
Advocate
Animals
Any of The Arts
Any Talent
Any Trade
Comms
Computer
Counsellor
Driver
Engineer
Explosives
Flyer
Forensics
Language
Medical
Seafarer
Sensors
Small Craft

Flight School

Pilot

ANM Schools

A	-	-	ACV
A	N	-	Aeronautics
A	-	M	Artillery
A	-	M	Automotive
-	N	-	Bay Wpns
A	-	M	Beams
A	-	M	Blades
A	N	M	Btl Dress
A	-	M	Exotics
A	-	-	Flapper
A	N	M	Grav
-	N	-	J-Drives
A	-	M	Launcher
A	-	-	Legged
A	N	-	Life Sup
A	-	-	LTA
-	N	-	M-Drives
A	-	-	Mole
A	-	M	Ordnance
-	N	M	Ortillery
A	N	M	P-Plants
A	-	-	Rotor
A	N	-	Screens
A	N	M	Slug Throw
-	N	-	Spines
A	-	M	Sprays
A	-	M	Tracked
A	N	M	Turrets
A	-	M	Unarmed
A	N	M	Wheeled
A	N	-	Wing
A	N	M	WMD
A	-	M	Rider
A	N	M	Trainer
A	-	M	Ship
A	-	M	Small Craft

Naval Academy

Any Starship Skill
Leader
Naval Architect
Tactics

Military Academy

Any Soldier Skill
Leader
Tactics

Command College

Strategy
Leader
Liaison
Fleet Tactics

OTC / NOTC. Officer Training Corps and Naval Officer Training Corp are College or University based courses that produce officers for the armed forces.

Success confers a Commission (OTC= Army Officer1; NOTC = Navy Officer1 or Marine Officer1). The character is required to serve one term in the service. At the end of that term, the character may try to continue, or may attempt any other career available. He is in the Reserves. College or University Honors Graduates may attend **Flight School**.

Educational Waivers. A student attending an Education Institution who receives an adverse die roll or decision (Prerequisite, Admission, Pass/Fail, Honors) may try for a Waiver. To receive a Waiver, roll Soc or less (2D); Mod minus number of previous waivers rolled (successful or not).

Waivers are unique to the Education Process and apply only to Schools and Education (and the Scholar career, but not other careers).

Education Notes and Restrictions. C5 Edu reflects the individual's ability in an Educational setting, even if the person does not have the formal documentation. For example, a character with Edu=9 can function at the equivalent of a Masters in Educational situations even though he may not have the formal diploma.

The Training Process

Training takes three forms: Apprenticeship, Mentoring, and Training Courses.

Apprenticeship. Apprenticeship takes place before character generation begins (as a retroactive process, before Life Stage 3). It attaches a sophont to a trainer who then instills in that sophont in a new skill.

A single skill or knowledge is selected; Pass/ Fail is rolled once, and Success awards Skill-4.

The character begins Life Stage 4 with the skill.

Mentoring. A sophont who wants (or needs) to increase his C5 Training can attach himself to a Mentor. The process takes two years and increases Tra +2.

Training Course. A focused training course provides intensive hands-on experience in one specific skill or knowledge.

On worlds or in cultures where Training is the predominant characteristic, the need is met through training Institutions (similar to colleges or universities but using different methods adapted to the analog characteristic Training).

On worlds with diverse populations, the Training function is provided within Educational institutions, which serve as providers of apprenticeships, mentoring, and training courses.

Specific Educational Institutions

Characters who attend schools, colleges, and universities can determine the specific name of the school attended from the Educational Institution Chart. The information adds to the character's background; occasionally, a character will meet someone who also attended that school.

School Rank. The chart allows determination of the relative rank of schools when compared with others.

4. SELECTING AND RESOLVING A CAREER

A character selects a career from one of the thirteen available. This selection is influenced by the character's characteristics and current experience, but is ultimately a decision based on the player's goals and preferences.

THE CAREERS

2D	Description
	Citizen
2	Scholar
3	Entertainer
4	Craftsman
5	Scout
6	Merchant
7	Spacer
8	Soldier
9	Agent
10	Rogue
11	Noble
12	Marine
	Functionary

Each Career has a page of instructions detailing the specific career.

Careers are numbers 2 through 12 to allow random selection (using 2D) of a career.

THE PROCESS

Career Resolution is a multi-step process resolved in Terms of four years each. The process carries the player through the stages of the career: Beginning, Risk and Reward, Rank, and Continue. At each stage, the player rolls to determine success or failure and the resulting consequences.

The process uses Target numbers against which the player rolls 2D: a result equal or less than the Target is successful. Greater than the Target is failure. Some Targets allow Mods (a Mod increases the Target and increases the chance of success). If the requirement is met, the Mod may be used. For example, Mod +2 if Int 6+. If the character is Int 6 or greater, the Target is increased +2.

One cycle of the Career Resolution Process completes a 4-year Term.

Target Numbers. Targets may be automatic, a number (10, or 5) or Characteristics (named, or as a Position Code). Position codes allow non-human characters to participate in Career Resolution.

Pre-Requisites. Some Careers have requirements before a character may attempt to Begin.

To Begin

Roll the Begin Target.

Some Careers allow Retry. If Begin fails, the character may immediately Retry.

If both Begin and Retry fail, this career may not be used. Each failed attempt (both Begin and Retry) consumes one year.

Risk and Reward

The Risk and Reward sequence uses a standard procedure.

Note the series of Characteristics available. The Character picks one of these Characteristics (any one anywhere in the sequence) and it governs Risk and Reward

for the current Term. This Characteristic cannot be used again until all of the others in the sequence have been used.

Once Per Term. Risk and Reward is rolled once per term and reflects all of the activity of the character within the term.

Roll 2D. The Character will roll 2D twice using the same Characteristic.

Before rolling for Risk, the Character may (but is not required to) select a Mod= +2 (Caution) OR Mod = - 2 (Bravery) to apply against the Risk roll. This Mod is applied with an opposite sign to the Reward roll.

The Armed Forces (Army, Navy, Marine) Careers require DMs for Branch and Operations: these DMs must be applied against the Risk Roll and (with opposite sign) against the Reward Roll.

Selecting a positive Mod increases the chance of succeeding at Risk and of failing at Reward; selecting a negative Mod increases the chance of failing at Risk and succeeding at Reward.

Selecting a positive DM decreases the chance of succeeding at Risk and of failing at Reward; selecting a negative DM decreases the chance of failing at Risk and succeeding at Reward.

The Character rolls for Risk (2D <= Characteristic + Mod). If Risk fails, he goes no farther. If he succeeds, he rolls again for Reward (2D <= Characteristic - Mod). If Reward fails, there is no Reward. If Reward succeeds, the Reward outcome is resolved.

For example, Eneri Dinsha 777B77 has selected Strength for Risk and Reward. He also selects the Caution Mod +2. He rolls for Risk (2D = 9 versus Str =7 + 2 = 9) and succeeds. He rolls for Reward (2D = 7 versus Str = 7 - 2 = 5) and fails.

Or, less fortunately, Eneri Dinsha 777B77 is in the Marines and has selected Strength for Risk and Reward. He also selects the Caution Mod +2. He rolls for Risk (2D = 12 versus Str =7 + 2 = 9) and fails. His failure indicates he has been wounded or injured. He receives hitpoints equal to his Characteristic (Strength) minus the Roll (=7 - 12) = -5. He rolls for Recovery (=1D)= 4. His Strength is permanently reduced -1. Because he failed the Risk Roll, he cannot attempt the Reward Roll.

- **Citizen Life.** The Citizen career uses a variant of **Risk and Reward** called **Citizen Life**. Only one roll is made to determine Success or Failure. No Mods are used.
- **Entertainer.** The Entertainer career focuses on Fame and resolves the current level of Fame for the character.
- **Craftsman.** The Craftsman career focuses on the creation of Masterpieces as detailed on the Craftsman Career page.

Rank, Position and Promotion

(Some careers [Citizens, Entertainer, Craftsman, Scout, Agent, and Rogue] do not have rank, position, or promotion, and this procedure does not apply.)

2D	Career	Initial Rank	Advanced Rank
	Citizen	no rank	
2	Scholar	varies	
3	Entertainer	no rank	
4	Craftsman	no rank	
5	Scout	no rank	
6	Merchant	Merchant0	
7	Spacer	Spacer1	Officer1
8	Soldier	Soldier1	Officer1
9	Agent	no rank	
10	Rogue	no rank	
11	Noble	varies	
12	Marine	Marine1	Officer1
	Functionary	Clerk	Functionary1

Armed Forces characters (Army, Navy, Marines) begin with enlisted rank (Army = Soldier1, Navy = Spacer1, Marines = Marine1). Merchant characters begin with an inconsequential rank (Merchant = Merchant0). Scholars begin with formal rank (Scholar = Scholar1) if they have Edu=8+. Nobles begin with rank equal to their Social Standing. Functionaries begin with an inconsequential rank (Functionary= Functionary0).

Enlisted Promotion (Army Navy Marines). Armed Forces characters roll the Promotion Target. Success increases rank +1.

Commission. If the character is enlisted rank (Spacer, Soldier, Marine) Armed Forces characters roll the Commission Target. If successful, the character moves to the Officer rank track and receives Officer1.

Officer Promotion (Army Navy Marines). Armed Forces characters roll the Officer Promotion Target. Success increases rank +1.

Scholar Promotion. Scholars with Scholar1 or higher roll the Scholar Promotion Target. Success increases rank +1.

Merchant Promotion. Merchants with Merchant0 roll the Rank0 Promotion Target. All others roll the Officer Promotion Target. Success increases rank +1.

Elevation. Nobles use a special procedure. Elevation is Roll High (roll Soc or greater to be Elevated to the next higher Noble rank) and its associated increase in Social Standing (if any).

Acquiring Skills

Characters acquire skills in the course of each Term. The Skill Eligibility table shows the number of skills received.

Rolling For Skills. For each skill, roll on the Career Skills Table. Skills are taken from the Career Skills table. The character selects a column and rolls 1D for the specific skill.

Automatic Skills. Some careers provide automatic skills (for example, a Merchant upon reaching rank Merchan1 receives an automatic skill= Steward). Automatic skills are awarded as a one-level increase if the skill is already held. If not, the character receives the skill at level-1.

Continue

At the end of the 4-year Term, the Character must successfully roll (2D) to Continue in the career. Success allows the character to Continue to the next 4-year Term. Failure requires that the character end Career Resolution and begin adventuring.

Changing Careers. A character may avoid the Continue roll by selecting one of the Career Change Options for which he is eligible.

The Armed Forces

Three careers are considered the Armed Forces: **Spacers**, **Soldiers**, and **Marines**. Each of these careers adds background information on the career in the form of Branch and Assignment.

Armed Forces Branch. Branch is the specialization the individual has within the service. It defines his probable duties in the service.

When the character Begins in a service, roll for Branch. A non-officer character may change (reroll) Branch at the end of each Term. A character who receives a Commission may roll for Branch or keep his current Branch (for Spacers, Crew becomes Line). An Officer may not change Branch.

Branch provides a DM which must be applied to Risk and Reward.

Armed Forces Assignment. The <Service> Operations table provides assignments for Armed Forces characters. Appropriate columns distinguish between Naval Officers and Crew, and between Branches for Soldiers and Marines.

Roll for Assignment four times per Term (for four annual assignments).

Each assignment provides a DM. Determine the highest value for the Term: it must be applied to Risk and Reward.

Medals. The primary rewards in the Armed Forces are medals. If the Reward Roll Succeeds, subtract the Reward Roll from the Controlling Characteristic (ignore any Mods) and consult the Medals Table.

For example, Star Marine Captain Sir Mountain Dressler III 98998B participated in what came to be known as the Retreat from Jewell. In this Term, he is in the Protected Forces (Mod 2), and one of the four annual assignments he draws is Battle (Mod 3). For the Term, he is rolling Risk and Reward once using these required Mods.

For Risk and Reward, he has selected Str (=9) as his Controlling Characteristic. He also selects the Caution Mod 2).

He must roll 6 (=9 -2 -3 +2 = 6) or less to survive the Risk roll. He rolls 5.

He turns to the Reward roll. The signs on the Mods change and he must roll 12 (=9 +2 +3 - 2 = 12) or less to receive a Reward. He rolls 2.

He receives a Campaign Ribbon (The Retreat from Jewell) and consults the Medals Table.

His Controlling Characteristic was Str = 9. His Reward Roll was 2. He consults the Medals Table (=9 - 2 = 7) and at line 7 receives the SEH.

The Medals Table is on the Fame page.

AGING

Characters reaching Life Stage 5 (Age 34 for Humans) are subject to Aging (on the Life Stages and Aging Tables).

THE PRIOR CAREER

Each career is fully described on its own comprehensive page. Once the career is selected, turn to that page and resolve it according to the rules on that page. Once the career is complete, proceed to Mustering Out.

5. MUSTERING OUT

Mustering Out is a military term, but it captures the concept for characters in non-military careers as well. When characters Muster Out, they are making a change from their prior career to a new life: from the known to the unknown, and from the mundane to the adventuresome. Mustering Out counts up the character's belongings (at least the major ones), the money, and the abilities that a character has accumulated through several years of career, and notes them as assets for the adventuring situations to come.

Mustering Out produces three types of awards: Automatics, Entitlements, and Benefits.

AUTOMATICS

When a character ends character generation he may already own specific awards or items. This step catalogs them.

Personal Weapons. Any character who has received Fighting-1 or greater owns one personal weapon, which may be any weapon appropriate for the skill held.

This benefit does not apply for skills other than Fighting (that is, not Heavy Weapons or Gunnery; characters do not automatically acquire an AutoCannon to carry in their personal baggage).

Land Grants. Any character who has received a Land Grant retains it at Mustering Out.

A Land Grant creates a token annual profit (the amount remaining after expenses are deducted from income), based on the trade classifications of the world, equal to Cr10,000 per TC. For example, a world classified as Hi In Va provides an income of Cr30,000 per year. A World with no TC generates Cr5,000 per year.

Masterpieces. Any character who has created Masterpieces retains them at Mustering Out.

Medals. The character may have received medals for heroism, campaign ribbons, and wound badges. Agents may have received Commendations. These items remain in the possession of the individual and may serve to enhance his reputation.

Fame. Any character may have Fame as a consequence of Career Resolution, or may elect to determine his Fame using the Fame rules. If the **Fame Flux Event** has not yet been invoked, it may be invoked here (or not; it can be saved for later).

BENEFITS

Benefits are the results of dice rolls.

A character is allowed one Mustering Out roll for each term served in Career Resolution. He is allowed one additional roll per Commendation, and per MCG or SEH. He is allowed one additional roll if Fame 19+.

Roll 1D + DMs. If the DM is Terms, use the number of Terms served in that Career. If the character later served as a Functionary associated with that Career, add those Functionary Terms to the DM.

If the roll is greater than the maximum value on the table, use the maximum value instead.

Which Table? Use the Mustering Out Table corresponding to the Career. For example, Eneri Dinsha served one term each as a Merchant (Term 1), an Entertainer (Term 2), and finally as a Functionary (Term 3). He makes one roll on the Merchant Table, one roll on the Entertainer Table (DM +1 because he served one Term in that career), and one roll on the Functionary Table (DM +1 because he served one Term in that career).

Which Column. The character may select either the Money or the Benefits column for each roll.

Available Benefits

The Career Resolution Process ends with the accumulation of Mustering Out benefits.

Money. Cash received represents travel allowances and personal savings. Money is provided on a separate column.

Passages. Passages received represent travel allowances provided by a former employer.

StarPass is a multi-use pass redeemable for Middle Passage and valid for one year after its first use.

High Passage is first-class starship accommodation, providing passage from the current starport to the ship's next port of call. It has a value of Cr10,000.

Middle Passage is second-class starship accommodation, providing passage from the current starport to the ship's next port of call. It has a value of Cr8,000.

Low Passage is economy-class starship transportation, providing passage in Cold Sleep from the current starport to the ship's next port of call. It has a value of Cr1,000.

Pension x 2 doubles any final Pension the character receives from the career. Each doubling is of the original Pension: the first x2 doubles the Pension, the second x2 triples the pension, the third x3 quadruples the original Pension.

Retirement x 2 doubles any final Retirement Pay the character receives from any of the Armed Forces. Each doubling is of the original Retirement Pay: the first x2 doubles the Retirement Pay, the second x2 triples the Retirement Pay, the third x2 quadruples the original Retirement Pay.

Characteristic Improvements. Characteristic Improvements represent a final recognition of personal improvement based on the individual's career and experience.

Characteristic Improvements applied to Genetic Characteristics are recessive.

If the improvement is C6+1 and for the character C6= Caste, the benefit is lost.

Wafer Jack. A Wafer Jack is an implant allowing use of skill or personality wafers and direct access to computer systems.

Secrets. A Secret is some object or thing the character finds in his possession: it may be something in his files, or taken from the bottom of a drawer, or a memento.

The significance of the object is controlled by the referee in the course of later events.

A Secret is the spark that can begin an adventure. Its description is just enough to direct the adventurers' attention toward some goal. It is a secret because of its importance, and because it is generally shared or discussed only with persons (comrades) who can be trusted.

Forbidden Knowledge. Forbidden Knowledge is a skill or knowledge that is not, should not, or cannot be mentioned in polite society.

FORBIDDEN KNOWLEDGE

1D	Skill	Considered uncouth in polite society because:
1	Fighting	It accepts violence and weapons as a means of achieving goals.
2	Streetwise	It implies an interaction with the lower or fringe social classes.
3	Stealth	It accepts covert and possibly illegal actions as a means to achieving goals.
4	Explosives	It accepts large scale destruction as a means of achieving goals.
5	WMD	It accepts massive indiscriminant violence as a process for achieving goals.
6	Programmer	It accepts bypassing of computer safeguards as a process for achieving goals.

For example, the fact that a character is familiar with the use of machineguns (Fighting) is not usually brought up in conversation. Each receipt provides skill-1.

Knighthood. The character receives a Knighthood (= Soc B if the character has C6 = Soc).

A character who does not have Soc (C6= Caste or C6= Charisma) nonetheless receives the benefits of Knighthood (the name prefix Sir and a certain level of prominence in society), he just doesn't really care.

Note that a Career Skills Table C6+1 may increase Soc to B or higher. A Knighthood raises any value Soc to B; if the character is already Soc 11+, he receives Soc +1 instead.

In the Armed Forces, Knighthood is only available to Officers. A non-officer receives Soc +1. A character with Soc = 11+ already receives Soc +1 instead.

Some Social Standing values are divided into lower and upper case (c= baronet; C= Baron; e= Viscount; E= Count; f= Duke; F = Duke). Treat each internal division for the purposes of increases in Soc.

Life Insurance. Life Insurance is the archiving of a personality scan and DNA (or equivalent) sample during the Mustering Out Process. It enables the creation of a Clone and Implantation of the character's personality, in the event that a notification of death reaches the archive. Notice that unless updated, the replacement clone will revert to the memories and skills recorded at Mustering Out.

Travellers Aid Society. The **TAS** is non-governmental organization devoted to assisting travelers in need. It is also a hospitality provider with hotels, restaurants, banking, and library data facilities on most Starport-A and Starport-B worlds.

TAS Fellowship. A TAS Fellow Membership is a temporary membership in the Travellers' Aid Society. The membership provides one week of accommodations and one High Passage per month (they accumulate if not taken). The grant expires four years after award (at which point accumulated benefits expire).

TAS Life Membership. TAS Life Membership is a permanent membership in the Travellers' Aid Society. The membership provides one week of accommodations and one High Passage per month (they accumulate if not taken).

Directorship. A Directorship is an appointment to the Board of Directors of a large (world-wide or system-wide) corporation. The appointment is largely ceremonial, requiring only annual attendance at Board meetings.

A directorship provides an annual payment of Cr36,000, high level access to business executives, and deferential treatment at company facilities. Create a name for the Company involved: for example: the <worldname> Corporation.

Ship Shares. Each ship share represents a fractional ownership in a starship. It may be redeemed upon Mustering Out, or it may be retained and redeemed at some later date.

Proxy. A Proxy is a delegation of power (usually to vote in the Moot) by one Noble to another. The number of Proxies a Noble holds is an indication of his Political Power.

Nobles uninvolved in the political process transfer their voting rights to a political Noble based on family ties, financial or other rewards, or even political considerations.

Duplicate Benefits

If a result duplicates a benefit previously received (and it is unwanted or unusable), the character may reroll until a different benefit is received.

Unusable duplicate benefits include: Wafer Jack, TAS Life Member. The individual may decide for himself if additional x2 Pension or additional x2 Retirement Pay is unusable.

ENTITLEMENTS

When a character ends the Character Generation process, he may be eligible for specific Entitlements if he meets specific requirements. Entitlements include Pensions, Retirement Pay, and Life TAS Memberships:

Duplicate Entitlements: A character may have duplicate Entitlements (for example, both a Reserve and a Functionary pension, or both Military and Professor's retirement pay).

Getting Paid. Any Entitlement may be collected at any Travellers' Aid Society office (at smaller offices, it may take a few days). Entitlements are paid in advance: the payment is made on the first day of retirement and annually thereafter.

Cashing Out. A character may not want to wait until Life Stage 9 to retire. Any Entitlement can be cashed out for a lump sum equal to five years of payments.

Pensions

Pensions are available for some careers. A pension begins when a character reaches Life Stage 9 Retirement (= age 66 for Humans).

Citizen's Pension. Any character who has been a Citizen or Functionary for at least one Term is eligible for a Citizen's Pension. A Citizen receives Cr10,000 per year; a Functionary receives Cr15,000 per year (which replaces a Citizen's pension, if any).

Reserve Pension. A character who served in the Reserves receives an annual Reserve Pension (= Cr100 per term served in the Reserves).

Professor's Pension. A tenured Professor receives a Professor's Pension of Cr10,000 per year.

Retirement Pay

The Army, Navy, and Marines have retirement programs for those who served on active duty (not the reserves) for at least 5 terms. Military Retirement Pay is determined based on total combined terms served in Army, Navy, and Marines.

Enlisted Retirement. A Soldier, Spacer, or Marine with at least 5 terms served receives an annual payment of Cr2,000 per term in the service.

Officer Retirement. A Soldier, Spacer, or Marine with at least 5 terms served who musters out as an Officer receives an annual payment of Cr3,000 per term in the service.

TAS Life Membership

A Life Membership provides one week of accommodations and one High Passage per month. Selected individuals are awarded a **TAS Life Membership.**

- Award Winning Scholar.
- Scout with 3 Discoveries.
- Imperial Treasure Craftsman.
- Starburst for Extreme Heroism
- Starburst for Extreme Heroism with Diamonds.

REDEEMING SHIP SHARES

Ship shares can be redeemed for a ship of the appropriate type. Redeemed shares convey the appropriate percentage ownership; the remainder must be financed and is subject to monthly payments.

Ship shares can be acquired in many different career paths. They may be redeemed based on specific careers served in.

Scout Ships

An ex- Scout can redeem **one share** for a standard Scout Ship. The ship is on long-term loan and the user is subject to occasional mission assignments from the Scout Service.

Escort Ships

An ex- Navy officer can redeem **one share** for a standard Escort Ship. The ship is on long-term loan and the user is subject to occasional mission assignments from the Navy.

Yachts

A noble (Social Standing B or higher) or an Entertainer (with Fame-17+) can redeem **three shares** for a standard Yacht. The ship is on long-term loan from a patron or admirer.

Lab Ships

A Scholar can redeem three shares for a standard Lab Ship. The ship is on long-term loan subsidized by a corporate grant.

Traders

Any character may exchange any available shares for an equal number of shares in the available types of Trader.

Free Trader	10 Shares
Fat Trader	12 Shares
Far Trader	14 Shares
Flat Trader	16 Shares

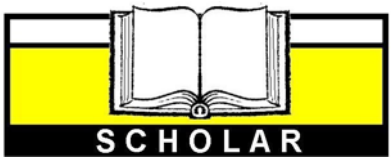
A ship owner (or the recipient) is responsible for the (operating and other) costs associated with the ship.

A character using shares to acquire less than total ownership of a ship must finance the remaining portion. For example, a Free Trader requires 10 shares. A character with 3 shares could acquire 30% ownership and would be required to finance the remaining 70% of the ship.

Pooling. Several characters with Ship Shares may pool their resources to acquire a ship, and they take ownership in proportion to their shares.

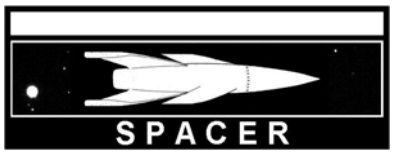
13 Careers

Someone who serves in an army or fighting force. A fighter. A warrior.



One who, through long study, has gained a mastery of one or more areas of academic study. A learned person.

One who, by birth or other process, owes loyalty to a state, nation, or world. A resident. A civilian. An average person.



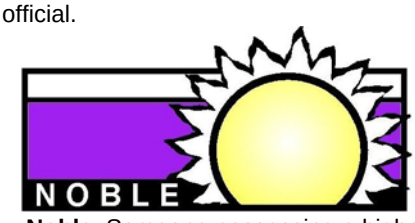
One who serves in a navy or works on an armed (star) ship or (space) ship.

One who uses his talents or abilities in performance. A person who participates in the arts.

One who holds an office or a trust or performs a particular function; an official.

A member of a specially trained or specially selected fighting force.

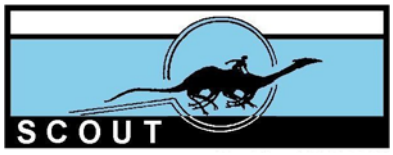
A skilled worker. An artificer; a mechanic; an artisan. A professional with great skill in the manual arts.



Noble. Someone possessing a higher level rank in a political or social class system.

Someone who engages in the business; a shopkeeper. Especially, the operator of a (star) ship engaged in trade and commerce.

A deceitful, unreliable person; a scoundrel or rascal. A mischievous scamp. A trickster. A traitor, or rebel.



One who travels to unknown territory. An explorer.

One with power to act for another, especially for a megacorporation or a government. A spy.

Citizens

Which career should you play? If you can't decide, then you should become a Citizen. There's a chance you will find a career or a hobby that will bring out your true potential.

Citizen: One loyal to the state. Employee, Civilian, Clerk, Resident.

CITIZENS	
To Begin	automatic
Citizen Life	Str C2 C3 Int
Continue	10

THE ULTIMATE ADVENTURE

When a Citizen fails his **Continue** roll, he has lost his Job and is thrust out into the role of a player-character…

SKILL ELIGIBILITY	
Per Term	4 Skills
Job	Skill-4 *
Hobby	Skill-2 *
*on first receipt; Skill-1 thereafter.	

MUSTERING OUT BENEFITS		
1D	Money	Benefits
2	Cr 5,000	Secret
3	Cr 10,000	Wafer Jack
4	Cr 15,000	Str +1
5	Cr 20,000	C2 +1
6	StarPass	C3 +1
7	Cr 30,000	Int +1
8	Cr 40,000	Life Insurance
9	Cr 50,000	Soc +1
10	Cr 50,000	TAS Fellow
DM +Terms		

CAREER CHANGE OPTIONS
Scholar, Entertainer, Craftsman, Scout, Merchant, Spacer, Soldier, Noble, Marine, Functionary.
subject to eligibility

CITIZEN LIFE						
		C					
A	B	1	2	3	4	5	6
1	1	Recon	Aeronautic	Admin	Advocate	SoundMimi	ACV
1	2	Spines	Aquanautic	Artillery	Artist	Biologics	Author
1	3	Sensors	Automotive	Astrogation	Beams	Computer	Broker
1	4	Actor	Bureaucrat	Craftsman	Compute	Driver	Mole
1	5	Flyer	BattleDress	Dancer	Diplomat	Explosives	Medic
1	6	Empath	Engineer	Designer	Exotics	G-Drive	Grav
2	1	Flapper	Fluidics	Electronic	Forensics	J-Drive	Math
2	2	Leader	Hvy Wpn	Engineer	Legged	Liaison	JOT
2	3	Tracked	Launcher	Gravitics	Mechanic	Athlete	Trader
2	4	Pilot	Magnetics	Hostile Env	Ordnance	Blades	LTA
2	5	Animals	Life Spt	Language	P-Plant	Counsellor	Sail
2	6	Tactics	Photonics	Musician	Sapper	Ortillery	Ship
3	1	Turrets	Programm	Strategy	Small Craft	Fighting	Rotor
3	2	Seafarer	Slug Throw	M-Drive	Stealth	Chef	Rider
3	3	Survey	Naval Arch	Navigate	Survival	Wheeled	Sprays
3	4	Comms	Streetwise	Polymers	Trainer	Screens	Sub
3	5	Teacher	Teamster	Spacecraft	Animals	Steward	Wing
3	6	Unarmed	Vacc Suit	Starships	No Skill	Zero-G	WMD
Roll A ((reroll if >3), Roll B, Roll C.							

CITIZEN LIFE

The focus of the Citizen is participation in local society.

If Citizen Life is Successful…

The Citizen's first Success provides a Job, randomly rolled (with Dice A, B, C) on Citizen Life, and he receives Skill-4 (subsequent receipts provide Skill-1).

The Citizen's second Success provides a Hobby, selected by the player from Citizen Life; he receives Skill-2 (subsequent receipts are Skill-1).

Once determined, Job and Hobby cannot be changed. In subsequent Terms, successes alternate in providing Job or Hobby skills

If Citizen Life Fails…

The Citizen continues the term stuck in a dull, boring, unfulfilling life (and receives no Job or Hobby skills), hoping that someday things will be different.

CITIZEN SKILLS

	1 Personal	2 Academic	3 Travel	4 Desk Job	5 Interaction	6 Vocation	7 Avocation	
1	C1 +1	Major*	Seafarer	Admin	Counsellor	Job***	One Art	1
2	C2 +1	Major*	Vacc Suit	Advocate	Designer	Job***	One Science	2
3	C3 +1	Major*	Flyer	Broker	Forensics	Job***	One Trade	3
4	C4 +1	Minor*	Driver	Bureaucrat	Gambler	Job***	Athlete	4
5	C5 +1	Minor*	Navigation	Comms	Streetwise	Job***	Hobby****	5
6	C6** +1	Minor*	Survival	Computer	Teacher	Job***	Hobby****	6

*If the character does not have a Major/Minor this benefit is lost. **If the character has C6=Caste, this benefit is lost.
***If the character does not have a Job, this benefit is lost. ****If the character does not have a Hobby, this benefit is lost.

Scholars

Which career should you play? If you want to explore the realms of research and knowledge, then Scholar is the answer.

Scholar: A master of an area of academic study. A learned person. Teacher. Professor. Researcher. Scientist.

SCHOLARS	
To Begin	Edu or Tra
Risk and Reward	Str C2 C3 Int
Scholar Promotion	Int (if Edu 8+)
	Mod +1 per Pub
Tenure	Publication x 3
Continue	Edu
	Mod +1 per Pub

SKILL ELIGIBILITY	
Per Term	4 skills
Per Promotion	1 skill
Successful Research	Major +2

MUSTERING OUT BENEFITS		
1D	Money	Benefits
1	Low Psg	C5 +1
2	Mid Psg	Wafer Jack
3	High Psg	Edu +1
4	Cr 15,000	Str +1
5	StarPass	C2 +1
6	Cr 25,000	C3 +1
7	Cr 30,000	Int +1
8	Cr 35,000	Fame +1
9	Cr 40,000	Ship Share
10	Cr 50,000	Life Insurance
DM + Scholar Level		

CAREER CHANGE OPTIONS
Citizen, Entertainer, Craftsman, Scout, Spacer, Soldier, Rogue, Noble, Marine, Functionary.
subject to eligibility

TABLE OF SCHOLAR RANKS			
	Level	Title	
X	ScholarX	Non-Traditional	If C5 = Tra. Scholar Level = 0.
0	Scholar0	Amateur	If less than Edu 8.
1	Scholar1	Lecturer	Automatic if Edu 8.
2	Scholar2	Instructor	
3	Scholar3	Assistant Professor	Eligible for Tenure.
4	Scholar4	Associate Professor	
5	Scholar5	Professor	
6	Scholar6	Distinguished Professor	
Each title is <of Major>.			

THE SCHOLAR'S MAJOR

Every Scholar has a Major and a Minor. If no degree (and an associated Major and Minor) then select any Skill, Knowledge, or Talent from the Skills List.

Scholar Position and Promotion. A Scholar with Edu 8+ is automatically Scholar1 when he Begins. Promotion is available only those with Edu 8+.

Amateur Scholars (Scholar0). A character with Edu 7 or less is an Amateur Scholar. He can resolve Risk and Reward, but is ineligible for Promotion.

Non-Traditional Scholars (ScholarX). A character with C5= Tra is a Non-Traditional Scholar. He can resolve Risk and Reward, but is ineligible for Promotion. A character with C5= Ins cannot become a Scholar.

Waivers. A Scholar attending who receives an adverse die roll or decision (in Prerequisite, Admission, Pass/Fail, Honors) may try for a Waiver. Check Soc (2D); Mod minus number of previous waivers (successful or not). Waivers are unique to the Education Process and apply only to Schools and Education (and the Scholar career, but not other careers).

THE SCHOLAR'S LIFE

The focus of the Scholar's life is research (=risk) and publication (=reward).

If The Risk Roll Fails… The Scholar's Research has been unproductive. There are no results to publish. The Reward roll cannot be made.

If The Reward Roll Succeeds… The Scholar successfully publishes the results of his research. He adds one Publication to his record.

Award Winning. If Characteristic minus Reward roll (disregarding Mods) is 4 or more, the Publication is <Award-Winning> and counts as TWO Publications.

PROFESSORSHIP AND TENURE

A Scholar with Edu 10+ may apply for Tenure upon reaching Scholar3 and in every Term in which the Character is Scholar3 (Promotion beyond Scholar3 is not possible without Tenure).

SCHOLAR SKILLS

	1 Personal	2 Academic	3 Travel	4 Day Job	5 Night Job	6 Vocation	7 Avocation	
1	C1 +1	Major	Seafarer	Programmer	Broker	Academia	One Art	**1**
2	C2 +1	Major	Navigation	Designer	Trader	Comms	One Science	**2**
3	C3 +1	Major	Astrogation	Medic	Language	Forensics	One Trade	**3**
4	C4 +1	Minor	Survival	Diplomat	Craftsman	Teacher	Athlete	**4**
5	C5 +1	Minor	Survey	Advocate	Driver	Survey	Animals	**5**
6	C6* +1	Minor	Vacc Suit	Counsellor	Flyer	Bureaucrat	Gambler	**6**

*If the character has C6=Caste, this benefit is lost.

Entertainers

Which career should you play? If you enjoy performing and want to travel the universe, then Entertainer is the answer.

Entertainer: A Performer. A person who participates in the arts. Actor. Writer. Dancer. Storyteller. Shugilii. Singer. Musician. Chef.

ENTERTAINERS	
Actor To Begin	C2 or C3
Artist To Begin	Str or C2 or C3
Author To Begin	Int or C5
Dancer To Begin	C2 or C3
Musician To Begin	C2
Chef To Begin	C2
Determine Fame for the Term	
Continue	Fame

SKILL ELIGIBILITY	
Per Term	4 skills
Per Good Review	2 skill

MUSTERING OUT BENEFITS		
1D	Money	Benefits
2	Low Psg	Secret
3	Mid Psg	Wafer Jack
4	High Psg	C5 +1
5	Cr 10,000	Str +1
6	StarPass	C2 +1
7	Cr 30,000	C3 +1
8	Cr 40,000	Int +1
9	Cr 50,000	Ship Share
10	Cr 60,000	Life Insurance
11	Cr 70,000	TAS Fellow
DM + Terms		

CAREER CHANGE OPTIONS
Citizen, Scholar, Craftsman, Spacer, Soldier, Noble, Marine, Functionary.
subject to eligibility

ENTERTAINER SPECIALTIES	
State A Specialty:	
1	**Artist**. Painter. Videographer. Sculptor.
2	**Actor.** Voice. Broadcaster. Orator.
3	**Author.** Writer. Journalist. Reporter.
4	**Dancer.** Choreographer.
5	**Musician.** Singer. Instrumentalist.
6	**Chef.** Smell Artist. Shugilii. Osmancer.

THE ENTERTAINER'S GOAL

An Entertainer's success depends entirely on his reputation: his Fame.

Stage or Artist's Name. An Entertainer with Fame 10+ should create a stage name. If Fame 12+ it should be a single name.

CALCULATING FAME	
At Start	**T** Talent = 2D (+ Flux [optional])
Every Term	**P** Performance = 2D **R** Reviews = (Performance-Talent) /2 **F** Fame = Talent + All Reviews **T** Adjust Talent + Review
Once	**The Big Break** Increase Fame OR Performance +D
Round to the character's advantage	

CALCULATING ENTERTAINER FAME				
	T	**P**	**R**	**F**
Term	Talent=	Perfor=	Review=	Fame=
1	2D	2D	(P-T)/2	T+R(1)
2	T1 + R1	2D	(P-T2)/2	T2+R(1,2)
3	T2 + R2	2D	(P-T3)/2	T3+R(1,2,3)
Round to the character's advantage				

FAME	
F	Description
0	Unknown
1	Mother
2	Close Family
3	Family
4	Neighborhood
5	Town
6	City
7	Urban
8	Regional
9	Continental
10	World
11	World Complex
12	World System
13	Inner System
14	Outer System
15	Remote System
16	Neighbor Systems
17	Several Systems
18	Many Systems
19	Subsector
20	Sector
21	Sectors
22	Domain
23	Domains
24	Empire
25	Beyond Empire
26	Several Empires
27	This Spiral Arm
28	Many Spiral Arms
29	The Galaxy
30	Several Galaxies
31	Many Galaxies

ENTERTAINER SKILLS								
	1 Personal	**2** Academic	**3** Travel	**4** Interaction	**5** Business	**6** Vocation	**7** Avocation	
1	C1+1	Major*	Zero-G	Comms	Comms	Performer	One Art	**1**
2	C2+1	Major*	Hi-G	Computer	Bureaucrat	One Art	One Science	**2**
3	C3+1	Minor*	Hostile Env	Advocate	Diplomat	One Art	One Trade	**3**
4	C4+1	Minor*	Flyer	JOT	Leader	New Art***	Athlete	**4**
5	C5+1	One Trade	Driver	Language	Liaison	New Art***	Animals	**5**
6	C6** +1	One Trade	Vacc Suit	Streetwise	Trader	New Art***	Gambler	**6**

*If the character does not have a Major/Minor this benefit is lost. **If the character has C6=Caste, this benefit is lost.
***Any Art not already held; if all 6 are already held; this benefit is lost.

Entertainer Fame

Entertainer Fame is a special case: its calculation is complex to reflect the interaction of Talent, Accomplishment, and Expectations.

Entertainer Fame

ENTERTAINER FAME

Fame is the central focus of the Entertainer career. It controls continuing in the career and it reflects the Entertainer's overall success.

At The Start Of The Career. The character rolls 2D for **Talent**. The character, in addition, has the option of adding Flux to this roll.

Every Term. In the course of each Term as an Entertainer, the player makes a series of Performances, which are then critically reviewed, and which translate into current Fame. For a musician, Performances are the concerts and recordings he makes; for an artist, they are his paintings or sculptures; for a chef, they are the gourmet meals he prepares.

Performances. Roll 2D for the relative value of the Performances for the Term. Higher values are better.

Reviews. Critics (consumers and media) evaluate Performances for their intrinsic value and in light of their expectations. Critics often have higher expectations for those with greater Talent. Reviews equal Performance minus Talent divided by two.

Current Fame. The Entertainer's current Fame at the end of the Term is Talent plus all Reviews (all Reviews ever received).

Adjusted Talent. After Fame is calculated, Talent is adjusted to reflect the Reviews for the Term.

CALCULATING FAME	
At Start	**T** Talent = 2D (+ Flux [optional])
Every Term	**P** Performance = 2D **R** Reviews = (Performance-Talent) /2 **F** Fame = Talent + All Reviews Adjust Talent + Review
Once	The Big Break. Increase Fame +D
Round to the character's advantage	

CALCULATING FAME

	Talent	Performance	Reviews	Fame	Adjusted Talent
		2D	=(P-T)/2	=T+Rs	=T+R
Term	T	P	R	F	aT
1					
2					
3					
4					
5					
6					

CALCULATING FAME FOR DIVA

	Talent	Performance	Reviews	Fame	Adjusted Talent
		2D	=(P-T)/2	=T+Rs	=T+R
Term	T	P	R	F	aT
1	7	8	1	8	8
2	8	8	0	9	8
3	8	8	0	9	8

FAME	
F	Description
0	Unknown
1	Mother
2	Close Family
3	Family
4	Neighborhood
5	Town
6	City
7	Urban
8	Regional
9	Continental
10	World
11	World Complex
12	World System
13	Inner System
14	Outer System
15	Remote System
16	Neighbor Systems
17	Several Systems
18	Many Systems
19	Subsector
20	Sector
21	Sectors
22	Domain
23	Domains
24	Empire
25	Beyond Empire
26	Several Empires
27	This Spiral Arm
28	Many Spiral Arms
29	The Galaxy
30	Several Galaxies
31	Many Galaxies

Entertainer Fame is calculated using the Entertainer Fame process.

THE FAMOUS SINGER DIVA

For example, Diva is a singer with Talent=7. Up until this point, she is an unknown.

In her first Term, she rolls Performance =8. Her Reviews = (8 - 7) /2 = 1/2 rounded to 1. Her Fame at the end of the Term is (7 + 1=) 8 (she is known Regionally). Her Talent-7 is adjusted by her Reviews to (7 + 1) = 8.

In her second Term, she rolls 2D for Performance = 8. Her Reviews = (8 - 8) / 2 = 0. Her Fame at the end of the Term is 8 + 1 + 0 = 9 (and is known Continentally). Her current Talent-8 is adjusted by her current Reviews-0 and remains Talent-8.

In her third Term, she rolls 2D for Performance = 8 (she's consistent at least). Her Reviews = (8 - 9) / 2 = - 1/2 rounded to 0. Her Fame at the end of the third Term is 8 + 1 + 0 + 0= 9 (unchanged). Her current Talent-8 is adjusted by her current Reviews-0 and remains Talent-8.

Craftsmen

Which career should you play? If you want to create new high quality objects, then you should be a Craftsman.

Craftsman: A skilled creator. An artisan. A master of a trade or manual art. An artificer. A craftsperson. A craftsophont.

Craftsman
is never a first career.

CRAFTSMAN	
To Begin	Automatic*
Masterpiece	Str C2 C3 Int
Continue	Craftsman x 2
*If TWO Skill-6+ and Craftsman-1+	

SKILL ELIGIBILITY	
Per Term	4 skills
Per Success	1 skill
Per Success	Craftsman-3
Per Failure	Craftsman-1

MUSTERING OUT BENEFITS		
1D	Money	Benefits
2	Low Psg	Forbidden Knowle
3	Mid Psg	Wafer Jack
4	High Psg	C5 +1
5	Cr 15,000	Str +1
6	StarPass	C2 +1
7	Cr 25,000	C3 +1
8	Cr 30,000	Int +1
9	Cr 35,000	Ship Share
10	Cr 40,000	TAS Fellow
DM + Terms		

CAREER CHANGE OPTIONS
Citizen, Scholar, Entertainer, Spacer, Soldier, Rogue, Noble, Marine, Functionary.
subject to eligibility

THE CRAFTSMAN'S PASSION

The focus of a Craftsman's activity is creating Masterpieces.

The Controlling Characteristic governs creating the current Masterpiece (and cannot be used again until all of the others have been used as well).

Master Points. In each Term, the Craftsman totals available Master Points which will be used toward the current Masterpiece. Roll 9D for Masterpiece Points or less for success in creation. If the Craftsman cannot show at least 40 Masterpiece points, he cannot attempt a Masterpiece (treat as failure).

MASTER POINTS	
Master Points =	Controlling Characteristic Craftsman Up to FIVE skills at Skill-6+
9D <	**Master Points**
Masterpiece attempt not possible if Master Points <40.	

For example, the Craftsman has 45 Master Points when creating a Masterpiece; he must roll 45 or less (on 9D) for success.

If The Creation Is Successful,

A beautiful Masterpiece has been created. Name an object capable of being lifted or carried by the Character, and reasonably created using the Skills applied. Allocate the Masterpiece points to QREBS (for the ranges -5 to +5, -5 = 1 point; +5 = 11 points). If all QREBS values are set at the Maximum, excess Master Points can be allocated equally in excess of +5.

A Perfect Masterpiece has 55 or more Master Points.

If The Creation Fails,

The Craftsman receives Craftsman +1 (it's called learning from experience).

The Value of a Masterpiece

The Craftsman has spent most of three years conceiving and creating the Masterpiece. Simple living expenses and cost of labor (=Cr25 an hour for 6000 hours) puts the cost of the Masterpiece at Cr150,000. The Masterpiece can be sold at Cr150,000 plus Cr10,000 per Master Point over 39. A Perfect Masterpiece (=55 points) sells for Double (= Cr600,000).

Vintage Masterpieces. A Masterpiece increases in value about 5% per year, but are subject to Flux when sold.

CRAFTSMAN SKILLS

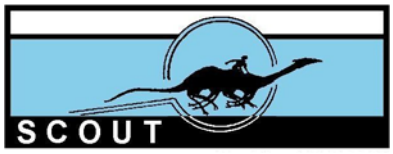
	1 Personal	2 Academic	3 Travel	4 General	5 Business	6 Vocation	7 Avocation	
1	C1 +1	Major*	Seafarer	Animals	Comms	One Art	One Art	1
2	C2 +1	Major*	Navigation	Comms	Bureaucrat	One Trade	One Science	2
3	C3 +1	Minor*	Hostile Env	Designer	Diplomat	One Trade	One Trade	3
4	C4 +1	Minor*	Flyer	Computer	Leader	New Trade***	Athlete	4
5	C5 +1	One Trade	Driver	Designer	Liaison	New Trade***	Animals	5
6	C6** +1	One Trade	Vacc Suit	Designer	Trader	Naval Architect	Gambler	6

*If the character does not have a Major/Minor this benefit is lost. **If the character has C6=Caste, this benefit is lost.
***Any Trade not already held; if all are already held; this benefit is lost.

Scouts

Which career should you play? If you want to discover and explore fascinating new worlds, then Scout is the answer.

Scout: One engaged in exploration, mapping, and development of a territory. Explorer. Courier. Hunter. Runner. Messenger. Prospector.



SCOUTS	
To Begin	6
To Retry	C5
Risk and Reward	Str C2 C3 Int
Continue	Int
	Mod +1 per Term

SCOUT RANKS

Scouts do not have Rank.

SANITY

Because of the long-term isolation a Scout must endure, reduce San by -1 for each TWO Terms served.

SKILL ELIGIBILITY	
Per Term	8 skills
OR- If Courier Duty	4 skill

MUSTERING OUT BENEFITS		
1D	Money	Benefits
2	Low Psg	Wafer Jack
3	Mid Psg	C5 +1
4	Mid Psg	Str +1
5	Cr 15,000	C2 +1
6	StarPass	C3 +1
7	Cr 25,000	Int +1
8	Cr 30,000	Ship Share
9	Cr 35,000	Life Insurance
10	Cr 40,000	Soc +1
11	Cr 45,000	TAS Fellow
12	Cr 50,000	Fame +2
13	Cr100,000	Knighthood
DM + Terms		

CAREER CHANGE OPTIONS

Citizen, Scholar, Entertainer, Craftsman, Spacer, Soldier, Rogue, Noble, Marine, Functionary.

subject to eligibility

THE SCOUT'S DUTIES

The Scout is a solitary explorer, equipped with a small ship and a hold full of supplies, sent to seek out and explore new worlds. Scouts are also tasked with courier duties: carrying messages and data between worlds.

THE SCOUT'S LIFE

The focus of the Scout's life is consumed with long voyages beyond the borders of civilization: the risky flights just may discover that one world in a thousand that holds great reward.

Avoiding Risk. A Scout may avoid the Risk Roll (and the Reward Roll) by volunteering for Courier Duty.

If The Risk Roll Fails…

The Scout is injured (hit points equal to the difference between the roll and the characteristic). Roll for recovery (= 1D, but not to exceed original injury). Unrecovered injury permanently reduces the characteristic.

Service May End. Permanent injury of 3 points or more (even if from more than one injury) **requires** a disability discharge. Roll 1D for the number of years served in the current term (maximum 4 years) and receive double mustering out benefits.

If The Reward Roll Succeeds…

The Scout is recognized as the Discoverer of a valuable new world or a valuable feature on a known world (a Discovery).

Name the Discovery. Create and name the Discovery. It is traditional for the first discovered world or feature to be named *by* the Discoverer.

The Discoverer receives Fame +4.

Landgrant. The Scout receives a Land Grant.

SCOUT SKILLS

	1 Personal	2 Academic	3 Space	4 Surface	5 Conflict	6 Vocation	7 Avocation	
1	C1 +1	Major*	Astrogation	Navigation	Fighting	Scout	One Art	1
2	C2 +1	Major*	Zero-G	Hostile Env	Fighting	Survey	One Science	2
3	C3 +1	Minor*	Vacc Suit	Animals	Gunner	Survival	One Trade	3
4	CS (San) +1	Minor*	Pilot	Survey	Gunner	Starship Skill	Athlete	4
5	C5 +1	One Trade	Driver	Seafarer	Heavy Wpns	Starship Skill	Animals	5
6	C6** +1	One Trade	Vacc Suit	Driver	Heavy Wpns	Starship Skill	Gambler	6

*If the character does not have a Major/Minor this benefit is lost. **If the character has C6=Caste, this benefit is lost.

Merchants

Which career should you play? If you want to travel, picking and choosing which world to visit next, then Merchant is the answer.

Merchant: The operator of a (star) ship engaged in trade and commerce. Trader. Broker. Entrepreneur.

MERCHANTS	
To Begin	Int
Risk and Reward	Str C2 C3 Int
Rank 0 Promotion	9
	Mod +2 if Int 6+
Officer Promotion	Terms x 2
	Mod +3 if Int 8+
Continue	Str

SKILL ELIGIBILITY	
Per Term	4 skills
When Promoted	1 Skill
Automatic	By Rank

MUSTERING OUT BENEFITS		
1D	Money	Benefits
1	StarPass	Forbidden Knowle
2	High Psg	Secret
3	High Psg	Wafer Jack
4	Cr 15,000	Str +1
5	StarPass	C2 +1
6	Cr 25,000	C3 +1
7	Cr 30,000	Int +1
8	Cr 35,000	Ship Share
9	Cr 40,000	Life Insurance
10	Cr 45,000	Directorship
11	Cr100,000	TAS Fellow
DM + Rank		

CAREER CHANGE OPTIONS
Citizen, Scholar, Entertainer, Craftsman, Scout, Spacer, Soldier, Rogue, Noble, Marine, Functionary.
subject to eligibility

TABLE OF MERCHANT RANKS				
	Level	Title		Automatic Skill
0	Merchant0	Officer Apprentice	automatic	
1	Merchant1	4th Officer		Steward
2	Merchant2	3rd Officer		Engineer
3	Merchant3	2nd Officer		Astrogator
4	Merchant4	First Officer		Pilot
5	Merchant5	Captain		
6	Merchant6	Senior Captain		

THE MERCHANT'S GOAL

Every Merchant is working toward a specific goal: his own Free Trader. Risk and Reward for a Merchant are focused on accumulating shares in a merchant starship.

If The Risk Roll Fails…

The Merchant is injured (hit points equal to the difference between the roll and the characteristic). Roll for recovery (= 1D, but not to exceed original injury). Unrecovered injury permanently reduces the characteristic.

Service May End. Permanent injury of 3 points or more (even if from more than one injury) **requires** a disability discharge and double mustering out benefits.

If The Reward Roll Succeeds…

Every instance of Reward gives the character Ship Shares, redeemable toward ownership of a Trader, upon mustering out (a typical merchant starship has between 10 and 20 shares).

Escalating Ship Shares. The first Reward receipt provides one Share. The second receipt provides TWO Shares (and so on). The fifth receipt of a Share provides 5 Shares.

MERCHANT SKILLS

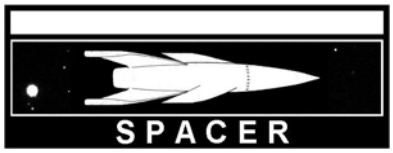
	1 Personal	**2** Academic	**3** Frontier	**4** Corporate	**5** Security	**6** Freighter	**7** Liner	
1	C1 +1	Major*	Zero-G	Admin	Fighting	Merchant	Steward	**1**
2	C2 +1	Major*	Vacc Suit	Broker	Fighting	Trader	Starship Skill	**2**
3	C3 +1	Minor*	Pilot	Trader	Gunner	Bureaucrat	One Trade	**3**
4	C4 +1	One Science	Starship Skill	Trader	Gunner	Computer	Language	**4**
5	C5 +1	One Trade	Comms	Driver	Driver	Starship Skill	Animals	**5**
6	C6** +1	One Trade	Gunner	Flyer	Flyer	One Art	Gambler	**6**

*If the character does not have a Major/Minor this benefit is lost. **If the character has C6=Caste, this benefit is lost.

Spacers

Which career should you play? If you want to see new worlds while serving the Empire, then you should be a Spacer.

Spacer. Someone who serves in a navy or works on an armed (star) ship. Naval Officer. Rating. Sailor (archaic).



SPACERS	
To Begin	C3
	Mod +2 if Edu 9+
Risk and Reward	Str C2 C3 Int
Rating Promotion	C2
	Mod + Rank
Commission	Int
Officer Promotion	Soc
	Mod +1 per Medal
Continue	Int

SKILL ELIGIBILITY	
Per Term	4 skills
When Commissioned	1 skill
When Promoted	1 Skill
Automatic	By Rank

MUSTERING OUT BENEFITS		
1D	Money	Benefits
1	Low Psg	Secret
2	StarPass	Wafer Jack
3	Mid Psg	Str +1
4	High Psg	C2 +1
5	Cr 20,000	C3 +1
6	Cr 25,000	Life Insurance
7	Cr 30,000	Ship Share
8	Retire x 2	Knighthood
DM + Officer Rank		

CAREER CHANGE OPTIONS
Citizen, Scholar, Entertainer, Craftsman, Rogue, Noble, Functionary.
subject to eligibility

TABLE OF NAVAL RANKS						
	Level	Rank	Auto Skill	Level	Rank	Auto Skill
1	Rating1	Spacehand	Fighting	Officer1	Ensign	Astrogation
2	Rating2	Able Spacehand		Officer2	Sublieutenant	
3	Rating3	PO Second		Officer3	Lieutenant	Engineer
4	Rating4	PO First	Gunnery	Officer4*	Lt Commander	Pilot
5	Rating5	Chief PO	Sensors	Officer5	Commander	
6	Rating6	Master CPO		Officer6	Captain	Leader
7				Officer7	Admiral	
				*Auto: Command College		

THE NAVAL CAREER

The focus of the Naval career is service: protecting and defending his homeworld and the Empire. Each term, he participates in naval operations.

At Begin, roll 1D (DM+2 if Edu 10+) for Branch. Officers may reroll Branch every Term. Ratings may reroll Branch when promoted.

Every Year, roll 1D (DM+2 if Edu 10+) for the type of Military Operation.

If The Risk Roll Fails…

The Spacer is wounded (hit points = C-R); recovery points = 1D (unrecovered injury is permanent) and receives a Wound Badge. Permanent injury of 3+ points **requires** disability discharge and awards double mustering out benefits.

If The Reward Roll Succeeds…

The spacer receives a Campaign Ribbon (name the campaign involved) and may consult the Medals Table if Battle, Strike, Siege, Patrol, or Mission.

NAVAL BRANCH				
D	Officers	Mod	Crew	Mod
1	Line	1	Crew	1
2	Line	1	Crew	1
3	Line	1	Engineering	0
4	Engineering	0	Engineering	0
5	Gunnery	1	Gunnery	1
6	Flight*	2	Gunnery	1
7	Technical	0	Technical	0
8	Medical	0	Medical	0
DM +2 if Edu 10+ *Auto if Pilot				

NAVAL OPERATIONS				
D	Officers	Mod	Crew	Mod
1	Battle	2	Battle	2
2	Strike	2	Strike	2
3	Siege	0	Siege	0
4	Patrol	1	Patrol	1
5	Mission	3	Shore Duty	0
6	ANM School	-	ANM School	-
7	Shore Duty	0	ANM School	-
8	Shore Duty	0	OCS	-
DM +2 if Edu 10+.				

The Mods shown (- for Risk; + for Reward) are required.

SPACER SKILLS

	1 Personal	2 Base	3 Patrol	4 Shore	5 Strike	6 Vocation	7 Technical	
1	C1 +1	Major*	Zero-G	Survey	Fighting	Navy	One Art	1
2	C2 +1	Major*	Vacc Suit	Survival	Fighting	Admin	One Science	2
3	C3 +1	Minor*	Pilot	Hostile Env	Flyer	Bureaucrat	One Trade	3
4	C4 +1	Minor*	Starship Skill	Animals	Stealth	Language	Athlete	4
5	C5 +1	One Trade	Gunner	Bureaucrat	Gunnery	Starship Skill	Seafarer	5
6	C6** +1	One Trade	Sensors	Navigation	Sensors	Comms	Gambler	6

*If the character does not have a Major/Minor this benefit is lost. **If the character has C6=Caste, this benefit is lost.

Soldiers

Which career should you play? If you want to visit new worlds while serving the Empire, then you should be a Soldier.

Soldier. One who serves in an army or fighting force. A fighter. A warrior. Militiaman. Man-at-arms.

SOLDIERS	
To Begin	Str
Risk and Reward	Str C2 C3 Int
Soldier Promotion	C2
	Mod +1 per WB
Commission	C3
Officer Promotion	Soc
	Mod +1 per Medal
Continue	7
	Mod + Terms

SKILL ELIGIBILITY	
Per Term	4 skills
When Commissioned	1 skill
When Promoted	1 Skill
Automatic	By Rank

MUSTERING OUT BENEFITS		
1D	Money	Benefits
1	Low Psg	Forbidden Knowle
2	Mid Psg	Secret
3	High Psg	Str +1
4	Cr 15,000	Life Insurance
5	StarPass	C5 +1
6	Cr 25,000	Wafer Jack
7	Cr 30,000	Int +1
8	Retire x 2	Knighthood
DM + Officer Rank		

CAREER CHANGE OPTIONS
Citizen, Scholar, Entertainer, Craftsman, Rogue, Noble, Functionary.
subject to eligibility

TABLE OF ARMY RANKS						
	Level	Rank	Auto Skill	Level	Rank	Auto Skill
1	Soldier1	Private	Fighting	Officer1	2nd Lieutenant	
2	Soldier2	Corporal		Officer2	1st Lieutenant	
3	Soldier3	Sergeant	Hvy Wpns	Officer3	Captain	
4	Soldier4	Staff Sergeant	Gunnery	Officer4*	Major	Flyer
5	Soldier5	Master Sergeant		Officer5	Lt Colonel	
6	Soldier6	Sergeant Major		Officer6	Colonel	Leader
7				Officer7	General	
				* Auto: Command College.		

THE ARMY CAREER

The focus of the Army career is keeping the peace and defending the Empire. Each term, he participates in military operations.

At the beginning, roll 1D (DM+2 if Edu 10+) for Branch. Officers may not change Branch. Soldiers may reroll Branch when promoted.

Every Year, roll 1D (DM+2 if Edu 10+) for the type of Military Operation.

If The Risk Roll Fails…

The soldier is wounded (hit points = C-R); recovery points = 1D (unrecovered injury is permanent). Permanent injury of 3+ points **requires** disability discharge and awards double mustering out benefits.

If The Reward Roll Succeeds…

The Soldier receives a Campaign Ribbon (name the campaign involved) and may consult the Medals Table if Battle, Combat, Insurgency, or Mission.

BRANCH		
D	Branch	Mod
1	Infantry	1
2	Infantry	1
3	Artillery	1
4	Cavalry	1
5	Protected	2
6	Commando	2
7	Technical	0
8	Medical	0
DM+2 if Edu 10+		

MILITARY OPERATIONS							
D	Inf Art Cav	Mod	Cdo Prot	Mod	Tech Med	Mod
1	Combat	2	Battle	3	Rear Area	0
2	Combat	2	Combat	2	Relief	1
3	Peace Keeper	1	Peace Keeper	1	Peace Keeper	1
4	Insurgency	1	Insurgency	1	Insurgency	1
5	Occupation	0	Mission	2	Mission	2
6	ANM School	-	ANM School	-	ANM School	-
7	ANM School	-	ANM School	-	ANM School	-
8	Garrison	0	Garrison	0	Garrison	0
DM +2 if Edu 10+						

The Mods shown (- for Risk; + for Reward) are required.

SOLDIER SKILLS

	1 Personal	2 Academic	3 Space	4 Surface	5 Conflict	6 Vocation	7 Avocation	
1	C1 +1	Major*	Zero-G	Driver	Fighting	Army	One Art	1
2	C2 +1	Major*	Vacc Suit	Flyer	Fighting	Fighting	One Science	2
3	C3 +1	Minor*	Computer	Vacc Suit	Heavy Wpns	Heavy Wpns	One Trade	3
4	C4 +1	Minor*	Starship Skill	Computer	Sapper	Gunnery	Athlete	4
5	C5 +1	One Trade	Gunner	Soldier Skill	Explosives	Explosives	Fighting	5
6	C6** +1	One Trade	Sensors	Medic	Battle Dress	Battle Dress	Gambler	6

*If the character does not have a Major/Minor this benefit is lost. **If the character has C6=Caste, this benefit is lost.

Agents

Which career should you play? If you want intrigue and adventure across a variety of situations, then you should be an Agent.

Agent. The representative of a government or powerful organization. Deputy. Operative. Samurai. Enforcer. Diplomat. Emissary. Paladin.

AGENT	
To Begin	C3
Risk and Reward	Str C2 C3 Int
Continue	Str
	Mod + Terms

SKILL ELIGIBILITY	
Per Term	2 Skills
Per Undercover	1 Skill
Per Successful Mission	4 Skill

MUSTERING OUT BENEFITS		
1D	Money	Benefits
2	Low Psg	Forbidden Knowle
3	Mid Psg	Secret
4	High Psg	Wafer Jack
5	Cr 15,000	Str +1
6	StarPass	C2 +1
7	Cr 25,000	C3 +1
8	Cr 30,000	Int +1
9	Cr 35,000	Ship Share
10	Cr 40,000	Life Insurance
11	Cr 45,000	Soc +1
12	Cr 50,000	Knighthood
DM + Terms and Commendations		

CAREER CHANGE OPTIONS
Citizen, Scholar, Entertainer, Craftsman, Spacer, Soldier, Rogue, Noble, Marine, Functionary.
subject to eligibility

UNDERCOVER OPERATIONS						
	Officer	Enlisted		Merchant		Noble
D	**1**	**2**	**3**	**4**	**5**	**6**
1	Army	Army	Citizen	4th Officer	Entertainer	Knight
2	Army	Army	Citizen	3rd Officer	Entertainer	Baronet
3	Marine	Marine	Functionary	2nd Officer	Scholar	Baron
4	Marine	Marine	Rogue	1st Officer	Scholar	Marquis
5	Navy	Navy	Scout	Captain	Craftsman	Viscount
6	Navy	Navy	Scout	Functionary	Craftsman	Count

AGENT MISSIONS

The focus of the Agent is completion of Missions. Each is a single Term in length: for the first half of the Term, the Agent is **Undercover**, serving in a different career (investigating, gathering information, preparing); in the second half of the Term, the Agent is completing the **Mission**.

Undercover (the Risk)

Roll D and D for Undercover career. Select (not Roll) one skill from the skill table of that Career.

If The Risk Roll Fails…

The Agent is injured (hit points equal to the difference between the roll and the characteristic). Roll for recovery (= 1D, but not to exceed original injury). Unrecovered injury permanently reduces the characteristic.

Service May End. Permanent injury of 3 points or more (even if from more than one injury) **requires** a disability discharge and awards double mustering out benefits.

Mission (the Reward)

Roll the Controlling Characteristic or less.

If the Reward Roll Succeeds…

Successful Agent activities are recognized and rewarded with Commendations: official documents which express the appreciation of the organizations involved. A Commendation is recorded as <Service> Commendation-N (N= Risk and Reward Characteristic minus Reward Roll [ignore any Mods]).

For example, If the Undercover Operation = Scout, Risk and Reward Characteristic=9, and the Reward Roll =5, he receives (=9 - 5 = 4):

Scout Commendation-4.

AGENT

	1 Personal	**2** Academic	**3** Space	**4** Interaction	**5** Conflict	**6** Vocation	**7** Avocation	
1	C1 +1	Major*	Zero-G	Language	Fighting	Agent	One Art	**1**
2	C2 +1	Major*	Vacc Suit	Leader	Fighting	Streetwise	One Science	**2**
3	C3 +1	Minor*	Computer	Liaison	Diplomat	Forensics	One Trade	**3**
4	C4 +1	Minor*	Starship Skill	Strategy	Liaison	Diplomat	Athlete	**4**
5	C5 +1	One Trade	Gunner	Survival	Counsellor	Liaison	Fighting	**5**
6	C6** +1	One Trade	Sensors	Tactics	Advocate	Stealth	Gambler	**6**

*If the character does not have a Major/Minor this benefit is lost. **If the character has C6=Caste, this benefit is lost.

Rogues

Which career should you play? If you delight in schemes and swindles, then you may already be a Rogue.

Rogue: A scoundrel, rascal, or deceiver. Knave. A Non Conformist. Scamp. Bandit. Highwayman. Pirate. Corsair. Brigand. Thief. Robber.

ROGUE	
Before Beginning: pick one Controlling Characteristic CC	
To Begin	CC
Risk and Reward	CC
	Mod - 2 per Term
Continue	CC
	Mod - 2 per Term
*Controlling Characteristic	

SKILL ELIGIBILITY	
Per Term	2 Skills
Abandoned Scheme	1 Skill
Successful Scheme	3 Skills
In Prison	1 Skill

MUSTERING OUT BENEFITS		
1D	Money	Benefits
2	Low Psg	Forbidden Knowle
3	Mid Psg	Secret
4	High Psg	Wafer Jack
5	Cr 15,000	C2 +1
6	StarPass	C3 +1
7	Cr 25,000	TAS Fellow
8	Cr 30,000	Life Insurance
9	Cr 35,000	Int +1
10	Cr 40,000	Directorship
11	Cr 50,000	Knighthood
DM + Terms		

CAREER CHANGE OPTIONS
Citizen, Scholar, Entertainer, Craftsman, Spacer, Soldier, Agent, Noble, Marine, Functionary.
subject to eligibility

ROGUE SCHEMES					
Choose one column and roll 1D					
1	Citizen	Cr 10,000*	1	Navy	Cr 30,000*
2	Scholar	Cr 20,000*	2	Army	Cr 30,000*
3	Entertainer	Cr100,000*	3	Agent	Cr100,000*
4	Craftsman	Cr100,000*	4	Noble	Cr200,000*
5	Scout	Type S Scout	5	Marine	Cr 30,000*
6	Merchant	1 Ship Share	6	Functionary	Cr 20,000*
		* times 1D			* times 1D

THE ROGUE

The focus of the Rogue is Schemes to amass wealth at the expense of others.

A Rogue selects one Controlling Characteristic which is use throughout his career.

In each Term, the Rogue masterminds a Scheme within another Career. He rolls on the Rogue Schemes table to determine its potential (the * times 1D roll is deferred until after the Scheme is determined to be Successful).

Rogue <Former Career>. A character who has become a Rogue from a previous career (Scholar, Craftsman, Scout, Merchant, Naval, Solider, Agent, or Marine) automatically picks that former career on the Rogue Schemes table.

If The Risk Roll Fails…

The Rogue is caught and serves the current Term and the next Term in Prison. He receives Fame +1 (actually Infamy, but he is more widely known than before). A Rogue who has served in Prison is ineligible for a Knighthood or Directorship mustering out benefit (substitute No Benefit).

If The Reward Roll Succeeds…

The Rogue's Scheme is successful. He rolls the * times 1D to determine the precise outcome.

ROGUE SKILLS

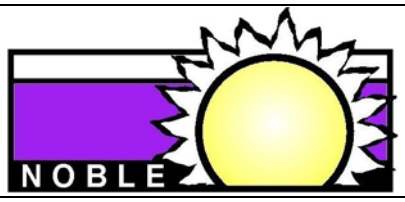
	1 Personal	2 Academic	3 Space	4 Interaction	5 Conflict	6 Vocation	7 Avocation	
1	C1 +1	Major*	Zero-G	Language	Fighting	Agent	One Art	1
2	C2 +1	Major*	Vacc Suit	Leader	Fighting	Streetwise	One Science	2
3	C3 +1	Minor*	Computer	Liaison	Diplomat	Forensics	One Trade	3
4	C4 +1	Minor*	Starship Skill	Strategy	Liaison	Diplomat	Athlete	4
5	C5 +1	One Trade	Gunner	Survival	Counsellor	Liaison	Fighting	5
6	C6* - 2	One Trade	Sensors	Tactics	Advocate	Stealth	Gambler	6

*If the character does not have a Major/Minor this benefit is lost. **If the character has C6=Caste, this benefit is lost.

Nobles

Which career should you play? If you want to be a socially powerful character with the freedom to travel, then Noble is the answer.

Noble. One with a higher rank in a political or social class system. Ruler. Politician. Chief. Dilettante. Heir. Heiress.



NOBLES	
To Begin	Automatic*
Return and Intrigue	C2 C3 Int C5
Elevation	Soc
	Mod - Intrigues
	Mod + Exiles
Continue	Soc

*If Soc A+

SKILL ELIGIBILITY	
Per Term	4 skills
When Elevated	2 skill

MUSTERING OUT BENEFITS		
1D	Money	Benefits
2	Cr 20,000	Wafer Jack
3	Cr 30,000	Str +1
4	StarPass*	C2 +1
5	StarPass*	C3 +1
6	StarPass*	Int +1
7	Cr100,000	Ship Share
8	Cr100,000	Proxy (2D)
9	Cr100,000	Proxy (2D)
10	Cr100,000	Life Insurance
11	Cr200,000	Int +1
12	Cr200,000	Directorship
13	Cr200,000	TAS Life Member
DM + Terms		

*Upgraded to High as a courtesy.

CAREER CHANGE OPTIONS
a Noble cannot change careers

TABLE OF NOBLE RANKS					
Soc	Title	TC*	Hexes	Where?	Base Fame
A	Gentleman	Any	1	Any	
B	Knight	Any	1	Homeworld	13
c	Baronet**	Pa, Pr	2	Same system	14
C	Baron	Ag, Ri	4	Same system	15
D	Marquis	Pi	8	Same Subsector	16
e	Viscount**	Ph	16	Same Subsector	17
E	Count	Hi	32	Same Sector	18
f	Duke**	In	64	Same Sector	19
F	Duke	Any	128	Same Sector	20

*** Preferred Worlds.** The Empire prefers to award noble titles associated with worlds with these Trade Classifications.

**** Similar Titles.** A Character with Soc C is initially a Baronet (and the first Elevation raises him to Baron). A Character with Soc E is initially a Viscount (and the first Elevation raises him to Count). A Character with Soc F is initially a Subsector Duke (and the first Elevation raises him to higher level Sector Duke).

NOBLE INTRIGUE

Intrigue is a political fight for some important policy within the government; intrigue is central to the life of the Noble.

Return From Exile. A Noble in Exile at the start of a Term rolls the current Controlling Characteristic to **Return from Exile**. If he fails, he may not roll for Intrigue or Elevation. Exile is a banishment of a noble to the edges of the empire (orchestrated by the political enemies).

Intrigue. A Noble (not in Exile) rolls the Controlling Characteristic. If he fails, he is sent into Exile and may not roll for Elevation.

ELEVATION

Elevation is Roll High (roll Soc or greater to be Elevated to the next higher Noble rank) and its associated increase in Social Standing (if any).

Total successful Intrigues (in the Noble's lifetime) is a Mod for Elevation.

Flux. Once during character generation after a successful intrigue, a Noble may invoke Flux as a Mod on the Elevation roll.

NOBLE SKILLS

	1 Personal	2 Academic	3 Space	4 General	5 Noble	6 Vocation	7 Avocation	
1	C1 +1	Major*	Zero-G	Animals	Leader	Noble	One Art	1
2	C2 +1	Major*	Vacc Suit	Fighting	Leader	Advocate	One Science	2
3	C3 +1	Minor*	Hi-G	JOT	Leader	Bureaucrat	One Trade	3
4	C4 +1	Minor*	Starship Skill	Language	Language	Diplomat	Pilot	4
5	C5 +1	One Trade	Gunner	Battle Dress	Strategy	Liaison	Fighting	5
6	Soc +1	One Trade	Sensors	Strategy	JOT	Counsellor	Gambler	6

*If the character does not have a Major/Minor this benefit is lost.

Marines

Which character type should you play? If you want to be part of an elite fighting force, then the Marines is the answer.

Marine. One who serves in a naval infantry unit. An elite fighter. A commando. A soldier serving aboard a starship.

MARINES	
To Begin	Str
Risk and Reward	Str C2 C3 Int
Soldier Promotion	C2
	Mod +1 per Rank
Commission	C3
Officer Promotion	Edu
	Mod +1 per Medal
Continue	Str
	Mod +1 per Term

SKILL ELIGIBILITY	
Per Term	4 skills
When Commissioned	1 skill
When Promoted	1 Skill
Automatic	By Rank

MUSTERING OUT BENEFITS		
1D	Money	Benefits
1	Low Psg	Forbidden Knowle
2	Mid Psg	Secret
3	Mid Psg	Wafer Jack
4	High Psg	C2 +1
5	StarPass	C3 +1
6	Cr 25,000	Life Insurance
7	Cr 30,000	Int +1
8	Retire x2	Knighthood
DM + Officer Rank		

CAREER CHANGE OPTIONS
Citizen, Scholar, Entertainer, Craftsman, Rogue, Noble, Functionary.
subject to eligibility

TABLE OF MARINE RANKS						
	Level	Rank	Auto Skill	Level	Rank	Auto Skill
1	Marine1	Private	Fighting	Officer1	2nd Lieutenant	
2	Marine2	Corporal		Officer2	1st Lieutenant	
3	Marine3	Sergeant	Hvy Wpns	Officer3	Captain	
4	Marine4	Staff Sergeant	Gunnery	Officer4*	Force Commander	Pilot
5	Marine5	Master Sergeant		Officer5	Lt Coronel	
6	Marine6	Sergeant Major		Officer6	Coronel	Leader
7				Officer7	General	
					*Auto: Command College	

THE MARINE CAREER

The focus of the Marines is keeping the peace and defending the Empire. Each term, he participates in marine operations.

At the beginning, roll 1D (DM+2 if Edu 10+) for Branch. Officers may not change Branch. Enlisted may reroll Branch when Promoted.

Every Year, roll 1D (DM+2 if Edu 10+) for the type of Military Operation.

If The Risk Roll Fails…

The Marine is wounded (hit points = Characteristic - Roll); recovery = 1D (unrecovered injury is permanent) and receives a Wound Badge. Permanent injury of 3+ **requires** disability discharge and awards 2X muster out benefits.

If The Reward Roll Succeeds…

The Marine receives a Campaign Ribbon (name the campaign involved) and may consult the Medals Table if Battle, Combat, Insurgency, or Mission.

BRANCH		
D	Branch	Mod
1	Infantry	1
2	Infantry	1
3	Artillery	0
4	Cavalry	1
5	Protected	2
6	Commando	3
7	Technical	0
8	Medical	0
DM+2 if Edu 10+		

MARINE OPERATIONS							
D	Inf Art Cav	Mod	Cdo Prot	Mod	Tech Med	Mod
1	Combat	2	Battle	3	Rear Area	0
2	Combat	2	Combat	2	Relief	1
3	Peace Keeper	1	Peace Keeper	1	Peace Keeper	1
4	Insurgency	1	Insurgency	1	Insurgency	1
5	Occupation	0	Insurgency	1	Mission	2
6	ANM School	-	ANM School	-	ANM School	-
7	ANM School	-	ANM School	-	ANM School	-
8	Garrison	0	Garrison	0	Garrison	0
DM +2 if Edu 10+						

The Mods shown (- for Risk; + for Reward) are required.

MARINE SKILLS — **Marines are Fighters:** A Marine may always choose Fighting skill instead of using this Table.

	1 Personal	2 Academic	3 Space	4 Surface	5 Fighting	6 Vocation	7 Avocation	
1	C1 +1	Major*	Zero-G	Driver	Comms	Marine	One Art	1
2	C2 +1	Major*	Vacc Suit	Flyer	Forward Obs	Fighting	One Science	2
3	C3 +1	Minor*	Hi-G	Battle Dress	Recon	Heavy Wpns	One Trade	3
4	C4 +1	Minor*	Starship Skill	Survival	Sapper	Heavy Wpns	Athlete	4
5	C5 +1	One Trade	Gunner	Navigation	Explosives	Battle Dress	Fighting	5
6	C6** +1	One Trade	Sensors	Comms	Stealth	Battle Dress	Gambler	6

*If the character does not have a Major/Minor this benefit is lost. **If the character has C6=Caste, this benefit is lost.

Functionaries

Which career should you play? Circumstances may thrust you into a Functionary position.

Functionary: One who holds an office or a trust or performs a particular function; an official. Administrator. Bureaucrat. Manager.

FUNCTIONARIES	
To Begin	Total Terms x3
Office Politics	Str C2 C3 Int

SKILL ELIGIBILITY
Per Term 4 Skills
Per Promotion 1 skill
From the Citizen Life Table

MUSTERING OUT BENEFITS		
1D	Money	Benefits
2	Cr 5,000	Forbidden Knowle
3	Cr 10,000	Secret
4	Cr 15,000	Wafer Jack
5	Cr 20,000	Str +1
6	StarPass	C2 +1
7	Cr 30,000	C3 +1
8	Cr 40,000	Int +1
9	Cr 50,000	Life Insurance
10	Cr 60,000	TAS Fellow
11	Pension x 2	Knighthood
12	Pension x2	Directorship
DM +Terms		
Automatic: A Gold Watch Value= Cr100 x Terms		

CAREER CHANGE OPTIONS
Scholar, Entertainer, Craftsman, Spacer, Soldier, Noble, Marine.
subject to eligibility

TABLE OF FUNCTIONARY RANKS			
	Level	Rank	Skills
0	Functionary0	Clerk	Bureaucrat-1
1	Functionary1	Supervisor	
2	Functionary2	Senior Supervisor	
3	Functionary3	Manager	
4	Functionary4	Senior Manager	
5	Functionary5	Assistant Director	
6	Functionary6	Director	

OFFICE POLITICS RISK AND REWARD

The focus of a Functionary is Office Politics. Success at Risk allows the Functionary to Continue; Success at Reward provides a Promotion.

Risk

If the Risk roll fails… the Functionary career ends. The character may not Continue.

If the Risk Roll succeeds… the Functionary may continue in the career. A Functionary MUST succeed on the Risk Roll to continue in the career.

Reward

If the Reward roll fails… the Functionary is not promoted.

If the Reward roll succeeds… the Functionary is promoted one rank.

If Risk fails and Reward succeeds, the character is promoted, but still may not continue.

FUNCTIONARY SKILLS

	1 Personal	2 Academic	3 Travel	4 Desk Job	5 Interaction	6 Vocation	7 Avocation	
1	C1 +1	Major*	Seafarer	Admin	Counsellor	Functionary	One Art	**1**
2	C2 +1	Major*	Vacc Suit	Advocate	Designer	Career***	One Science	**2**
3	C3 +1	Major*	Flyer	Broker	Forensics	Career***	One Trade	**3**
4	C4 +1	Minor*	Driver	Bureaucrat	Gambler	Career***	Athlete	**4**
5	C5 +1	Minor*	Navigation	Comms	Streetwise	Career***	Hobby****	**5**
6	C6** +1	Minor*	Survival	Computer	Teacher	Career***	Hobby****	**6**

*If the character does not have a Major/Minor this benefit is lost. **If the character has C6=Caste, this benefit is lost.
***If the character does not have a Career, this benefit is lost. ****If the character does not have a Hobby, this benefit is lost.

Educational Institutions

If a character attends an educational institution, the specific name of the institution should be recorded as well as the skills and degrees received. These tables provide a fast, concise system for naming educational institutions.

Educational Institutions

For each school attended, roll to determine the school name and record it on the Character Card. For those who care to compare the schools they attended, roll and record Rank for each school.

<City>	City name.
<Province>	Province name.
<Random>	Random number (4D)
<Brand Name>	Commercial name.
<Company>	Corporate name.
<Skill>	The skill or major being learned.
<World>	World name.
<Surname>	Name of a famous person.
<Color>	Name of a color.
<Government>	Typically = Imperial.
<Subgovernment>	Typically = Sector or Subsector.
<Type>	Naval or Military (for Academies)

ED5

Flux	School Name	Rank= inconsequential
- 5	<City> Municipal Education System	
- 4	<City> City Schools	
- 3	<City> Consolidated School District <Random>	
- 2	<City> Charter Schools	
- 1	<City> Independent School System <Random>	
0	<City> School System	
+1	<Province> Peoples Pedagogical Institute	
+2	<Province> Provincial Schools	
+3	<Province> Academy	
+4	<Province> Alternative Schools	
+5	<Province> Regional Education System	

Trade Schools

Flux	School Name	Rank= inconsequential
- 5	<Brand Name> Trade School	
- 4	<Company> School of <Skill>	
- 3	Institute of <Skill>	
- 2	<Brand Name> School of the <Skill> Arts	
- 1	<Company> Institute of <Skill>	
0	Standardized <Skill> Qualification Program	
+1	<Skill> Instruction Course	
+2	<Skill> Instruction Program	
+3	<Skill> Correspondence Course	
+4	<Skill> Career School	
+5	Certified <Skill> Course	

College

Flux	School Name	Rank = 2D
- 5	<City> College	
- 4	<Province> College	
- 3	College of <World>	
- 2	<City> City College	
- 1	<Province> Provincial College	
0	<World> College	
+1	All-<World> College of <Skill>	
+2	<Province> College of <Skill>	
+3	Peoples College of <Skill> (<World> Campus)	
+4	<Province> <Skill> College	
+5	<World> College (<Skill>)	

University

Flux	School Name	Rank= 3D
- 5	<World> University	
- 4	<Company> University	
- 3	<Surname> University	
- 2	<World> <Surname> University	
- 1	University of <World>	
0	Imperial University of <World>	
+1	All- <World> University	
+2	<Color> Faculty of the <World> Institute	
+3	<Surname> Institute	
+4	The <Color> Institute	
+5	<World> Orbital University	

Medical School

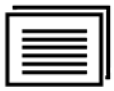
Flux	School Name	Rank = 2D
- 5	<World> University Medical School	
- 4	<Company> University Medical School	
- 3	<Surname> University Medical School	
- 2	<World> <Surname> University Medical School	
- 1	University of <World> Medical School	
0	University of <World> Medical School	
+1	All- <World> University Medical Specialty Course	
+2	<World> Institute Online Medical Systems	
+3	<Surname> Institute School of Medicine	
+4	The <Color> Institute School of the Medical Arts	
+5	<World> Orbital University College of Medicine	

Law School

Flux	School Name	Rank = 2D
- 5	<World> University Law School	
- 4	<Company> University Law School	
- 3	<Surname> University Law School	
- 2	<World> <Surname> University Law School	
- 1	University of <World> Law School	
0	University of <World> Law School	
+1	All- <World> University Legal Specialty Course	
+2	<World> Institute Online Legal Instruction	
+3	<Surname> Institute School of Law	
+4	The <Color> Institute School of the Legal Arts	
+5	<World> Orbital University College of Law	

Naval / Military Academy

Flux	School Name	Rank = 1D
- 5	<Government> <Type> Academy (<World>)	
- 4	<Subdivision> <Type> Academy (<World>)	
- 3	<World> <Type> Academy	
- 2	<Subdivision> Reserve <Type> Academy	
-- 1	<Government> Reserve <Type> Academy	
0	<World> NA	
+1	<Government> <Type> Training Institute at <World>	
+2	<Subdivision> <Type> Training Institute at <World>	
+3	People's <Type> Academy at <World>	
+4	All-System Faculty for <Type> Instruction, (<World>)	
+5	Online <Type> Instruction Directorate	



Changing Careers

A player may want to pursue more than one career in order to broaden his base of skills and abilities. Under some limited circumstances, a character may change to a new career.

Changing Careers

CHANGING CAREERS

A character may, within limits, change from the current career to a new career.

Only one career change may be attempted in a Term.

The chart indicates which career changes are possible. If the qualifications are met, the character may attempt to enlist or join the new career. If the enlistment is successful, the career change is automatic as of the beginning of the next term.

Failure in the enlistment attempt does not affect the current career; the character may continue in the current career.

A character may not change back to a previous career (except through Army Navy Marines Reserves).

	Intended New Career													
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	
Current Career	Citizen	Scholar	Entertainer	Craftsman	Scout	Merchant	Spacer	Soldier	Agent	Rogue	Noble	Marine	Functionary	Current Career
Citizen	Same	2	3	4	5	6	7	8	No	No	11	12	13	Citizen
Scholar	1	Same	3	4	5	No	7	8	No	10	11	12	13-a	Scholar
Entertainer	1	2	Same	4	No	No	7	8	No	No	11	12	13-b	Entertainer
Craftsman	1	2	3	Same	No	No	7	8	No	10	11	12	13	Craftsman
Scout	1	2	3	4	Same	No	7	8	No	10	11	12	13-d	Scout
Merchant	1	2	3	4	5	Same	7	8	No	10	11	12	13-e	Merchant
Spacer	1	2	3	4	No	No	Same	No	No	10	11	No	13-f	Naval
Soldier	1	2	3	4	No	No	No	Same	No	10	11	No	13-g	Soldier
Agent	1	2	3	4	No	No	7	8	Same	10	11	12	13-h	Agent
Rogue	1	2	3	4	No	No	7	8	9	Same	11	12	13	Rogue
Noble	No	No	No	No	No	No	No	No	No	No	Same	No	No	Noble
Marine	1	2	3	4	No	No	No	No	No	10	11	Same	13-k	Marine
Functionary	1	2	3	4	No	No	7	8	No	No	11	12	Same	Functionary

Requirements. Any requirement (skill, characteristic) is a minimum; a higher level also qualifies.

1. Citizen. Becoming a citizen is automatic if the character has no rank in the current career.

2. Scholar. Anyone (except a Noble) with Edu-10 and Major-8 may become a Scholar. Scout may substitute two Discoveries for Major-8. Entertainer or Craftsman may substitute Fame-12 for Major-8. If Major is a military or naval skill, the Scholar is associated with an Academy.

3. Entertainer. Anyone with any Fine Art-6 may become an Entertainer. Roll for Talent before deciding.

4. Craftsman. Anyone with Craftsman-1 and any two Skill-6 may become a Craftsman.

5. Scout. A Citizen, Scholar, or Merchant may become a Scout.

6. Merchant. A Citizen may become a Merchant.

7. Naval Reserves. If a character holds Naval reserve rank, he may change to that service (and go on active duty).

8. Army Reserves. If a character holds Army reserve rank, he may change to that service (and go on active duty).

9. Agent. A Rogue may decide to go straight and become an Agent.

10. Rogue. Many careers can decide to go Rogue (often prefixing Rogue to their former career).

11. Noble. Anyone with Soc-10 may change to Noble. Nobles may not change careers.

12. Marine Reserves. If a character holds Marine reserve rank, he may change to that service (and go on active duty).

13. Functionary. A character with Admin-6 may change to Functionary (associated with any career in which the character has previously served.

13-a. Scholar Functionary. A character with Admin-6 and Edu-10 can become a Scholar Functionary.

13-b. Entertainer Functionary. A character with Admin-6 and Fine Art-6 can become an Entertainer Functionary.

13-d. Scout Functionary. A Scout character disabled in his current career may change to Functionary.

13-e. Merchant Functionary. A Merchant character disabled in his current career may change to Functionary.

13-f. Naval Functionary. A Naval character disabled in his current career may change to Functionary.

13-g. Army Functionary. An Army character disabled in his current career may change to Functionary.

13-h. Agent Functionary. An Agent character disabled in his current career may change to Functionary.

13-k. Marine Functionary. A Marine character disabled in his current career may change to Functionary.

Aging

Characters naturally grow old and as they do they experience the effects of Aging.

Aging

THE AGING PROCESS

Aging affects the character's physical and mental characteristics, ultimately reducing them to zero and resulting in death.

Characters are immune to Aging for roughly the first half of their lives. Once Aging begins, it occurs every term on the character's birthday and may result in a reduction in individual characteristics.

NORMAL AGING

Physical aging affects all of the Physical Characteristics. Mental Aging affects some of the Mental Characteristics.

Human Physical Aging affects Strength, Dexterity, and Endurance. It begins at age 34 (the beginning of Life Stage 5- Peak) and is resolved as an Aging Check.

Human Mental Aging affects Intelligence. It begins at age 66 (the beginning of Life Stage 9- Retirement) and is resolved as an Aging Check.

Sophont Physical Aging affects the Physical Characteristics C1 Strength, C2 Dexterity Agility Grace, and C3 Endurance Stamina Vigor. It begins at the beginning of Life Stage 5- Peak) and is resolved as an Aging Check.

Sophont Mental Aging affects Intelligence and Instinct (if present). It begins at the start of Life Stage 9- Retirement and is resolved as an Aging Check.

THE AGING CHECK

The Aging Check determines if a characteristic is reduced by aging.

Every Four Years. The Aging Check is resolved every four years on the character's birthday. The Crisis is rolled for each applicable Characteristic.

To Feel Age Effects (The Aging Check)
2D < Life Stage
Success inflicts the effects of age on the character.
(A character wants to FAIL this action).

If the Aging Check imposes an effect, the characteristic is reduced -1.

If one Characteristic is reduced to 0, it is reset to 1.

If two Characteristics are reduced to 0, the character suffers a major illness and must spend four weeks in rest and recuperation. The two characteristics are each reset to 1.

If three Characteristics are reduced to 0, the character suffers an extremely major illness and must spend four months in rest and recuperation. The three characteristics are each reset to 1. The second time three characteristics are reduced to 0, the character dies.

LIFE STAGES

Every character passes through a series of Life Stages from infancy to old age. Each Life Stage (after Infancy) is two terms (8 years) in length. (This may differ for non-humans).

These stages include:

0. Infant. A helpless infant under the care of an adult member of the family. All races have an approximately 2-year-long infancy.

1. Child. An immature member of a family receiving basic education.

2. Teen. A gender mature individual not yet fully responsible in society. The first two years of this Life Stage are the period of Gender maturity. Cadet characters are generated and begin play at the beginning of year 3 of Teen. (=12 for Humans).

3. Young Adult. A physically mature individual with full responsibilities in society. Traditional character generation begins at the start of Young Adult (=18 for Humans).

4. Adult. A full member of society.

5. Peak. An individual at the height of physical and mental abilities. Physical aging begins at the start of Peak.

6. Mid-Life. An individual approximately half way through a typical life span.

7. Senior. An experienced individual.

8. Elder. An individual at the greatest levels of personal achievement.

9. Retirement. An individual is living on the fruits of his prior labors. Mental aging begins at the start of Retirement (= 66 for Humans).

THE STAGES OF LIFE

No	Life Stage	Human Years	Terms
0	Infancy	0- 1	1/2
1	Childhood	2- 9	2
2	Adolescence	10-17	2
3	Young Adult	18-25	2
4	Adult	26-33	2
5	Peak	34-41	2
6	Mid-Life	42-49	2
7	Senior	50-57	2
8	Elder	58-65	2
9	Retirement	66-71	2

Traditional Lifespan is the sum of the lengths of the Life Stages. For example, Humans have a 2-year infancy and nine stages of 8 years each. The traditional lifespan for humans is 74 years (although certainly some may live longer, and some may live shorter lives).

CLONE AGING

Forced Growth Cloning (Relicts, Guests, and Meds) accelerates the aging pattern of the individual: Physical Aging begins at Life Stage 4 (one stage earlier than the original sophont); mental aging begins at Life Stage 8 (also one stage earlier than the original sophont).

Natural and Offspring clones are not subject to accelerated clone aging, and they age normally.

Fame and Recognition

Fame is an indication of the reputation or renown of a character. Fame is more than simple rank or position; it is the character's widespread presence in the minds of others.

FAME

Fame is the degree of recognition or respect which society in general (or specific subdivisions of society such as the military) holds for an individual. Fame is not a guarantee of instant recognition; it is the likelihood that a search of documents or databanks will return information about the individual (and fame may reflect infamy or notoriety).

Expressing Fame. Fame is stated in levels noted as Fame-<level>. A world famous entertainer has Fame-9. A Fame-9 entertainer probably has name recognition anywhere on the world on which he performs.

CALCULATING FAME

The current level of Fame for an individual is based on a variety of accomplishments

Armed Forces

Army	Officer Rank	
Marine	Officer Rank	
Navy	Officer Rank	

Enlisted Rank has no value.

Military Decorations

Wound Badge	x 1
MCUF	x 1
MCG	x 3
SEH	x 8
SEH	x10

Nobles

Base Fame from Chargen

Other Sources

Scholar	Rank	
Scholar	Publications	x 1
Scholar	Award Winning Pubs	x 3
Craftsman	Masterpieces	x 3
Scout	Discoveries	x 4
Merchant	Rank	
Merchant	Ship Owner	= 1D
Agent	Commendations	points
Rogue	Successful Schemes	x 2
Rogue	Failed Schemes	x 3

If NO other eligibility, 1D

xN = N Fame points per occurrence. For example, Rogue receives 3 point per Failed Scheme.

The Fame Flux Event. Any character may choose (once during Character Generation or after adventuring begins) to add Flux to Fame.

FAME	
F	Description
0	Unknown
1	Mother
2	Close Family
3	Family
4	Neighborhood
5	Town
6	City
7	Urban
8	Regional
9	Continental
10	World
11	World Complex
12	World System
13	Inner System
14	Outer System
15	Remote System
16	Neighbor Systems
17	Several Systems
18	Many Systems
19	Subsector
20	Sector
21	Sectors
22	Domain
23	Domains
24	Empire
25	Beyond Empire
26	Several Empires
27	This Spiral Arm
28	Many Spiral Arms
29	The Galaxy
30	Several Galaxies
31	Many Galaxies

Entertainer Fame is calculated using the Entertainer Fame process.

MEDALS

Receipt of a Medal is determined by the Risk and Reward Rolls for Army, Navy, or Marines.

If the Reward Roll Succeeds, subtract the Reward Roll from the Controlling Characteristic (ignore any Mods) and consult the Medals Table.

MEDALS TABLE	
C-R	Medal
1 2 3	**MCUF** **Meritorious Conduct Under Fire.** Operations against an enemy.
4 5 6	**MCG** **Medal for Conspicuous Gallantry.** Bravery against an enemy.
7 8 9	**SEH** **Starburst for Extreme Heroism.** Extraordinary courage against an enemy
10 11 12+	***SEH*** **SEH With Diamonds.** Superhuman courage.

*C-R =the Controlling Characteristic (without Mods) minus the Reward Die Roll (for Navy, Army, or Marines).

COMMENDATIONS

Receipt of a Commendation is determined by the Risk and Reward Rolls for Agents.

If the Reward Roll Succeeds, the subtract Reward Roll from the Controlling Characteristic (ignore any Mods) and record the Commendation in the format shown on the Commendation Table.

COMMENDATIONS		
<Service>	Commendation-	N

*C-R =the Controlling Characteristic (without Mods) minus the Reward Die Roll (for Agents).

Wound Badges. If the Army, Navy, or Marines Risk Roll fails, the character is wounded and receives a Wound Badge (WB). A number after the WB indicates the number of times it has been received.

CHARACTER FAME EXAMPLES

Scholar Professor of Physics (Rank5). Three Publications (one is Award Winning). Fame = 5 + 3 +3 = 11 =World Complex.

National Treasure Craftsman. Six perfect Masterpieces. Fame = 6 * 3 = 18 = Many Systems.

Scout. Two Discoveries. Fame = 2 x 4 = 8 - Regional.

Land Grants

Nobles receive Land Grants on the worlds on which they hold fiefs. Each Hex generates a standard profit equal to Cr10,000 per Trade Classification per year (a Hex with no TC generates Cr5,000 annually).

Land Grants

AWARDING OF LAND GRANTS

Land Grants are awarded to Explorer-Discoverers and to Nobles.

Noble Land Grants. The Imperium creates a Fief and an associated Land Grant whenever a Noble is created. There is a distinct Land Grant for each Noble rank.

Discoverer Land Grants. The Imperium makes a Land Grant to the discoverer of a new world (or of a new major feature on an existing world). The Imperium pays the Discoverer standard fees in lieu of actual possession. The holder of a Discovery Land Grant can travel to the world and take possession of the actual land and develop it.

IMPERIAL FIEFS

Nobles of the Imperium receive, as part of their grant of title and rank, Noble Lands: Land Grants expressed as hexes on world geodesic maps.

The first hex in any grant is on the noble's homeworld. All subsequent hexes are randomly allocated. For each hex on a mainworld, a noble is also allowed one hex on a non-mainworld in the same system.

The Imperium prefers grants to worlds with high potential for development: those with Atmos 2-9, Hydrographics 4-8 (which means that with proper development the world can become Ind, Ri, or Ag).

NOBLE LAND GRANTS

Noble Rank	Soc	Hexes	Non-MW	Where?	Preferred World
Gentleman	A	--	1	any	any
Knight	B	1	1	homeworld.	any
Baronet	c	2	2	same system	Pre-Ag or Pre-Ri
Baron	C	4	4	same system.	Ag or Ri
Marquis	D	8	8	same subsector	Pre-Ind
Viscount	e	16	16	same subsector	Pre-Hi
Count	E	32	32	same sector	Hi
Duke	f	64	64	same sector	Ind
Duke	F	128	128	same sector	any
Archduke	G	256	256	same domain	any

Each Hex generates a profit equal to Cr10,000 per Trade Classification per year. A Hex with no TC generates Cr5,000 annually.

Noble Land Grants are cumulative. Each title confers its own Land Grant.

Discoverer Land Grants. The Imperium makes a Land Grant to the discoverer of a new world (or of a new major feature on an existing world). The Imperium pays the Discoverer standard fees in lieu of actual possession.

Within the Imperium, the Land Grant operates much like a Noble grant. Outside the Imperium, the Land Grant can be actualized only if and when the world is admitted to the Imperium, or when it attains client-state status.

The holder of a Discovery Land Grant can travel to the world and (attempt to) take possession of the actual land and develop it.

Many such grants have been made, and have lain in safe deposit boxes for generations, waiting for the time when the world enters the Imperium.

THE IMPERIAL CALENDAR

Holiday	Wonday	Tuday	Thirday	Forday	Fiday	Sixday	Senday
1 Holiday	2	3	4	5	6	7	8
	16	17	18	19	20	21	22
	30	31	32	33	34	35	36
	44	45	46	47	48	49	50
	58	59	60	61	62	63	64
	72	73	74	75	76	77	78
	86	87	88	89	90 Armed Forces Day	91	92
	100	101	102	103	104	105	106
	114	115	116	117	118	119	120
	128	129	130	131	132	133	134
	142	143	144	145	146	147	148
	156	157	158	159	160	161	162
	170	171	172	173	174	175	176
	184	185	186	187	188	189	190
	198	199	200	201	202	203	204
	212	213	214	215	216	217	218
	226	227	228	229	230	231	232
	240	241	242	243	244	245	246
	254	255	256	257	258	259	260
	268	269	270	271 Day of Thanks	272	273	274
	282	283	284	285	286	287	288
	296	297	298	299	300	301	302
	310	311	312	313	314	315	316
	324	325	326	327	328 Graduation	329	330
	338	339	340	341	342	343	344
	352	353	354	355	356	357	358

Wonday	Tuday	Thirday	Forday	Fiday	Sixday	Senday
9 School Year Starts	10	11	12	13	14	15
23	24	25	26	27	28	29
37	38	39	40	41	42	43
51	52	53	54	55	56	57
65	66	67	68	69	70	71
79	80	81	82	83	84	85
93	94	95	96	97	98	99
107	108	109	110	111	112	113
121	122	123	124	125	126	127
135	136	137	138	139	140	141
149	150	151	152	153	154	155
163	164	165	166	167	168	169
177	178	179	180 Mid Year Break	181	182	183
191	192	193	194	195	196	197
205	206	207	208	209	210	211
219	220	221	222	223	224	225
233	234	235	236	237	238	239
247	248	249	250	251	252	253
261	262	263	264	265	266	267
275	276	277	278	279	280	281
289	290	291	292	293	294	295
303	304	305	306	307	308	309
317	318	319	320	321	322	323
331	332	333	334	335	336	337
345	346	347	348	349	350	351
359 Year End Break	360	361	362	363	364	365 New Year's Eve

The **Imperial Calendar** numbers the days of each year from 1 to 365 (matching both the Sylean and the Terran standard). Imperial holidays and important dates are marked; additional holidays may be added by local authorities.

Character Birthdate

Every character has a birthdate, which is used to track chronological age, to help produce an understanding of the passage of time, and as a trigger to acquiring experience.

Birthdays

Every Character has a birthdate: the historical date on which he or she or it was born.

Noted on the Imperial Calendar.
Defines Age.
Governs Experience.
Computes Chronological Age.

THE CURRENT DATE

The current date for a campaign is established by the Referee.

Suggested dates for campaigns within the Imperium are:

The Golden Age	001-1105
The Psionic Suppressions	001- 870
The Civil War	001- 550
First Survey	001- 200
Dawn of the Imperium	001- 001
The New Era	001-1248

Time for a campaign is recorded on the Imperial Calendar.

COMPUTING BIRTHDATES

Each character computes his or her birthdate by subtracting Age from the current year.

The birthday of the year is determined randomly from the Birthday Chart.

Alternative Birthdate Determination. Use the Player's Birth Date to determine the day of the year for the Character's Birthdate.

BIRTH DATE

	1D= 1-2-3						1D= 4-5-6					
D D	1	2	3	4	5	6	1	2	3	4	5	6
1 1	1	37	73	109	145	RR	181	217	253	289	325	361
1 2	2	38	74	110	146	RR	182	218	254	290	326	361
1 3	3	39	75	111	147	RR	183	219	255	291	327	363
1 4	4	40	76	112	148	RR	184	220	256	292	328	364
1 5	5	41	77	113	149	RR	185	221	257	293	329	365
1 6	6	42	78	114	150	RR	186	222	258	294	330	RR
2 1	7	43	79	115	151	RR	187	223	259	295	331	RR
2 2	8	44	80	116	152	RR	188	224	260	296	332	RR
2 3	9	45	81	117	153	RR	189	225	261	297	333	RR
2 4	10	46	82	118	154	RR	190	226	262	298	334	RR
2 5	11	47	83	119	155	RR	191	227	263	299	335	RR
2 6	12	48	84	120	156	RR	192	228	264	300	336	RR
3 1	13	49	85	121	157	RR	193	229	265	301	337	RR
3 2	14	50	86	122	158	RR	194	230	266	302	338	RR
3 3	15	51	87	123	159	RR	195	231	267	303	339	RR
3 4	16	52	88	124	160	RR	196	232	268	304	340	RR
3 5	17	53	89	125	161	RR	197	233	269	305	341	RR
3 6	18	54	90	126	162	RR	198	234	270	306	342	RR
4 1	19	55	91	127	163	RR	199	235	271	307	343	RR
4 2	20	56	92	128	164	RR	200	236	272	308	344	RR
4 3	21	57	93	129	165	RR	201	237	273	309	345	RR
4 4	22	58	94	130	166	RR	202	238	274	310	346	RR
4 5	23	59	95	131	167	RR	203	239	275	311	347	RR
4 6	24	60	96	132	168	RR	204	240	276	312	348	RR
5 1	25	61	97	133	169	RR	205	241	277	313	349	RR
5 2	26	62	98	134	170	RR	206	242	278	314	350	RR
5 3	27	63	99	135	171	RR	207	243	279	315	351	RR
5 4	28	64	100	136	172	RR	208	244	280	316	352	RR
5 5	29	65	101	137	173	RR	209	245	281	317	353	RR
5 6	30	66	102	138	174	RR	210	246	282	318	354	RR
6 1	31	67	103	139	175	RR	211	247	283	319	355	RR
6 2	32	68	104	140	176	RR	212	248	284	320	356	RR
6 3	33	69	105	141	177	RR	213	249	285	321	357	RR
6 4	34	70	106	142	178	RR	214	250	286	322	358	RR
6 5	35	71	107	143	179	RR	215	251	287	323	359	RR
6 6	36	72	108	144	180	RR	216	252	288	324	360	RR

Roll to determine the specific date of the year.

Life Events

Add depth to any character by creating the name of the military unit with which he served, the name of the important battles he participated in, or important events.

App 2a Life Events

Players should enhance the histories of their characters by creating the names of their service units and any battle or campaigns in which they served. Nobles should create the name of any intrigues in which they are involved.

<City>	City name.
<Gas Giant>	Gas Giant Name.
<Letters>	Any two or three alphabetics.
<Number 1-digit>	1-digit Number.
<Number 2-digit>	2-digit Number.
<Number 3-digit>	3-digit Number.
<Number 4-digit>	4-digit Number.
<Province>	Province name.
<Satellite>	Satellite Name.
<Star>	Star Name.
<Surname>	Personal Surname.
<World>	World Name.
<Element>	Chemical Element Name

ROLL TWICE

When using a twice: once on each column, to create the appropriate descriptor.

Army / Navy / Marines. Create a military unit name (appropriate for his branch assignment) for an Army or Marine character. A reservist should create a separate Reserve unit.

Create a naval unit name for a Navy character. A reservist should create a separate Reserve unit.

Create one Battle name for each Service Ribbon.

Nobles. Create a name for each Intrigue for a Noble.

Army or Marine Units

Flux	Designation	Type
-5	Joint	Lift Infantry Regiment
-4	<Province>	Grav Tank Regiment
-3	<City>	Ortillery Regiment
-2	<Number 1-digit>	Artillery Regiment
-1	<Number 3-digit>	Lift Cavalry Squadron
0	<Number 4-digit>	Armored Infantry Regiment
+1	<World>	PKF [Peace Keeping Force]
+2	<Number 2-digit>	Admin Battalion
+3	<City>	Support Battalion
+4	<Province>	Transportation Battalion
+5	Special	Rifle Battalion

Navy Units

Flux	Designation	Type
-5	<Number 1-digit> Joint	Battle Squadron
-4	<Star>	Fleet Headquarters
-3	<World>	Cruiser Squadron
-2	<Number 1-digit>	Escort Squadron
-1	<Number 3-digit>	System Defense Wing
0	<Number 4-digit>	Ortillery Squadron
+1	<Number 2-digit> Reserve	Fighter Wing
+2	<Number 2-digit>	Attack Squadron
+3	<City>	Defense Squadron
+4	<Province>	Support Squadron
+5	Special	Long Range Squadron

Army or Marine Service Battles

Flux	Name	Location
-5	The Campaign (on/in)	<World>
-4	The Bloody Campaign (on/in)	<City>
-3	The Retreat from	<Province>
-2	The Assault (on/in)	<World>
-1	The Defense of	<Star>
0	The Trench War at	<Province>
+1	The Undeclared War at	<World>
+2	The Guerrilla Operations (on/in)	<City>
+3	The Mistake at	<Gas Giant>
+4	The Final Victory at	<World>
+5	The Battle of	<City>

Navy Service Battles

Flux	Name	Location
-5	The Scrubbing of <World>	<World>
-4	The Bombardments at	<Star>
-3	The Ortillery Campaign at	<Satellite>
-2	The Skirmishes at	<Gas Giant>
-1	The Pursuits at	<Star>
0	The Battle of	<Satellite>
+1	The Relief of	<World>
+2	The Quarantine of	<Star>
+3	The Siege of	<Satellite>
+4	The Disaster at	<World>
+5	The Sieges of	<Gas Giant>

Merchant Companies

Flux	Designation	Type
-5	< > Express	<Surname>
-4	< > Factors	<World>
-3	<World>-<World> Lines	<Satellite>
-2	< > Agency	<Star>
-1	< > Lines	<Letters>
0	< > Shipping	<Surname>
+1	< > Transporters	<World>
+2	< > Lines	<Satellite>
+3	<Surname> and Sibs	<Star>
+4	< > Trading	<Letters>
+5	< > Orbital Express	<Surname>

Noble Intrigues

Flux	Event	Descriptor
-5	The < > Affair	<Element>
-4	The < > Scandal	<World>
-3	The < > Ring	<Satellite>
-2	The Judgment Against <Surname>	<Star>
-1	The Exile to <World>	<Letters>
0	The < > Commission	<Surname>
+1	<Surname>'s Palace	<World>
+2	<Surname>'s Return	<Satellite>
+3	<Surname>'s Misconduct	<Star>
+4	<Surname>'s Secret Exile	<Letters>
+5	The Assassination of <Surname>	<Surname>

More Life Events

Add depth to any character by creating the name of the military unit with which he served, the name of the important battles he participated in, or important events.

App 2b Life Events

<City>	City name.
<Gas Giant>	Gas Giant Name.
<Letters>	Any two or three alphabetics.
<MegaCorp>	Megacorporation Name.
<Number 1-digit>	1-digit Number.
<Number 2-digit>	2-digit Number.
<Number 3-digit>	3-digit Number.
<Number 4-digit>	4-digit Number.
<Province>	Province name.
<Satellite>	Satellite Name.
<Star>	Star Name.
<Surname>	Personal Surname.
<World>	World Name.

Players can (and should) enhance the histories of their characters by creating the specific details of their lives. A well-crafted short statement about a character helps create focus and understand motivations.

Interrupting A Citizen's Life

Flux	Interruption
- 5	**War.** The homeworld has been devastated by military operations.
- 4	**Natural Disaster.** The homeworld is suffering extensive natural disaster.
- 3	**Environmental Change.** The homeworld is experiencing extensive ecological change.
- 2	**Personal Disaster.** The Citizen has suffered a terrible personal loss.
- 1	**Personal Discontent.** The Citizen is discontent with his personal situation.
0	**Personal Mission.** The Citizen has a significant personal unfilled need.
+1	**Flight.** The Citizen has witnessed events which prove dangerous to him.
+2	**Exploration.** The Citizen has decided to abandon his current life
+3	**Economic Disaster.** The homeworld is suffering from economic upheaval.
+4	**Social Disgrace.** The Citizen has suffered a significant social embarrassment.
+5	**Retirement.** The Citizen has fulfilled his personal responsibilities to society on his homeworld.

Research Topic

Flux	Topic
-5	A Preliminary Survey of the Literature of <Major>.
- 4	Aspects of the Elementary Philosophy of <Major>.
- 3	A Detailed Bibliography of <Major>.
- 2	The Impact of Data from <WorldName> on <Major>.
- 1	Toward an Alternate Basic Theory of <Major.>
0	The Effects of <Minor> on <Major>.
+1	Refuting <Professor Name>'s Theory of <Major>.
+2	Practical <Major> on <WorldName>.
+3	<Major> and its Impact on the Universe Today.
+4	Our Evolving Understanding of <Major>.
+5	Disasters in the Application of <Major>.

Agent Mission

Flux	Mission
-5	To stop piracy.
- 4	To stop counterfeiting.
- 3	To root out bank fraud
- 2	To stop illegal cloning.
- 1	To suppress psionics.
0	To uncover corrupt officials and nobles.
+1	To expose incompetence in the Navy.
+2	To uncover fraud in the Scout Service.
+3	To discover spies in the Bureaucracy.
+4	To discover project secrets at <MegaCorp>.
+5	To destroy the databanks at <World>.

Rogue Scheme

Flux	Scheme
-5	Promoting a foolproof project to terraform <World>.
- 4	Acquiring control of the major industry on <World>.
- 3	Hijacking the <World> Express.
- 2	Faking a Land Grant to the <World> Copper Mines.
- 1	Selling fake antique portraits of Nobles.
0	Selling a powerful but flawed starship armor formula.
+1	Selling a plan to filter atmosphere taint from <World>.
+2	Selling weapons in the conflict on <World>.
+3	Selling battle-dead clones as labor sophontoids.
+4	Selling war surplus parts repackaged as new.S
+5	Enticing investors with a promise of nobility.

Rogue Masquerade

Flux	Masquerade
-5	Citizen with family ties to the nobility.
- 4	Scholar with secret research in Artificial Intelligence.
- 3	Entertainer who knows all the bog stars.
- 2	Craftman with access to thousands of masterpieces.
- 1	Scout with the coordinates of the Golden Worlds.
0	Spacer veteran of the <Star> anti-pirate campaign.
+1	Soldier veteran war hero with an SEH.
+2	Agent tracking down a Rogue on <World>.
+3	Noble exiled unfairly.
+4	Star Marine officer once bodyguard to the Emperor.
+5	Functionary on vacation.

Secrets A

A Secret is some object or thing the character finds in his possession upon Mustering Out: it may be something in his files, or taken from the bottom of a drawer, or a memento. The significance of the object is controlled by the referee in the course of later events.

App 3a Secrets

Players can enhance the histories of their characters by creating the names of their service units and any battle or campaigns in which they served. Nobles can create the name of any intrigues in which they are involved.

<World>	World name.
<Province>	Province name.
<Satellite>	Satellite Name.
<Star>	Star Name.
<Surname>	Personal Surname.
<Element>	Chemical Element Name
<Company>	Company Name.
<Writer>	A talented Author.
<Entertainer>	A talented Entertainer.
<Material>	A construction or crafting material.
<Language>	A language.

Scholar

Flux	Description
-5	A reference to an unobtainable scholarly paper.
-4	A sample from a long-ago field expedition.
-3	A report on the biology of life on <World>.
-2	Chemical samples from <World>.
-1	The secret handwritten memoirs of Cleon I.
0	A detailed Anglic-<Language> vocabulary.
+1	The <World> Book of Wisdom.
+2	Detailed readings predicting flare timing for <Star>.
+3	A planetquake predictor.
+4	The secret location of the <World> Psionic Institute.
+5	Computer access codes for University of <World>.

Scout

Flux	Description
-5	Co-ordinates for a world beyond the frontier.
-4	The location of a First Empire advanced depot.
-3	A high quality communicator.
-2	Orbit details for a comet in the <Star> system.
-1	The suppressed report on the Disaster at <World>.
0	Location of a wrecked battleship.
+1	Location of a permanent storm on <World>.
+2	A technique that increases Power Plant output 20%.
+3	The only copy of a report on faulty Scout ship drives.
+4	Scout Service bulletin interdicting <Star> System.
+5	A simple device that disables Maneuver drives.

Entertainer

Flux	Description
-5	A previously unknown script by a famous playwright.
-4	A book banned by the Imperial bureaucracy.
-3	The fabled never-released epic video by <Writer>.
-2	Handwritten Ultimate Melody (some wrong notes?).
-1	The location of <Entertainer's> secret mansion.
0	Samples of a paint of intense color.
+1	Smell Artist <Name>'s private recipe book.
+2	Studio notes for the Image Artist <Name>.
+3	Samples of sound responsive paint.
+4	A subliminal influence projector.
+5	A detailed operations plan for a Touring Company.

Merchant

Flux	Description
-5	A blank certificate for <skill>
-4	Encryption key creation formulas for <Merchant>.
-3	A face image of a pirate from <Subsector>.
-2	A bearer bank account number on <World>
-1	A cargo shipment storage claim number.
0	A ship share certificate marked "Special".
+1	A clicker that seems to open every ship it visits.
+2	An image of <World> starport before its renovation.
+3	A wafer marked <Date> <World>
+4	Detailed plans for the <World> Starport.
+5	Confidential ship schedules for <Company>.

Craftsman

Flux	Description
-5	A key and a map.
-4	<Sourceworld> for an anti-corrosive finish.
-3	A list of Masterpieces in an Imperial warehouse.
-2	An Imperial Credit printed on ordinary paper.
-1	A finely crafted Target Rifle.
0	Packet of seeds marked "Fountain of Youth" Plant.
+1	An AAB Archive Access code.
+2	A detailed 4NA scan of a sophont species.
+3	The location of a grove of <material> trees.
+4	A wafer with knowledge to construct a Jump-6 drive.
+5	A sample of a super glue.

Spacer

Flux	Description
-5	A gun imager from a Zhodani fighter.
-4	A prototype hull breach patch.
-3	Precise performance specifications on Jump Drives.
-2	Secret bulletin on naval patrols in <Subsector>.
-1	A component stock number not in the central catalog.
0	Co-ordinates of a rogue world in deep space.
+1	Images of atrocities committed on <World>
+2	An Aslan warrior's personal dagger.
+3	A Vargr officer's uniform cap.
+4	A captured corsair banner.
+5	The navigation module from a Zhodani frigate.

Secrets 2

A Secret is some object or thing the character finds in his possession upon Mustering Out: it may be something in his files, or taken from the bottom of a drawer, or a memento. The significance of the object is controlled by the referee in the course of later events.

App 3b Secrets

Players should enhance the histories of their characters by creating the names of their service units and any battle or campaigns in which they served. Nobles should create the name of any intrigues in which they are involved.

<world>	World name.
<Gas Giant>	Gas Giant Name.
<Letters>	Any two or three alphabetics.
<Number 1-digit>	1-digit Number.
<Number 2-digit>	2-digit Number.
<Number 3-digit>	3-digit Number.
<Number 4-digit>	4-digit Number.
<Province>	Province name.
<Satellite>	Satellite Name.
<Star>	Star Name.
<Surname>	Personal Surname.
<World>	World Name.
<Element>	Chemical Element Name

Soldier

Flux	Description
-5	After Action Report for the <Battle>.
-4	Contingency plan for an invasion of <World>
-3	Strange Zhodani automatic pistol.
-2	An anti-matter artifact (in a magnetic capsule).
-1	Co-ordinates on an unexplored world.
0	The location of a fabled lost temple on <World>.
+1	A seawater-stained shirt flecked with gold.
+2	The co-ordinates of a ruined Tech-Z world.
+3	A strange surly self-aware computer.
+4	A chip with a programmable virus.
+5	A combat drug that restores Sanity.

Agent

Flux	Description
-5	A deck plan map of the Duke's yacht.
-4	Lock schematic for the vault at the Bank of <World>.
-3	The co-ordinates of a "graveyard of lost ships."
-2	A complete set of false identity papers.
-1	A J-Drive-crippling 4D virus.
0	A memo filled with account numbers.
+1	The script for a potential hit play.
+2	Blueprints for an experimental navigation system.
+3	The password to an account at the Bank of <World>,
+4	StdDGR-16 Standard Disposable Gauss Rifle -16
+5	A shipyard priority building code.

Rogue

Flux	Description
-5	A Human DNA sample and personality scan.
-4	A subliminal effect image.
-3	Images of a secret Imperial starship.
-2	A marketing plan for a recreational fad.
-1	A 10,000 share certificate for a corporation.
0	A small rock with strange engraved markings.
+1	An antique bracelet dating from the Long Night.
+2	Fourteen copies of a real estate report on <World>.
+3	The master password to a data backup facility.
+4	The location of a secret Nuclear Weapons depot.
+5	Time and place co-ordinates several years from now.

Noble

Flux	Description
-5	A dossier on the Baron of <World>.
-4	A false patent of nobility for the Baron of <World>.
-3	A high priority code for Army procurement.
-2	Plans for a starport upgrade at <World>.
-1	A formula for a potent chemical weapon.
0	An heirloom set of goblets from the First Imperium.
+1	A crudely drawn map labeled <World>.
+2	A detailed family tree for the Marquis of <World>.
+3	A 4D virus.
+4	A bio-sample marked <World> Anagathic?
+5	Sophont skull with tags marked <World> 430k years?

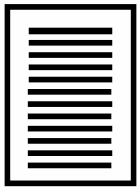
Elite

Flux	Description
-5	A Marine dress dagger with a secret compartment.
-4	A "Secret"-stamped Fusion-Gun Specification Manual.
-3	A battle language dictionary.
-2	Evidence of battlefield atrocities.
-1	A controller for a Cutter.
0	Personnel directory of Star Marine Detachment 501.
+1	A wafer with Fighting-12.
+2	The location of an abandoned Rule of Man depot.
+3	AMAcP-13 Advanced Magnum Accelerator Pistol -13
+4	An unusual bio-scanner.
+5	A Zhodani combat banner.

Citizen / Functionary

Flux	Description
-5	An approved real estate transaction form.
-4	The location of the Psionics Institute of <World>.
-3	A set of old 3D entertainment posters.
-2	A dress worn by the Empress.
-1	A data wafer with an encryption code scribbled on it.
0	Ownership documents for a company on <World>
+1	A set of rare early empire coins.
+2	An unidentified genetic profile.
+3	A claim tag for a locker at <World> Starport.
+4	A small stasis capsule.
+5	Misfiled ownership papers for property on <World>

Life Pursuits And Experience



Characters can designate specific areas of interest in their lives and improve them over time.

A **Life Pursuit** is a skill emphasis by a character: a statement that a specific skill has priority for that character. It may be the character's job, his hobby, or some other area of importance. A **Certificate** is a formal statement that a character can succeed at specific tasks. Together, these two concepts allow a character to improve his store of skills through Experience.

LIFE PURSUITS

Life Pursuits provide specific advantages in use of the related skills, and in acquiring experience.

Life Pursuit Defined

A Life Pursuit is a brief statement about a specific job or hobby or interest. It is defined with a Title, a Primary Skill, a Required Characteristic, a C+S, and (optional) Secondary Skills.

Life Pursuit
Descriptive Title
Characteristic. Skill. C+S=12.
Commentary.

Title. The Title of the Life Pursuit is stated as a job title or occupation. A few words of description may be included.

Primary Skill. The Primary Skill is the most appropriate skill, knowledge, or talent for the Life Pursuit.

Required Characteristic. A Required Characteristic is the characteristic most applicable to the use of the Primary Skill.

Secondary Skills. One or more Secondary Skills may be stated (but are not required).

For example,

Life Pursuit
Neurosurgeon Doctor in interstellar service.
Medical. Dexterity. C+S=12.

Life Pursuit
Competitive Weight Lifter.
Athlete. Strength. C+S=12.

A character with Medical and Dexterity can have this Life Pursuit if the sum of Medical and Dexterity is at least 12.

Required C+S

The required C+S for a character's first Life Pursuit is 12; enough to succeed at an Average task 100% of the time. The required C+S increases +1 in each additional Life Pursuit. A character's tenth Life Pursuit requires C+S= 21.

Only the Primary Skill value is used in C+S. Other skills can be stated but are not included in the calculation.

How Many Life Pursuits? A Life Pursuit expresses an important interest or ability for a character. While it is possible to have dozens of Life Pursuits, they do not then express important interests. Most characters should have 3 or 4 Life Pursuits.

For Reference. A player may ask about a particular Life Pursuit ("What's involved in being a Concert Pianist?"). The Game Master records a Life Pursuit and marks it "For Reference." Players can then decide if they want to use that Life Pursuit.

Life Pursuit (For Reference)
Concert Pianist
Dexterity. Music. C+S=12.
Primary Instrument = Piano.

A Hobby. An otherwise unqualified character may make one Life Pursuit his hobby even if he does not have the required C+S. It is labeled Hobby.

Life Pursuit (Hobby)
Concert Pianist
Dexterity. Music. C+S=12.
Primary Instrument = Piano.

Shifting Priorities

A Character can shuffle the priorities of his Life Pursuits from time to time.

The Value Of A Life Pursuit

Life Pursuits show the areas that a character cares about in his life. When a Life Pursuit skill is used, the character is allowed Mod +1.

The Experience Rules can only increase a skill, talent, or knowledge which has been designated a Life Pursuit.

CERTIFICATES

A **Certificate** is a formal statement that a character can succeed at specific tasks. Expressed in the format Certificate of <Skill>, it shows that the character has successfully passed an examination (in game time, under the direction of the Referee) in the Skill.

Certificates are the basis for employment decisions (many occupations state a Certificate requirement).

Certificates reflect documented competency in specific skills, talents, or knowledges. They are often requirements for employment.

Taking The Test

A character can take a certificate test by showing up at an appropriate testing center, paying the fee, and succeeding at the test task.

Testing Centers. Most large cities have testing centers (although there is rarely a centralized testing location). The

Trade skills are tested at Labor halls, the Sciences are tested at Universities, Military skills are tested at Army (or Mercenary) bases.

The Tests. The standard tests for Certificates specify the Skill being tested and its associated Characteristic (specified by the Referee).

Certificate Types

There are four types of certification:

Qualified. A **Qualified** individual has met the minimum requirements of a skill. He must show the ability to succeed at an Easy task. When a job or vocation states a skill-related job title, a character must generally be Qualified in order to be hired.

A character with a Qualified Certificate is a Novice.

To Show Skill for Qualified Certificate (Absolute 1 hr)
Easy (1D) < Characteristic + Skill

Competent. A **Competent** individual is qualified to perform many tasks within a skill. He must show the ability to succeed at a Difficult task.

To Show Skill for Competent Certificate (Absolute 1 hr)
Difficult (3D) < Characteristic + Skill

Experienced. An **Experienced** individual is qualified to perform most tasks within a skill. He must show the ability to succeed at a Formidable task.

To Show Skill for Experienced Certificate (Absolute 1 hr)
Formidable (4D) < Characteristic + Skill

Master. A **Master** individual is qualified to perform virtually all tasks within a skill. He must show the ability to succeed at a Staggering task.

To Show Skill for Experienced Certificate (Absolute 1 hr)
Staggering (5D) < Characteristic + Skill

Cautious. Since the "test" is probably time-limited, a character may not declare it Cautious.

Cramming. A character may study prior to the test (the goal is Easy Flux as a Mod). Thus, if a character has a C+S within 5 of the required value can benefit from cramming the night before the test.

To cram for a test
DIfficult (3D) < Characteristic + Skill
Study materials required.
Success allows Easy Flux Mod on Certificate Test

Repeating Tests. Each subsequent test-taking requires a Mod -1 (the first retake = Mod -1; the second retake requires Mod -2). This process discourages characters from taking tests for which they are not qualified.

The Value Of A Certificate

Employment in standard career job descriptions requires an appropriate Certificate.

For example, in the hiring process, a prospective employer does NOT inquire, “What is your skill level in Astrogation?” Instead, he asks to see the character’s Astrogation Certificate and evaluates it (Qualified, Competent, Experienced, or Master) and whether the potential employee on that basis.

For example, a player-character may be hiring an Astrogator for his Free Trader. The referee generates (or selects from a suitable list) a series of job candidates the player evaluates them. The reasonable procedure is to compare their Astrogation Certificates.

The potential problem is the unqualified fluke. A character can conceivably perform especially well on a high level test and qualify for Experienced or even Master with a relatively low skill level.

Record Certificates with the name of the skill and the proper label (for example, Astrogator- Qualified).

EXPERIENCE

Characters continue to improve their abilities throughout their lives. The Experience process is the mechanism for this improvement.

Assumptions. The expected standard is that a character will gain one skill a year through experience. Time is tracked for each character, and the character has a birthday.

The Process

In the course of play, after each session, the referee reviews the events and notes for each player the Life Pursuit Skill best used during the session. This may reflect some negotiation as the referee and players discuss what they feel was the best use for each player. This information is recorded.

Every year, on the character’s birthday, the character reminisces about his activities over the past 365 days and reviews the Best Used skills. From this reminiscence and review, one skill will become obvious or prominent. The character receives an increase of +1 level in that prominent skill.

Alternatives. Substitute the last day of the calendar year for the character’s birthday and review for all characters at one time.

Negative Experience

The passage of time reduces some aspects of a character’s store of knowledge. At the same time that Experience is determined, apply the following negative Experience.

Every 4th year, reduce the character’s World knowledges by -1.

The Character Card

The Character Card saves and stores the basic information a player needs to know about his character. A player should have a character card for each character in play.

Human Char Card

CHARACTER CARD

UPP

Str	Dex	End	Int	Edu	Soc

Name

Breathes | Gender | Birthdate | Birthworld

Service Experience | Homeworld

Career Experience | Personal Equipment | Term01 | Term02 | Term03

Characteristics (GP) SDEIES

C1 Str	Str 2D
C2 Dex Agi Gra	Dex 2D
C3 End Sta Vig	End 2D
C4 Int	Int 2D
C5 Edu Tra Ins	Edu 2D
C6 Soc Cha Cas	Soc 2D

Senses VHST

Energy	Vision	V-16-RGB
Vibration	Hearing	H-16-9382
Volatiles	Smell	S-16-3
Contact	Touch	T-16-3
Fields	Aware	Aware String
Auras	Percept	Percept String

Skills | Term04 | Term05 | Term06 | Term06 | Term07 | Term08 | Term09

Human **Card NN**

CHARACTER CARD (BACK)

D NA=

C1	C2	C3	C4	C5	C6

Sophont Descriptor

Education or Training | Physical Aging | Mental Aging

Overview HBS-T-AN-LN-N

Symmetry Bilateral

Head Head-Brain-Senses | San

Sound

	G
	F
	E
	D
	C
	B
	A
<	9
<	8
<	7
	6
	5
	4

Certifications

Torso Torso

Limbgroup1 Arms with Hands

Limbgroup2 none

Limbgroup3 Legs

Limbgroup4 none

Tail none

Skeleton Bony Interior | Racial Scent HUM -

Skin Skin | Fluids Blood | Organic Int= Ext=

Light

D	
U	
S	
P	
B	>
G	>
R	>
C	
A	
N	
I	
F	
X	

Human **Card NN**

The Character Card

The Character Card saves and stores the basic information a player needs to know about his character. A player should have a character card for each character in play.

Sophont Char Card

CHARACTER CARD UPP

C1	C2	C3	C4	C5	C6

Name

Breathes | Gender | Birthdate | Birthworld

Service Experience | Homeworld

Career Experience | Personal Equipment | Term01 | Term02 | Term03

Characteristics (GP) | Senses | Skills | Term04

C1 Str Str		Energy Vision	Vision String	Term05
C2 Dex Agi Gra		Vibration Hearing	Hearing String	Term06
C3 End Sta Vig		Volatiles Smell	Smell String	Term06
C4 Int Int		Contact Touch	Touch String	Term07
C5 Edu Tra Ins		Fields Aware	Aware String	Term08
C6 Soc Cha Cas		Auras Percept	Percept String	Term09

Card NN

CHARACTER CARD (BACK) DNA=

C1	C2	C3	C4	C5	C6

Sophont Descriptor

Education or Training | Physical Aging | Mental Aging

Overview

Symmetry

Head | San

Sound

	G
	F
	E
	D
	C
	B
	A
<	9
<	8
<	7
	6
	5
	4

Certifications

Torso

Limbgroup1

Limbgroup2

Limbgroup3

Limbgroup4

Tail

Skeleton | Racial Scent -

Skin | Fluids | Organic Int= Ext=

Light

D	
U	
S	
P	
B	>
G	>
R	>
C	
A	
N	
I	
F	
X	

Sophont **Card NN**

Clones

A clone is a sophont genetically identical to a single or donor parent sophont. It has the same genes as its parent. Clones fill important social, economic, and medical functions in society.

The concept of clone embodies an organic reproduction or recreation of a single individual. The genes of the original are used to create one or more duplicates.

CLONE TYPES

There are five general types of clones:

Natural. Clones occurring naturally.

Offspring. Clones produced as children.

Relict. Clones intended to replaced dead individuals.

Guest. Clones produced to provide cheap labor.

Meds. Clones produced to provide medical parts.

Natural Clones

occur without the intervention of technology. Identical twins are natural clones (of each other rather than of a parent). The children of Solitaires (sophonts with only one gender) are natural clones. Natural clones are birthed as children and proceed naturally through all life stages.

For example, citizens Sean and Filis Netzel meet, fall in love, and marry. After a suitable period, they have their first child. Actually, their first child turns out to be two: identical twins. Identical twins are natural clones of each other.

For example, Knuma is a Dantionite from Thestrouroura (Tickstap 7 [A3 V]). This species has a single gender (=Solitaire). Knuma has a litter of four pups, each genetically identical to the parent. They are natural (and offspring) clones.

Natural Clones have natural organic bodies, natural brains, and naturally formed personalities.

Playing Natural Clones. Two or more players may decide to play identical sibs: twins, triplets, litter mates. A single set of characteristics is created for the natural clones, and then each player administers his individual character though the character generation process.

Offspring Clones

are deliberately created clones intended as children of individuals. They are typically created for an individual driven by a need to have offspring, but who does not care to involve other parents in the creation process. For example, a Neuter does not normally participate in child creation; it could create a child through cloning. The offspring of the Solitaire gender are natural clones (and offspring clones).

Offspring clones are birthed as children and then proceed through all normal life stages.

For example, merchant captain Eneri Dinsha travels the starlanes and has never settled down; co-incidentally he has never found a suitable mate. As he approaches Life Stage 5, he feels, and acts on, his instincts to have a family. He visits a doctor's office on Regina and makes the necessary arrangements. Nine months later, he returns to Regina and takes delivery of his new son. The first few years are both harrowing and exciting, but the ship's crew lends its help, and soon Eneri's son Ank is a junior member of the crew, helping with cargo handling, food preparation, and eventually helping on the bridge. Ank Dinsha is an offspring clone.

For example, a Neuter in the gender structure Female-Male-Neuter does not normally participate in reproduction and child creation; it could create a child through cloning.

Offspring Clones have natural organic bodies, natural brains, and naturally formed personalities. Offspring clones progress normally through childhood.

Offspring clones are always the same gender as the parent.

Playing Offspring Clones. A player whose character has reached Life Stage 9 may decide to continue adventuring as an offspring clone of the original character.

Relicts

are deliberately created clones intended to replace an existing individual (typically one who is dead or incapacitated). The pattern provides genetic material samples and a personality, memory, and skill recording.

Relicts are not created until the pattern has died or disappeared. When a pattern dies, a relict is force-grown to Life Stage 3 and implanted with the pattern's recorded personality (including memories and skills).

A relict preserves memories and is an effective duplicate or replacement for the pattern.

For example, Star Marine Captain Sir Mountain Dressler III is employed in a dangerous profession and he quite responsibly has bought life insurance. Before what came to be known as the Retreat from Jewell, he spoke with an agent and made the appropriate arrangements. Dressler acquitted himself heroically, and was awarded the MCG. In the last days of the campaign, Dressler held off the enemy, protecting his Infantry Company as they boarded the retrieval cutters. Dashing for the loading doors, he was cut down in enemy plasma gun crossfire.

His unit, when it returned to base, notified his insurance company, which used its cell samples to force-grow a new body and then implant into it his personality and memories. About a year later, he returned to duty wearing his newly won MCUF, his Battle Ribbon (and a Wound Badge) on his dress uniform (but with no memories of the entire campaign).

Relicts have force-grown organic bodies, cloned brains, and implanted personalities (a recording of the original personality).

Playing Relicts. Life Insurance activates a Relict when a

verified report of death or disappearance is made to the company. The activated Relict has the memories and skills of the original and becomes owner of the original's property.

Guests (as in Guest Workers)

are deliberately created clones intended as cheap laborers. A suitable pattern provides genetic material samples and a personality and skill recording.

Guests are force-grown from genetic material samples and implanted with an edited recorded personality (typically personality and skills but not memories). A guest is a skilled duplicate of the pattern, lacking only the memories of the original.

For example, during the Second Frontier War, Zhodani and Imperial forces repeatedly held, lost, and retook strategic positions on Arden. Thousands of soldiers on both sides were killed. Local trading company Lant Partners saw an opportunity for profit in midst of all this destruction and collected cell samples and brainscans from several dozen of the dead (some were actually not quite dead when the samples and scans were taken). The result was a bonanza: dead soldiers became guest security guards and bodyguards; dead technicians became guest factory workers; a dead doctor became a series of sorely needed medical staffers.

For example, Antilles Rahban grew up on Boughene, the child of prospectors in the copper-rich Swalian Mountains; he was the operator of a small copper mine for more than 40 years. Both strong and smart, he was good at what he did, and he enjoyed his work. When Naasirka opened a much larger mine, it needed more skilled workers than the planet could provide, and they struck a deal with Rahban: in return for his cell samples and brainscan, they provided him with a new cloned body and bought out his mine for enough to support him reasonably well for the rest of his life.

Naasirka's Rahban Mine (they named it after him) is staffed by a workforce of strong smart Rahban clones, each implanted with the proper skills and a personality which enjoys its work. Naasirka's cost-benefit analysis was confirmed: it was cheaper to create a clone workforce than to recruit, transport, and train hundreds of offworlders.

Guests have force-grown organic bodies, cloned brains, and edited implanted personalities (an edited recording of the original personality). Guests are typically sterilized when created.

Playing Guests. A character may be a Guest. Although memories are supposed to be edited out of the personality, the process sometimes fails.

Meds (as in Medical Clones)

are clones deliberately created as reserves of medical replacement parts. When a pattern requires medical repair parts, a med is force-grown to Life Stage 3 and then used to provide replacement parts.

For example, after a terrible groundcar accident, AcLama Stigh and Destiny Arrcher both lay in autodocs with extensive injuries. AcLama was 62 years old: the doctors took tissue samples and force grew a completely new clone body over about 18 weeks. When it was ripe, they implanted his brainscan into the new body and allowed the old one to expire. Destiny is 24 and her injuries are confined to the left leg. The leg is removed and replaced with a mechanical. Once the clone body is ripe, her leg is replaced with a clone leg and the rest of the clone body is destroyed.

Playing Meds. Meds are rarely played. The occasional med may escape its force-growth chamber.

THE DETAILS OF CLONES

Clones may be characters.

Genetic Duplication

It is possible that a clone is not an exact duplicate of an existing sophont (the pattern) since only the genetics are duplicated. Cloning duplicates the genetic values of the pattern and dice create the remainder of each characteristic.

For each characteristic, the remainder (the other dice) are rolled normally. Non-genetic characteristics have a value of zero (for example, C5=Education).

For example, the original Eneri Dinsha 777777 has each characteristic created with 2D. For each characteristic, the first D was 3 and the second D was 4. Eneri's genetic UPP is 3333XX.

When creating nine clones of Eneri, the non-genetic D is rolled individually. Implanting Eneri's personality provides the Edu and Soc.

THE NINE CLONES OF ENERI DINSHA

Who?	Dinsha = 777777 Genetic=3333XX	
Clone01	444777	< minimum
Clone02	455777	
Clone03	484777	
Clone04	599777	
Clone05	566777	
Clone06	685777	
Clone07	757777	
Clone08	884777	
Clone08	899777	
Clone09	999777	<maximum

Seven randomly generated clones of Eneri Dinsha, plus the minimum and maximum possible UPPs.

Each of the clones "thinks" he is Eneri Dinsha. Some of them will remember different Strength or Dexterity and soon realize that he is not the original. Others may persist in believing he is the original.

Clone Intelligence. A clone possesses its native (genetic) Intelligence. The Forced-Growth process does nothing to increase that intelligence so a clone freshly made has only genetic intelligence.

Personality Implants. Once fully grown, a clone is implanted with its personality which provides it C4 C5 and C6.

Natural Life Stages. Natural and Offspring Clones proceed through the Life Stages in ordinary time. They generate C5 normally. They generate C6 according to the specific non-genetic inheritance rules.

Force Growth. It is possible to speed up the growth of organics. A Metabolic Chamber (the standard device for creating clones) can accelerate growth to about one year per week.

Natural Gestation Periods. The human gestation period is nine months. If a gestation period is necessary for a non-human, calculate it using sophont size as a percentage of nine months. For example, a Size 50 sophont has a pregnancy of (50% of 9 months) = 4.5 months.

Some parents prefer that the pregnancy proceed in a laboratory, and some prefer it be forced-growth.

Natural Or Forced-Growth?

Natural Clones and Offspring Clones mature naturally. They pass through each Life Stage in real time.

Relicts and Guests would be relatively useless concepts if they could not be rapidly made available.

Clones can be force-grown in a Metabolic Chamber (at one year per week) to Life Stage 3.

A Force-Grown clone body has no developed personality. Without a personality implantation, it has C5=0 and C6=0.

Aging

Cloning accelerates the aging pattern of the individual.

Physical aging begins at Life Stage 4 (one stage earlier than the pattern). Age is the biological age of the newly produced body. Physical aging applies to characteristics C1 C2 C3.

Mental aging begins at Life Stage 8 (also one stage earlier than the pattern). Mental aging applies to Intelligence.

Natural and offspring clones are not subject to accelerated clone aging.

Reproduction

Natural and Offspring Clones and Relicts reproduce normally under the same circumstances as their pattern.

Guests are typically sterilized during the force-growth process. However, their innate genetic material allows them to be cloned.

Injuries and Healing

Clones can be injured in the same way as their pattern sophonts. They heal in the same way as well.

Identifying Marks and Controls

The clone creation process itself imposes no special identifying markings. Natural and Offspring clones are almost never given unique or identifying markings.

Relict Markings. A Relict may be given an unobtrusive marking for identification purposes (typically a tattoo); obvious markings would frustrate the purpose of a Relict.

Guest Markings. A Guest may be given markings for identification purposes. Guest markings are usually visually obvious (large tattoos).

Med Markings. A Med is typically unmarked.

THE TECHNOLOGY OF CLONING

	TL	
High Tech	10	
	11	
	12	Personality Recording and Editing.
VhighTech	13	Cloning. Forced Growth. Wafer Technology.
	14	Geneering.
	15	
Xhigh Tech	16	Artificial Intelligence.
	17	
	18	

CREATING CLONES

A clone is a duplicate of an existing sophont (the pattern). Cloning duplicates the genetic values of the pattern and dice create the remainder of each characteristic.

For example, for a human pattern the Genetic Characteristics and their values are known (or can be determined). These values form the base for clone creation.

For each characteristic, the remainder (the other dice) are rolled normally. Non-genetic characteristics have a value of zero (for example, C5=Education or C5=Training).

Natural Life Stages. Natural and Offspring Clones proceed through the Life Stages in ordinary time. They generate C5 normally. They generate C6 according to the specific non-genetic inheritance rules.

Natural Variation. A clone is not identical to its pattern. The natural variation added to the gene means that a final characteristic can be much different from the original's characteristic.

CREATING A CLONE

A human (or sophont) clone can be created from available information.

Required Information. SCC for humans (or sophont). UPP, skills, and knowledges for a specific human (or sophont). Genetic Profile for a specific human (or sophont).

Natural Clone

C1= DNA + 1D (or as required for the sophont).
C2= DNA + 1D (or as required for the sophont).
C3= DNA + 1D (or as required for the sophont).
C4= DNA + 1D (or as required for the sophont).
C5= 2D (or as required for the sophont).
C6= Soc = Parent. Cha or Cas generated per Chargen.
Gender= random.
Personality= new with this person.

Offspring Clone

C1= DNA + 1D (or as required for the sophont).
C2= DNA + 1D (or as required for the sophont).
C3= DNA + 1D (or as required for the sophont).
C4= DNA + 1D (or as required for the sophont).
C5= 2D (or as required for the sophont).
C6= Soc = Parent. Cha or Cas generated per Chargen.
Gender= random.
Personality= new with this person.

Relict

C1= DNA + 1D (or as required for the sophont).
C2= DNA + 1D (or as required for the sophont).
C3= DNA + 1D (or as required for the sophont).
C4= implanted from original.
C5= implanted from original.
C6= implanted from original.
Gender= is the same as the original.
Personality= implanted recording from original = C4 C5 C6.

The Relict has the same personality C4 C5 C6 as the original, including skills and knowledges. It has the same memories as the original, but only to the date of the personality recording.

If this relict were somehow released before being implanted with the original's personality, it would have C4 Int = Genetic C4. C5 Edu =0. C6 Soc =0.

Guest

C1= DNA + 1D (or as required for the sophont).
C2= DNA + 1D (or as required for the sophont).
C3= DNA + 1D (or as required for the sophont).
C4= edited implant from original.
C5= edited implant from original.
C6= edited implant from original.
Gender= same as the original.

The personality for the Guest is edited. It usually has the same personality C4 C5 C6 as the original, including skills and knowledges. Typically, memories have been removed.

Med Clone

C1= DNA + 1D (or as required for the sophont).
C2= DNA + 1D (or as required for the sophont).
C3= DNA + 1D (or as required for the sophont).
C4= 0
C5= 0
C6= 0
Gender= same as the original.
Personality= none.

Chimeras

A chimera is a hybrid of two or more distinct species. Alternatively, a chimera is a sophont who has been significantly altered through the inclusion of genetic material from one or more other species (not necessarily sophonts).

A Chimera (pronounced ky-MEER-a, for those with Edu 6 or less: CHIM-er-a) is the result of significant or substantial genetic mixing; it may be natural or geneered.

A **Natural Chimera** is the result of interspecies fertility. Interspecies fertility creates offspring which share some of the details of each species, including senses, body structure, and other elements. In the majority of cases, such offspring is non-viable. When it is viable, it is often sterile. When viable and non-sterile, it breeds true with other viable, non-sterile individuals.

For example, members of two distinct sophont species are inter-fertile (and can create children) if they both have the same Genetic Profile (human = SDEIES). Such activity is rare and may need to overcome specific interface obstacles (perhaps through in vitro fertilization).

Natural Chimeras have natural organic bodies, natural brains, and naturally formed personalities. They function in all respects as a natural sophont.

Natural Chimerism may be used to explain why a sophont has specific abilities or characteristics.

A **Geneered Chimera** is the deliberate result of genetic engineering to combine aspects of two or more distinct species. Genetic Engineering can select genetic features from existing species (not necessarily both sophonts) and combine them to create a new organism.

For example, a colonial development organization intent on exploiting the natural resources of a world could genetically engineer an existing sophont which breathes Air-3 to incorporate from other sophonts such capabilities as high Strength, high Endurance, and Vision in IR bands.

THE DETAILS OF CHIMERAS

Minor or minimal geneering is a natural part of any technological society. Genetic editing to remove minor disabilities or for minor cosmetic enhancements is commonplace. However, when significant genetic material from other organisms is grafted onto a being, the result is a chimera.

Chimeras can be cloned.

Chimeras can be characters.

Viability. It is possible that the process to create a Chimera will produce a non-viable result. For example, the random selection of head and torso between the two precursors of the chimera may result in no brain. Such efforts are failures.

Aging. Chimeras age according to the hybrid Life Stages structure on the Sophont Creation Card

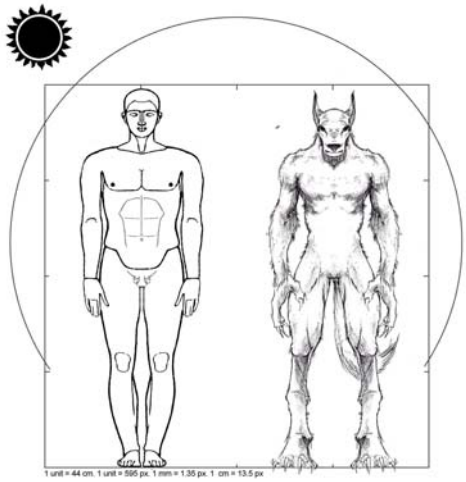
Reproduction. Chimeras reproduce normally under the same circumstances as their pattern.

Injuries and Healing. Chimeras can be injured in the same way as their pattern sophont. They also heal in the same way.

Identifying Marks and Controls. The chimera creation process itself imposes no special identifying markings or control codes.

PLAYING CHIMERAS

A Chimera can be played like any other sophont. The details of its location and origins are created as necessary.



ARE VARGR CHIMERAS?

It is generally accepted that the Vargr are an intelligent Major Race created by the Ancients through genetic manipulation of Terran carnivore/chasers at about the same time humans were scattered from Terra to the stars. Over time, researchers have confirmed that Vargr are genetically derived from family Canidae and almost certainly genus Canis (that is, wolves or proto-dogs).

The Unanswered Question. With geneering accepted as the origins for the Vargr, the question arises about precisely what that genetic manipulation was: Did it manipulate existing genetic structure to favor an upright stance and opposable thumbs? Did the Ancients so completely understand genetics and molecular biology that they simply wrote or created new genes to insert into Earth's proto-dogs? Or, did those Ancient genetic engineers do what modern geneers do? Did they take the nearest available compatible genes for hands, and upright stance, and increased intelligence?

Are Vargr Human-Wolf chimeras?

CHIMERA ALLOCATION CHECKLIST

Use this checklist to control creation of Natural or Geneered Chimeras. The processes are nearly identical; differences (only) for Natural Chimeras are shown. Create a blank Sophont Creation Card for the Chimera being generated.

	Geneered	**Natural**
1.	Select two Sophont Creation Cards	
	A. with identical NA.	A. with identical Genetic Profile and Nucleic Acid.
	B. Identify them as Pattern1 and Pattern2.	
2.	Allocate Basic Information from the SCC.	
	A. Niche and Subniche. Enter <Geneered Chimera>.	A. Niche and Subniche. Enter < Chimera>.
	B. Native Environment / Locomotion. Select.	B. Native Environment / Locomotion. Select.
	C. Breathes. Select.	C. Breathes. Randomly select.
	D. Genders. Select.	D. Genders. Randomly select.
	E. Castes. If present, Select.	E. Castes. If present, randomly select.
	F. Racial Scent.	
	Combine the Pattern1 PON and Pattern2 PON.	
3.	Characteristics and Characteristic Dice.	
	Select from the available entries.	Randomly select from the available entries.
4.	Senses.	
	Select from available entries (including blanks).	Randomly select available entries (including blanks).
5.	Body Structure. Select from the available entries.	5. Body Structure. Randomly select from available entries.
	Symmetry	
	Head	
	Torso	
	Limbgroups 1-2-3-4.	
	Tail.	
	Skeleton.	
	Skin.	
	Body Fluids.	
6.	Life Stages. Select from the available patterns.	6. Life Stages. Randomly select from available patterns.
	Recalculate Life Expectancy.	
7.	Card Back.	
	Insert information for Gender Structure	
	Insert information for Caste Structure.	
8.	Analyze for Viability.	8. Analyze for Viability. Discard non-viable Chimeras.

Identical Genetic Profile= All Genetic components of the Profile are the same. For example, SDEIES and SDEITC are identical because C5 Education and C6 Social Standing are not Genetic and C5 Training and C6 Charisma are not Genetic.

The Technology Of Geneered Chimeras. Geneering is practical at TL 14.

THE NEW SOPHONT CREATION CARD

The final information on the Sophont Creation Card is filed. Proper identifying information should be added as necessary.

Synthetics

A synthetic is an organic- or biologically-based artificial being created or manufactured according to a master template or blueprint. **Synthetics** are blends of biological and non-biological processes (the proportion may vary). For example, a synthetic may use biological processes to produce energy but have a mechanical pump to circulate blood. Synthetics are distinguishable from clones (duplicates created from existing genetic templates), chimeras (the result of genetic engineering), and robots (truly mechanical or non-organic beings).

Just How Synthetic Is Synthetic?

Many organic sophonts have mechanical or non-organic components (replaced teeth, replaced joints or bones, prostheses, a heart pacemaker, an insulin pump). Many robots have organic-based components (smell processors, organic brains). The generally accepted guidelines are:

A being (natural, clone, or chimera) remains organic despite the replacement of body components with non-organic parts if the majority of functions are organic.

A robot remains robotic with up to one-third organic components. The most common organic component for a robot is an organic brain.

A synthetic or semi-organic lies between organic and robotic.

While sophontoids appear externally similar to the sophont on which they are patterned, they are internally and macroscopically dissimilar. Internal process, organs, and fluids are all independently designed and created using alternative methodologies. In addition, a semi-organic is incapable of reproduction.

TERMINOLOGY

Several terms refer to synthetic beings:

Synthetic. An artificial being blending organic (living) and mechanical (non-living) elements. Synthetic refers to the general class of created beings between natural and robotic.

Android. Specifically, a synthetic human. Technically, android is a synthetic male human; a synthetic female human is a gynoid.

Sophontoid. A synthetic sophont. Sophontoid is an expansion of the word android to encompass all sophonts rather than just humans.

Semi-Organic. A combination of organic and mechanical components. Literally, half-organic. A synonym of synthetic when applied to beings. Semi-organic refers to the nature of components or devices which blend organic and non-organic elements. A semi-organic brain adds electronics to an organic brain to enhance its capabilities.

TYPES OF SYNTHETICS

There are three general types of synthetics: Faux, Organic Devices, and Sophontoids.

Faux (Imitation Animals)

A **Faux** (one is pronounced Foe; several together is Foes; they are spelled the same either way) (characters with C5=6 or less say **Fox**) is an imitation animal; a semi-organic simulacrum (plural = simulacra) of a non-intelligent being.

For example, a synthetic guard dog can be produced with greater survivability than a biological dog; a synthetic transport beast may be superior to a horse or mule.

Imitation animals have some organic and some mechanical components. They are directed by semi-organic brains and implanted personalities.

Using Imitation Animals. Imitation animals are encountered in the course of ordinary events.

Organic Devices

An **Organic Device** is a synthetic object which performs some activity using biological processes.

For example, a semi-organic voice amplifier may have superior qualities when compared to an electronic amplifier.

Other examples are: small room cleaners, intruder sensors, a water filter/purifier, and lawn trimmers.

Organic devices have some organic and some mechanical components. They are directed by semi-organic brains and implanted (rudimentary) personalities.

Encountering Organic Devices. Organic Devices are commonly encountered in the course of ordinary events; they may be commonplace, and often ignored.

Sophontoids

A **Sophontoid** is a semi-organic imitation of a sophont. It is an artificial sophont built for specific purposes (for example, cheap labor under special or extreme conditions).

For example, a company may endeavor to create a low-cost imitation human. Based on an existing human, the android (the term for a human sophontoid) has the general human body structure, but makes use of a mechanical pump to circulate body fluids. It is controlled by a circuitry-enhanced animal-derived brain.

Sophontoids have semi-organic bodies, semi-organic brains, and implanted personalities.

Playing Sophontoids. A sophontoid may be a character.

HOW THEY BUILD SYNTHETICS

Naasirka Regina (a synthetic manufacturer) sees a market need for a small semi-organic room cleaner.

They select a common mouse as the starting point and begin the process. The rudimentary personality of the mouse is recorded, the mouse is cloned several hundred times, and the personality is re-implanted. The mice are trained on basic tasks (obeying instructions, avoiding moving objects and people). These multiple personalities are them recorded, edited, and integrated to create a basic mouse personality with the best of the learned behaviors.

The Semi-Organic Body. A semi-organic body is designed and manufactured. It includes a self-healing outer skin, multiple retractable legs for stability, basic sensors to detect edges and prohibited areas, and a pouch to store dust and floor dirt.

An organic power system is designed to take nutrient from a fixture in the nest and to deposit waste in the pouch.

The Semi-Organic Brain. The mouse personality is implanted in the semi-organic brain. Because the personality is derived from the original of the cloned brain, the personality implant is permanent.

The End Product. The Naasirka-Regina NR1000 cleaning system is a system consisting of a floor level nest as home to one or more cleaners dedicated to keeping floors clean and shining. The cleaners stay out of sight whenever people are present; it is only when the room is empty that they come out and do their work. The cleaners collect dirt and dust in their internal pouches and empty it into a central receptacle in the nest. They sort larger objects (coins, small parts) from the pouch into an accessible Lost & Found bin. The cleaners live on a special nutrient fluid available only in the nest (refillable quarterly).

Other Features and Restrictions. The NR1000 has a useful life of about 10 years. The cleaners are available in a variety of colors, including licensed sports team themes.

Naasirka-Regina provides periodic upgrades to the implanted personalities (which are self-installing in the nest).

THE TECHNOLOGY OF SYNTHETICS

Effective Cloning and Forced Growth are foundations for the organic components of synthetic; these technologies cluster around TL-13. Mechanical and electronic components are available at earlier levels.

THE DETAILS OF SEMI-ORGANICS

The term semi-organic is generally used with Faux and with Organic Objects. Intelligent semi-organics are usually called sophontoids.

There is usually no purpose to non-sophontoids as characters; sophontoids, however, can be quite interesting.

Production

Semi-Organics are produced at a factory using a set of master plans or master drawings. The commonly used term for a semi-organic factory is **vat** (the concept that semi-organics are grown in a vat is inaccurate but widespread).

Manufacture. Semi-Organics are manufactured. When they leave the vat they are in final operable form, fully trained, and fully capable of fulfilling their intended functions.

Reproduction. Semi-Organics are incapable of reproduction.

Cloning. Because some components are non-biological, semi-organics cannot be easily cloned.

Injuries and Healing

Semi-Organics can be injured in the same way as other biological beings can.

Semi-Organics usually have an outer covering (skin) capable of healing. Organic internal organs can also heal; and they can be cloned for replacement. Non-organic components which are damaged require repair or replacement.

THE DETAILS OF SOPHONTOIDS

Sophontoids are produced at a factory using a set of master plans or master drawings. The commonly used term for a sophontoid factory is **vat**. The concept that sophontoids are actually grown in a vat is inaccurate but nonetheless widespread.

Manufacture. Sophontoids are manufactured. Various components are grown or fabricated, and the sophontoid comes to life with the installation of the semi-organic brain. They begin life in adult form, fully trained and capable of performing their intended duties.

Before leaving the factory, a sophontoid receives a basic education or training consisting of a total of _12_ skill levels (for batch sophontoids) or _18_ skills (for premium sophontoids) distributed across any number of skills and knowledges. Sophontoids which do not meet this level of quality or achievement are terminated as substandard.

A sophontoid has no memory of events prior to leaving the factory. Its first memory is of the final production chamber at the factory immediately prior to being sent into the world.

Reproduction. Sophontoids are incapable of individual reproduction. Some sophontoids are the product of a profit-making organization with little access to, or knowledge of, their native factory. Other sophontoids have acquired access to their factory and control its central reproduction policies.

Sophontoids may have external gender characteristics, or they may lack any specific gender characteristics.

Semi-organics cannot be cloned using normal processes; their organic components may be cloned; distinct components may have distinct genetic structures, each of which must be cloned separately; finally, non-organic components must be manufactured and added.

Injuries and Healing

Sophontoids can be injured in the same way as their pattern sophont.

Sophontoids have an outer covering (skin) capable of healing. Organic internal organs can also heal. Non-organic components which are damaged require repair or replacement.

The sophontoid brain is a manufactured semi-organic brain:

Identifying Marks and Control Codes

Local law level and culture determine the markings and control codes for sophontoids.

Markings. Markings are applied at the factory. Sophontoids have markings which allow them to be identified as sophontoids. Batch sophontoids have one obvious marking and one unobtrusive marking (as a backup or

confirmation). Premium sophontoids, intended to blend more fully into society, have one unobtrusive marking.

For example, a sophontoid may be created to eat marginal foodstuffs (spoiled foods, bulk cellulose, common non-food plants), or specially formulated foods (spiked with exotic chemicals). A sophontoid may require biological process supplements (to support or drive internal processes).

Control Codes. Control codes are installed at the factory. Every sophontoid has an installed control code. Although the original intent was that such codes be secret, integration of sophontoids into society means that each sophontoid probably knows the control code that applies to him.

SOPHONTOID IDENTIFYING MARKINGS

	<applies to skin>	
Flux	Obvious Markings	Unobtrusive Markings
- 5	Spots Overall	Tattoo- Hidden
- 4	Conspicuous Patterns	Tattoo- Inconspicuous
- 3	Blotches	Minor
- 2	Multiple Marks	Internal RFID
- 1	Prominent Mark	Internal Scannable Chip
0	Pigmented Skin	Local ID marking
+1	Patterned	Verbal Trigger
+2	Subtly Patterned	Touch Point Disable
+3	Subtly Colored	Scent Trigger
+4	Unpigmented	Visible Pattern Trigger
+5	Transparent Skin	IR Hotspot

A Batch Sophontoid has BOTH one Obvious Marking and one Unobtrusive Marking.

A Premium Sophontoid has one Unobtrusive Marking.

SOPHONTOID CONTROL STRUCTURES

Flux	Non-Standard Behavior or Requirement	When
- 5	Accumulated Waste Residue Flush	annually
- 4	Organic Chemical Supplements	daily
- 3	Dietary Supplements	daily
- 2	Hormone Supplements	monthly
- 1	Eats spoiled or substandard foods	
0	Eats a specific geneered plant	
+1	Internal Energy Cell Recharge	daily
+2	Internal Energy Cell Recharge	weekly
+3	Tailored scent input	weekly
+4	Coded Strobe Light Incapacitation	
+5	Coded Sound Pattern Incapacitation	

CREATING SOPHONTOIDS

Sophontoids are created by the factory according to a model or pattern which details the values for its characteristics. Typically, sophontoids are created in “batches” of about 100. Sophontoids from the same batch have a special bond and consider themselves brothers (or sisters or sibs).

Creating a sophontoid involves determining what values best emulate the pattern.

Available Characteristics. The sophontoid manufacturing process creates characteristics C1 C2 C3 and C4. Characteristics C5 and C6 are “empty” and set to 0.

The Process. The producing factory creates a pattern or master plan for the sophontoid characteristics where the sum of the characteristics C1 C2 C3 C4 equals 3.5 times the dice rolled for those characteristics in the sophont pattern.

For example, a factory chooses to produce a laborer android based on a human. A human character rolls for C1 C2 C3 C4 a total of 8 dice (= 8 * 3.5) = 28 points. The factory allocates Str= 10 Dex =6 End = 8 Int=4. Edu and Soc remain at zero.

Batch Produced Sophontoids

The factory routinely produces sophontoids in batches of about 100 based on market orders or perceived market needs.

Identify the market need for the sophontoid (for example, laborer, servant, soldier).

Determine the total number of dice rolled for characteristic C1 C2 C3 C4 for the sophont. Multiply that number by 3.5 for the total points available for characteristics. Distribute those points among the characteristics based on the market need.

Select one or more skills (based on market need) and allocate a total of 12 skill levels among those skills.

Determine the identifying markings and control codes for the batch and apply them to the sophontoids.

Premium Sophontoids

The factory produces high quality sophontoids in batches of about 10 based on specific orders.

Identify the market need for the sophontoid (for example, astrogator, librarian, bodyguard).

Determine the total number of dice rolled for characteristic C1 C2 C3 C4 for the sophont. Multiply that number by 3.5 and add 10 for the total points available for characteristics. Distribute those points among the characteristics based on the market need.

Select one or more skills (based on market need) and allocate a total of 18 skill levels among those skills.

Determine the identifying markings and control codes for the batch and apply them to the sophontoids.

Randomly Encountered Sophontoids. Any randomly generated sophont can conceivably be a sophontoid.

Genetics

The characteristics of **Traveller** characters have both a generated component and an inherited component. The inherited (or genetic) component can be passed from generation to generation by characters.

The inherited components (the genes) of characteristics enables a player to create characters in other historical milieux with demonstrable links to the player's primary character. They also allow characters to create children through which they can continue role-playing after the demise of the original character. Genetics also allows the creation of clones.

IMPORTANT TERMS

The following terms are important for the understanding of genetics.

Gene. The individual inherited value for a genetic characteristic. Human Strength is generated with 2D: the first die (1-6) is the inherited part of Strength and that value is the Gene. The second die (1-6) is the developed Strength based on experience and environment.

A normal Gene has a value from 1-6. Higher and lower values can occur though mutation or geneering.

A Gene with a value of 0 is *defective*.

Genetic Characteristic. A characteristic which has some basis in genetics. Strength is a genetic characteristic because part of it is determined by genetics; Education is NOT a genetic characteristic because genetics does not determine Education.

Genetic Profile. The initial letters of the characteristics for a species. For humans (with Str Dex End Int Edu Soc) this is SDEIES. One Genetic profile is identical to another Genetic Profile if both have identical Genetic elements; it disregards non-genetic elements.

For example, SDEIES and SDEITC are identical. SAVIIC and SAVIIS are identical. SGSITS and SGSIIS are not identical.

DNA. A variation of the UPP which shows the values for Genes. / Inherited D. Non-genetic characteristic positions are shown as X.

For identification, the DNA string is preceded by the letters DNA.

Since some sophont genetics are based on variants of DNA, the string may instead be preceded by 1NA, 2NA, 3NA, 4NA, 5NA or 6NA (the number indicating the number of participating genders for the species), or MNA (= 1NA), DNA (=2NA), or TNA (=3NA). For convenience, the term DNA also means all of the alternative terms.

For example, the digit in the C1 position of DNA is the Strength Gene.

Inherited D. The portion of a characteristic which is determined by genetics. Also called a Gene.

Generated D. The portion of a characteristic which is not a Gene or Inherited D.

GENETIC TERMS

	C1	C2	C3	C4	C5	C6
Genetic Profile=	S	D	E	I	E	S
DNA-	3	2	4	6	X	X
Die Rolls=	4	6	5	4	5+6	6+6
UPP=	7	8	9	A	B	C

This table shows Humans.

THE BASIC PRINCIPLES OF GENETICS

Characteristics are generated with one or more dice. For humans, Strength is generated with 2D. For some non-humans, Strength may be generated with 1D, 2D, 3D, or even 4D.

The first D rolled for a genetic characteristic is the **Gene** for that characteristic. The remaining D for the characteristic represent training, experience, and environment.

For example, human Strength characteristic is generated using 2D. 1D is the genetic component inherited from generation to generation. The other 1D is the generated component and rolled on 1D when the character is created.

For example, human Eneri Dinsha inherits a Strength gene =4 from his father. When Eneri is generated, the player rolls 1D =3 for Strength =7.

Creating Characters Without Using Genetics. When creating characters (for example for the first time) without genetics, all the required dice are rolled normally. The Genes can be determined later or as necessary through Genetic Testing.

Genes. Genes can be inherited from parents and passed on the offspring. Genes are used when creating clones.

Mutation and Genetic Engineering. Each Gene is originally generated with 1D. It may increase or decrease as a result of mutation or genetic engineering. A Gene with a value of 0 is *defective*.

The Genetic Characteristics. A Genetic Characteristic is genetically inheritable.

The Physical Characteristics C1 C2 and C3, Intelligence C4 and Instinct C5 are genetic characteristics. Caste C6 may (or may not) be genetic.

Education C5, Training C5, Social Standing C6, and Charisma C6 are not genetic.

GENETIC CHARACTERISTICS

	Genetic			Non-Genetic	
C1	Strength				
C2	Dexterity	Agility	Grace		
C3	Endurance	Stamina	Vigor		
C4	Intelligence				
C5	Instinct			Education	Training
C6	Caste*			Social	Charisma

* Caste may be Genetic or Non-Genetic.

If the character has Caste and it is marked Genetic for that species (in a detailed description of that sophont), it is Genetic; otherwise, it is not.

DNA (or MNA, and others)

Genes for a character are recorded as DNA (a six-digit UPP string preceded by DNA- (non-genetic components are shown as X). For example, human Eneri Dinsha has DNA 4456XX.

Alien DNA. The name DNA (Di- ribo Nucleaic Acid) refers to the double helix self-replicating molecule. DNA is a double because it has components supplied by two genders.

If genetic components are supplied by more than (or less that) two genders, then the proper name for DNA changes. For ease of reference, DNA in a general sense includes all the other possible NA structures.

The six-gendered Plexxan would show its Gene sequence as 6NA-5346X9 (note the 9 in position C6 indicates the Plexxan have a genetic Caste structure).

HUMAN AND ALIEN DNA

Gender Structure	Genetic Component
Solitaire	MNA or 1NA
Dual	DNA or 2NA
FMN*	DNA or 2NA
EAB	TNA or 3NA
Group**	1NA 2NA 3NA 4NA 5NA or 6NA

* because the Neuter does not participate.

** depending on the number of participating Genders.

1D Characteristics. If Sophont Generation dictates that a characteristic is rolled with 1D, then all of that value is the Gene, and there is no Generated D.

Gene Contributions By Non-Humans. If the parents are non-human sophonts, then variations are possible based on Gender.

For any gender with two or more components, the appropriate Gene is selected from the available values of all possible parents. However, Neuter Gender is always ignored and cannot contribute a Gene. Bearer Gender can contribute a Gene (during the bearing process). Gender One in the Solitaire Gender Structure always contributes all of the Inherited D.

DETERMINING THE VALUES FOR GENES

The values for Genes can be determined during characteristic generation, or later through Genetic Testing.

During Character Creation. Ideally, when a new character is created, the first D rolled is the Gene and should be recorded on the character's Genetics Card.

For example, when the human character Gustav Winkhoek is generated, the player rolls 2D for Str producing 3 and 4. The first D rolled (3) becomes the Strength Gene. When sophont Plexxan is generated (with 3D for Str), the player rolls 5, 4, and 3. The first D rolled (5) is the Strength Gene.

Genetic Testing. If Genes were not noted during characteristic generation, they may be determined through testing.

Genetics Testing is a formal situation under the guidance of a referee, the player rolls 1D for each Genetic characteristic and enters the values on the Genetics Card. The referee takes care to avoid contradictions (such as: the Gene becoming greater than the present characteristic).

Obvious Genetic Values

Some genetic values can be deduced. Some examples are shown below, and other values can be logically deduced as well.

Characteristic Created With 1D. If a characteristic is created with 1D, then its entire value is a Gene.

2D Value = 2. The Gene = 1.

2D Value = 12. The Gene = 6.

3D Value = 3. The Gene = 1.

3D Value = 18. The Gene = 6.

CREATING HUMAN OFFSPRING

When two Human characters mate and generate a child, that child character randomly acquires the Gene of a characteristic from one of his parents.

For example, two human parents marry and have a single child. For each of Strength, Dexterity, Endurance, and Intelligence, a random roll determines if the Gene comes from the father or the mother. In this example, assume the roll result alternates father and mother as the donor.

Mother (Parent1)	Father (Parent2)
Aia Restef	Gustav Windhoek
DNA-3456XX	DNA-6543XX

Child
Stephan Windhoek
DNA-6446XX

On this genetic base, the player for Stephan Windhoek rolls for the complete UPP. Since humans roll 2D for characteristics, Genes are determined by genetics; the Generated D is rolled with 1D by the player to create the final UPP.

Creating Parents. It is also possible to create parents for an existing character. Given an existing DNA-, random rolls are used to determine which Genes were received from which parent. Those which were not genetically determined are created by random die rolls.

Recording Genes. The parentage of DNA can be marked with subscripts. For example, Stephan Windhoek's DNA can be written DNA-$6_2 4_1 4_2 6_1$XX (his mother is Parent1 and provides subscript-1; his father is Parent2).

CREATING SOPHONT OFFSPRING

When the appropriate number of sophont characters mate and generate a child, that child character randomly acquires the Gene of a characteristic from one of his parents.

Excluded Parents. A Neuter does not participate in the reproductive process and he is excluded from gene contribution.

Contributing Genes

Each eligible parent has the opportunity to contribute each Gene. Assign to each parent a number from 1 to 6 corresponding to the individual's gender. Roll 1D to determine the contributing parent; if the die roll does not correspond to a parent, reroll.

Some Genes are Gender-Linked. They are automatically transmitted to Same-Gender children; they are never transmitted to Different-Gender children.

Some Genes are Caste-Linked. They are automatically transmitted to Same-Caste children; they are never transmitted to Different-Caste children.

HOW MANY OFFSPRING?

The number of children produced by a sophont family can vary widely, and depends greatly on the number of genders the stability of the population, and the general and infant mortality rates.

HOW MANY OFFSPRING?

	Genders*					
Flux	1	2	3	4	5	6
-5	Child	Child	Child	Child	Child	Child
-4	Child	Child	Child	Child	Child	Child
-3	Child	Child	Child	Child	Child	Child
-2	Child	Child	Child	Child	Child	Child
-1	Child	Child	Child	Child	Child	Child
0	Child	Child	Child	Child	Child	Multiple
+1	Child	Child	Child	Child	Multiple	Multiple
+2	Child	Child	Child	Multiple	Multiple	Multiple
+3	Child	Child	Multiple	Multiple	Multiple	Multiple
+4	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple
+5	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple

* All Genders, not participating" Genders.

Multiple= 1D infants.

MUTATIONS

Genes can change due to mutations. Mutations can make Genes Dominant or Recessive, or increase or decrease their values.

Roll on the Mutations Table during UPP creation for each possible Gene. Thus, mutation may convert a parent's Gene from an existing Recessive to Standard and make it available for contribution (although it may not ultimately be selected).

Dominant applied to a Recessive makes it Standard. Recessive applied to a Dominant makes it Standard.

A Gene can be reduced to zero and represents a defective Gene or genetically transmitted disease. Genes can be increased above 6.

Other Effects: Dominant Genes are always selected over Standard or Recessive Genes. If more than one Dominant Gene is available from parents, one of the Dominants is selected randomly.

Recessive Genes are never selected if Standard or Dominant Genes are available. If only Recessive is available, one of those available is selected randomly.

Mutation Risk. Individuals subject to high levels of radiation or hazardous chemicals are considered High Risk and a have a greater chance of mutation.

High Risk individuals are those who have been exposed to situations which have a higher likelihood of inducing mutations. They include Engineers (because of long-term exposure to drive radiation), non-natives on worlds with tainted atmospheres, and non-natives on worlds with high energy stars (type O B A and F).

MUTATION TABLE

Flux	Standard	High Risk	Solitaire Gender
-5	- 1	- 2	Recessive
-4	- 1	- 2	- 1
-3	Recessive	- 1	- 1
-2		Recessive	
-1			
0			
+1			
+2		Dominant	
+3	Dominant	+1	+1
+4	+1	+1	+1
+5	+1	+2	Dominant

This table is used for each Gene when it is transmitted to an offspring.

Solitaire gender rolls on the Solitaire column in addition to the Standard or High Risk column.

GENEERING

Genes can be edited using a variety of medical techniques. Gene editing (Geneering) is one rationale behind Acquired Characteristic Increases in Character Generation.

For a variety of reasons (including game balance), edited genes are Recessive.

Character generation increases in characteristics which meet this criterion: an individual who receives genetic change in C1, C2, C3, C4, or Instinct has that Gene marked Recessive. That does not prevent such a Recessive from later becoming Standard or even Dominant through various mutations.

CLONING

A clone is an individual created using the Genes from one single parent. A clone is the same gender (and genetic Caste) as the parent.

Although a clone begins with the Genes of the one parent, it then rolls Generated D normally. Thus, several clones with the same Genes may exhibit a variety of final UPPs.

CROSS SPECIES INTERACTIONS

There is no common ancestor for all life in the universe. Life has evolved independently from the primordial soup on many, many worlds. Nevertheless, parallel evolution has produced life forms which are similar in biochemical and genetic structure.

There are, therefore, many different possible structures for genetic transmission of inherited characteristics. The human structure is DNA. Other conceivable structures involve alternate combinations of amino acids, triple helices, and even quadruple helices.

The Genetic Profile. The initial letters of the characteristics for a species create the Genetic Profile. The human Genetic Profile is SDEIES. There are 81 different possible combinations in the Profile, representing the 81 possible Genetic processes governing life forms.

Many others are also possible (envisioning even other details of Characteristics), but they are omitted from this

discussion.

Alien versus Similar. Two organisms or species which share the same Genetic Profile are **similar**. Two organisms or species which have different Genetic Profiles are **alien**.

Interspecies Fertility. Members of two distinct species are inter-fertile (and can create children) if they both have the same Genetic Profile and the same Nucleic Acid structure (ie, DNA, 4NA, etc). The result of interspecies fertility is **chimera**.

Interspecies fertility creates offspring which share some of the details of each species, including senses, body structure, and other elements. In the majority of cases, such offspring is non-viable. When it is viable, it is often sterile. When viable and non-sterile, it breeds true with other viable, non-sterile.

Bacterial or Microbial Infection. Disease bacteria (and other microbes) can infect a species if they both have the same Genetic Profile. The result is a disease for the victim organism. It follows that a species is immune to infection from a bacteria that does not share the same Genetic Profile.

Non-infectious disease can be caused by alien bacteria. The bacteria do not attack the victim organism, but its presence produces toxins which burden the victim.

Viral Infection. A virus can infect a species if they both (the virus and the species) have the same Genetic Profile. Virus with an alien Genetic Profile cannot infect an organism.

INHERITANCE OF C5

The Learning characteristics Education and Training are not inherited. Each is generated individually.

Instinct is an inherited characteristic.

INHERITANCE OF THE SOCIAL CHARACTERISTIC

The Social characteristics can be inherited, but they are transmitted socially rather than genetically.

Social Standing. The children of parents with Social Standing inherit a value one less than the highest Social Standing held by the parents. Upon the death of the higher (or highest) Social Standing parent, one child inherits that parent's Social Standing.

Charisma. Charisma is not inherited. Each child generates an individual Charisma.

Caste. Caste is not inherited. Each child generates Caste individually.

INHERITANCE OF MONEY

Children routinely inherit the assets of their parents when the parents die. The details of inheritance are prescribed by local culture, law, and the Referee.

THE GENETIC PROFILES

01 SAEIEC	10 SASIEC	19 SAVIEC	28 SDEIEC	37 SDSIEC	46 SDVIEC	55 SGEIEC	64 SGSIEC	73 SGVIEC
02 SAEIEK	11 SASIEK	20 SAVIEK	29 SDEIEK	38 SDSIEK	47 SDVIEK	56 SGEIEK	65 SGSIEK	74 SGVIEK
03 SAEIES	12 SASIES	21 SAVIES	**30 SDEIES**	39 SDSIES	48 SDVIES	57 SGEIES	66 SGSIES	75 SGVIES
04 SAEIIC	13 SASIIC	22 SAVIIC	31 SDEIIC	40 SDSIIC	49 SDVIIC	58 SGEIIC	67 SGSIIC	76 SGVIIC
05 SAEIIK	14 SASIIK	23 SAVIIK	32 SDEIIK	41 SDSIIK	50 SDVIIK	59 SGEIIK	68 SGSIIK	77 SGVIIK
06 SAEIIS	15 SASIIS	24 SAVIIS	33 SDEIIS	42 SDSIIS	51 SDVIIS	60 SGEIIS	69 SGSIIS	78 SGVIIS
07 SAEITC	16 SASITC	25 SAVITC	34 SDEITC	43 SDSITC	52 SDVITC	61 SGEITC	70 SGSITC	79 SGVITC
08 SAEITK	17 SASITK	26 SAVITK	35 SDEITK	44 SDSITK	53 SDVITK	62 SGEITK	71 SGSITK	80 SGVITK
09 SAEITS	18 SASITS	27 SAVITS	36 SDEITS	45 SDSITS	54 SDVITS	63 SGEITS	72 SGSITS	81 SGVITS

C1	C2	C3	C4	C5	C6	
S= Str	A= Agility	**E= Endurance**	**I= Intelligence**	**E= Education**	C= Charisma	**Bold** =
	D= Dexterity	S= Stamina		I= Instinct	K= Caste	Human.
	G= Grace	V= Vigor		T= Training	**S= Social Standing**	

GENDER SYMBOLS

Z*	X	C	V*	B	N	M*	<	>	?	
Solo	Gender Two	Gender Three	Gender Four	Gender Five	Gender Six	Gender Alt One	Gender Alt Two	Gender Alt Three	Strange	Gender Symbols
Female	Male	Neuter	Egg Donor	Activator	Bearer	Gender Alt Four	Gender Alt Five	Gender Alt Six	Bizarre	

Gender symbols are used when necessary. The symbols correspond the standard sophont genders FMN EAB 123456. Alt-123456 may be used when necessary. This font is T5-9000 Symbols.ttf. The upper row is CAPS; the lower row is lower case.

Genetics

The **Traveller** Genetic Data Card is used to record the genetic information for a character in support of reproduction, ancestry research, and cloning.

Genetics

GENETICS

Family Name | Racial Longname | Genetic Profile

	Individual Name	Gender	1FE	Individual Name	Gender	2MA
UPP Current	C1 C2 C3 C4 C5 C6			C1 C2 C3 C4 C5 C6		
UPP Genetic	C1 C2 C3 C4 C5 C6			C1 C2 C3 C4 C5 C6		
Dominance						

	Individual Name	Gender	3NB	Individual Name	Gender	4
UPP Current	C1 C2 C3 C4 C5 C6			C1 C2 C3 C4 C5 C6		
UPP Genetic	C1 C2 C3 C4 C5 C6			C1 C2 C3 C4 C5 C6		
Dominance						

	Individual Name	Gender	5	Individual Name	Gender	6
UPP Current	C1 C2 C3 C4 C5 C6			C1 C2 C3 C4 C5 C6		
UPP Genetic	C1 C2 C3 C4 C5 C6			C1 C2 C3 C4 C5 C6		
Dominance						

Card NN

SPECIAL GENE CODES

Code	Description	Explanation
+	Dominant	Dominant. selected before Standard.
[ ]	Blank	Standard. selected before Recessive.
-	Recessive	Recessive. selected if no other choice.
G	Gender-Linked	Automatically transmitted to same gender children; never transmitted to different gender children.
K	Caste-Linked	Automatically transmitted to same caste children.
X	Not Genetic	This characteristic is not genetic.

GENETIC CHARACTERISTICS

INHERITABILITY

	Genetic			Possibly	Non-Genetic	
C1	Str	-	-	-	-	-
C2	Dex	Gra	Agi	-	-	-
C3	End	Vig	Sta	-	-	-
C4	Int	-	-	-	-	-
C5	Ins	-	-	-	Edu	Tra
C6				Cas	Soc	Cha

MUTATION TABLE

Flux	Standard	Solitaire Gender	High Risk
- 6	- 2 Dominant	- 2 Dominant	- 6 Recessive
- 5	- 2 C-Linked	- 2 C-Linked	- 5 Recessive
- 4	- 1 G-Linked	- 1	- 4 Recessive
- 3	Recessive	- 1	- 3 Recessive
- 2	-	Recessive	- 2 Recessive
- 1	-	-	- 1
0	-	-	-
+1	-	-	-
+2	-	Dominant	-
+3	Dominant	+1	-
+4	+1 G-Linked	+1	+1
+5	+1 C-Linked	+2 C-Linked	+2 Dominant
+6	+2 Dominant	+2 Dominant	+3 Dominant

G-Linked. The Gene becomes Gender Linked.

C-Linked. The Gene becomes Caste Linked (ignore if the species has no Caste).

Recessive. The Gene becomes **Recessive** (if the Gene is currently Dominant, it becomes Standard).

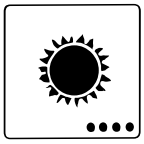
Dominant. The Gene becomes **Dominant**. If the Gene is currently Recessive, it becomes Standard).

+N. - N. The Gene value is increased or decreased.

This table is used for each Gene when it is transmitted to an offspring.

Solitaire gender rolls on the Solitaire column in addition to the Standard or High Risk column.

Tasks



Characters face obstacles and challenges… they face situations which must be resolved before their adventures can continue. Characters resolve these challenges using tasks: Success allows characters to continue their travels and to move on to the next situation. Failure requires that characters respond by re-trying, by attempting other tasks instead, or by abandoning their current efforts and going in a totally new direction.

Tasks dictate the success or failure of the characters' endeavors. They allow specific activities to be resolved consistently whenever they occur. It is the responsibility of the players behind the characters to analyze a variety of possible tasks and decide on the best course of action.

Many potential tasks can be skipped because their resolution would slow down the game without providing any additional drama. The referee determines which situations actually call for resolution and which can be assumed to be completed without difficulty or mishap.

The Synergy of Skill and Characteristic. The **Traveller** task resolution system considers together the character's personal aptitudes and individual skills. **Characteristic** represents a base of natural ability, **Skill** represents experience, learning, and practical knowledge. For example, different Characteristics interact with a Skill differently: Dexterity and Medical determine success as a surgeon; Education and Medical determine success in diagnosis. A high Dexterity and low Education character might still make a good surgeon; a low Dexterity and high Education character might make a good diagnostician; a high Dexterity and high Education character makes a good well-rounded (and probably more successful) Doctor.

Skills, Talents, and Knowledges. The terms Talent and Knowledge are special cases or variations of Skill.

The Purpose Of The Traveller Task System. The **Traveller** task system provides a means of resolving situations; the details of those situations in light of the tasks, skills, and characteristics become the basis for the story-telling aspects of **Traveller** adventures.

AN OVERVIEW OF TASKS

Tasks are important actions whose results have an effect on the characters and their endeavors. Tasks may be stated in the text of published adventures; they may be provided in the game rules; sometimes they may need to be defined by the referee.

Assets. Skills, Characteristics, and Modifiers used in a task are all Assets. Asset may refer to any of these specific terms, or to all of them collectively.

Creating Tasks. Knowing an activity, the referee determines the appropriate **Assets** to be considered. The referee also decides the difficulty of the task which determines the number of dice to be rolled.

To succeed, the player then must roll the Target Number (total of the Assets) or less on the dice dictated by difficulty.

Based on Skill and Characteristic. Tasks are resolved based on a specific skill and/or a specific characteristic.

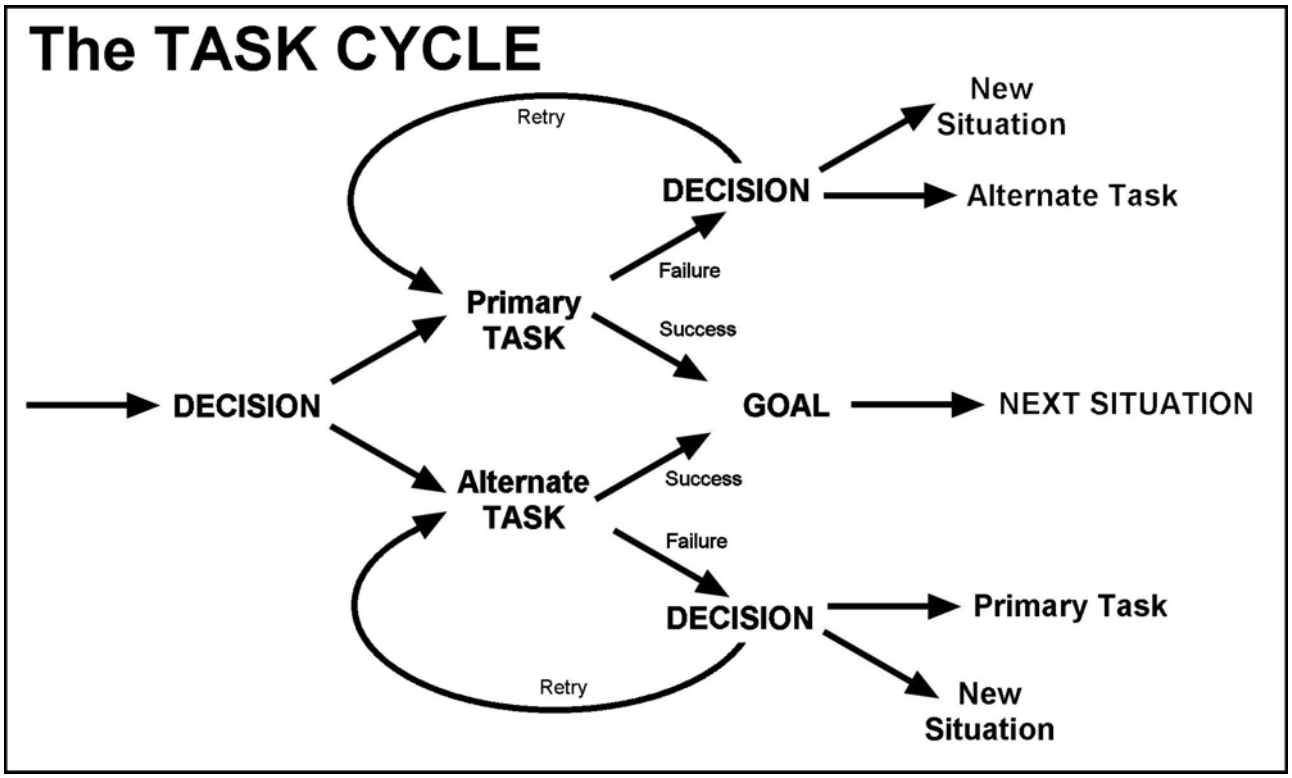
Duration. Duration may be included where the time element is important (such as deadlines or inexorable circumstances).

Special Results. Results of tasks may result in *spectacular failure* or *spectacular success* with correspondingly more powerful results.

Special Types: In addition to ordinary tasks, a variety of special tasks are also available, including:

- **cooperation** (two or more characters perform the task),
- **opposition** (two or more characters compete to resolve the same task),
- **tasks without skill** (based on characteristics and other factors),
- **tasks without characteristic** (based on skill and other factors),
- **tasks without skill or characteristic** (reflecting the use of the senses, or other common activities available to most individuals)
- **arcane tasks** (akin to tricks or special knowledge),
- **uncertainty** (the exact outcome of the task remains in doubt), and
- **tests and certifications** (reflecting academic or aptitude tests of proficiency).

Other Considerations. Tasks may reflect special circumstances such as divided attention or multi-tasking, and consequences.



The ultimate purpose of tasks is to determine if some goal is accomplished. If two different tasks will achieve the same goal, the preferred task is the one that is easier or more certain of success.

TASK FORMAT

Difficulty		Assets (Target Number)				
nD	**<**		**+**		**+**		**+**	
Die Roll		Char		Skill		Mods1		Mods2

Roll Low: The Task succeeds if the Die Roll is equal or less than the total of all Assets.

UNIVERSAL TASK FORMAT

Task Phrase:
To accomplish an important activity (duration).

Task Statement:

Difficulty (nD) <	Assets			
Difficulty (nD) <	Char			
Difficulty (nD) <	Char		+Mods1	+
Difficulty (nD) <	Char		+Mods1	+Mods2
Difficulty (nD) <		+Skill		
Difficulty (nD) <		+Skill	+Mods1	
Difficulty (nD) <		+Skill	+Mods1	+Mods2
Difficulty (nD) <	Char	+Skill		
Difficulty (nD) <	Char	+Skill	+Mods1	+
Difficulty (nD) <	Char	+Skill	+Mods1	+Mods2

Task Comments:
appropriate comments about the task.

TASK DIFFICULTIES

Difficulty Level		Dice
Eas	Easy	*
Eas	Easy (default skill-0)	1D
Ave	Average	2D
Dif	Difficult	3D
For	Formidable	4D
Sta	Staggering	5D
Hop	Hopeless	6D
Imp	Impossible	7D
Bey	Beyond Impossible	8D

Difficulty levels may be increased in **hasty** or decreased in **cautious** tasks.
* Usually automatic.

DEFINITIONS OF TERMS

The following terms are used in resolving tasks:

Assets. Skills, Characteristics, and Modifiers used in a task are all Assets. Asset may refer to any of these specific terms, or to all of them collectively.

Characteristic. The individual character's Characteristic most closely associated with the skill being used in the task.

Die Roll. Die roll is the result of the use of the dice. The number of dice used is dependent on the Difficulty.

Difficulty. The expression of how hard the task will be to complete.

Knowledge. A body of information based on a field of science or experience. A Knowledge is a variant form of Skill.

Mods. Modifiers. Modifiers are additions or subtractions reflecting local conditions. Modifiers may include weather, environment, distractions, and other elements.

Skill. The individual character's Skill being used to accomplish the task. The term Skill often includes Knowledges and Talents.

Talent. A personal ability not generally possible for a human, but possible for some non-humans. A Talent is a variant form of Skill. Talent is not used in the sense of fine art ability (such as a talent for music).

Target Number. The Target Number is the sum of all Assets used in the Task. The player must roll the Target Number (or less) on the dice in order to succeed.

Task Cycle. The process of evaluating which tasks to undertake.

THE UNIVERSAL TASK FORMAT

Tasks are expressed in a standard format (the Universal Task Format or UTF) containing the important elements of the specific situation. The UTF consists of a task phrase, a task statement, and any task comments. A typical task should be stated as with these three elements on three succeeding lines.

A typical task is

To do something [optional: time].
Difficulty (nD) < Assets
[comments]

Or, if translated into specific terms,

To repair a grav vehicle (1D hour).
Difficult (3D) < (Dex + Gravitics) + 1 for Tools (required)
Probably takes several hours.

The Task Phrase

The Task Phrase states the specific purpose of the task. It is stated as an infinitive verb phrase (i.e. "To" followed by a verb and any modifying words). It effectively states what the character wants to do.

If a task phrase requires more than one line, it is probably too complex and should be broken into two or more separate tasks.

The Task Phrase may contain Duration (in parentheses) and state the time the task generally takes to accomplish. This information is optional, and may often be ignored.

The Task Statement

The Task Statement shows the specific information which is required to resolve the task. Task resolution is based on a difficulty level, a skill and/or a characteristic, and modifiers.

The sum of the asset (the characteristic and skill and all applicable modifiers to the right of the <) is the **Target Number**. The player must roll equal to or less than the target number to succeed at the task.

Task Modifiers. Some situations may call for the incorporation of modifiers in the task resolution. Modifiers may be positive or negative numbers. Positive modifiers enhance the chances for successful completion of a task; negative modifiers reduce the chance of success.

Task Difficulties: The difficulty of a task indicates how many dice are rolled to resolve the situation. The greater the difficulty, the more dice are used to resolve it.

The Task Comments

The Task Comments include any supplementary information about the task. It states if the task is Cooperative, Uncertain, or Opposed. It states if the task is Hasty or Cautious. It includes any modifiers which did not fit in the Task Statement. It includes any additional information which may help in understanding the activity and its resolution.

RESOLVING TASKS

When a task becomes necessary, the referee tells the players its required skill and characteristic and its difficulty level. The players (those players whose characters are present in the specific situation) discuss who will attempt the task. The player behind the character selected identifies the skill and characteristic levels and determines the target number, and then personally rolls the dice and compares it with the target number. Low rolls are better. If the die roll result is equal to or less than the target number, the task is successful (conversely, if the die roll is greater than the target number, the task fails).

For example, Eneri Dinsha (777777 Communications-2) is on the world surface and trying to use a communicator to warn an approaching pinnace.

To establish communicator contact with a pinnace crew.
Average (2D) <(Edu + Communications) + Environ

It's an ordinary day; the Environ Mod is 0. The target number is (Edu + Comm = 7 + 2 =) 9, Eneri must roll 9 or less on 2D. He rolls 7, which means he succeeds in accomplishing the task.

Several days later, the same task comes up again. This time, the Referee rolls on the Comms Environ column of the Mods Table. He rolls -3 Equipment Glitch. The target number is (Edu + Comm + Environ = 7 + 2 -3 =) 6, which Eneri must roll or less on 2D. He rolls 7, which means he fails.

CHARACTERISTICS

One of the Assets for Tasks is Characteristics. Characters have characteristics as recorded in their UPP (Universal Personality Profile).

Humans have the six standard characteristics: Strength, Dexterity, Endurance, Intelligence, Education, and Social Standing. Sophonts (that is, non-humans) may have (but do not necessarily have) analog characteristics.

The Characteristics

	Non-Human	Human	Non-Human
C1		Strength	
C2	Agility	Dexterity	Grace
C3	Stamina	Endurance	Vigor
C4		Intelligence	
C5	Training	Education	Instinct
C6	Charisma	Social Standing	Caste

Characteristics on the same line are Analog Characteristics. They are similar in nature. For example, Agility, Grace, and Dexterity all reference similar abilities.

If a Task calls for a Characteristic which the user does not have, then the user can substitute the corresponding Analog Characteristic at half value. For example, a strange task commonly used by the Dranfians of Fogel-6 (who have Agility rather than Dexterity) may call for Agility. A human attempting the task can substitute Dexterity at half value (round fractions up).

SKILLS

One of the Assets for Tasks is Skills. Characters have skills representing their abilities in specific fields of endeavor. Each skill corresponds to approximately one year of education, training, or experience in that field.

Skills, Knowledges, and Talents. The general term **Skill** encompasses the more specific terms **Knowledge** and **Talent**.

A **Skill** is a broad familiarity or expertise in a specific field. Skills generally (but not always) correspond to a job title: the Skill called Astrogator refers to the expertise necessary to perform the job of Astrogator.

A **Knowledge** is an academic set of facts, or an area of specialization. Some Knowledges are subsets of a Skill (the Knowledge Pistol is a subset of the Skill Gun Combat); other Knowledges are stand-alone sciences (Archeology is a Knowledge).

A **Talent** is a skill which is generally only available to non-humans (and not necessarily to all non-humans). The Talent PhotoMem (having a photographic memory) is a skill which some sophonts can learn or have naturally. It is not a skill which most humans acquire.

Describing Skills

A skill is expressed as a skill name followed by a level. For example, Electronics-3 is level 3 of Electronics skill. The players and referee often express this skill level as Electronics-3 or Level-3 of Electronics.

Skills are very broad in their scope and should be broadly applied to tasks.

Default Skills. Generally, a task cannot be attempted if the character does not have the requisite skill. But all characters have Level-0 of a set of basic skills (the Default Skills).

There are times when characters need to accomplish tasks for which they do not have the required skill. Any character may attempt a task which specifies a Default Skill, even if the character himself does not have that skill. Skill level is 0 (zero) and the **This Is Hard! Rule** applies.

For example, Eneri Dinsha (777777 Pilot-2), while driving a groundcar, hits a patch of slippery road.

To avoid an accident
Average (2D) < Dex +Ground Craft

Eneri has no specific skill in Ground Craft, but it is a Default Skill. He can attempt the task with Dex 7 + Skill-0. The difficulty of the task is increased from Average to Difficult. He must roll 7 or less on 3D.

On the other hand, Eneri finds a bomb planted in the ground car. Explosives is not a Default Skill; Eneri cannot (or usually would not) even attempt to defuse it.

Compare two otherwise equal characters, one of whom has the required skill-2, and the other does not have the default skill, but can use it as skill-0. Both have characteristic-7. Skilled has C+S=9, and for an Average (2D) task has an 83% chance of success. Unskilled has C+S=7 and under the TIH! Rule must resolve an Average task as Difficult (3D); he has a 16% chance of success.

This is Hard! (TIH!)

If a task requires more dice than the character has applicable skill levels, then increase the difficulty one level. For example, a character with Skill-2 trying a Difficult task (3D) finds that “This Is Hard!!” Task difficulty increases one level to Formidable (4D).

Jack of All Trades can be used as a shield against the effects of the **This Is Hard! Rule.** If Skill plus JOT is equal to or greater than the number of dice being rolled on a task, then the TIH! rule does not apply. But, JOT does not directly increase the skill level used for task resolution.

The risk of Spectacular Failure is increased when using the TIH! Rule (see that section in these rules).

TASKS, SKILLS, AND CHARACERISTICS

Tasks use skills in a variety of ways.

Tasks Without Skill. There are some tasks where an appropriate skill does not exist. A phantom Skill (=3) is used as a placeholder for Skill. For example, lifting a large object depends primarily on Strength; there is no specific skill for lifting. In such cases, the task is expressed and resolved based on the characteristic alone.

To lift a large object into position.
Difficult (3D) < Str + 3
No skill involved.

There may be a problem or enigma which the characters must resolve in order to move forward. Once they have the clues or evidence necessary, there are times when the adventure is best played out with the character (rather than the player) solving the puzzle. For example, the player may be very smart, but the character may not be.

To puzzle out a problem (3 hours)
Staggering (4D) <Int + 3
Uncertain (2D)

Tasks With Skill Only. There are some tasks where the important consideration is skill alone; the influence of a characteristic being minimal. A phantom Characteristic (=7) is used as a placeholder for Characteristic. For example,

To convince a buyer that goods are acceptable.
Average (2D) < 7 + Broker

To convince a buyer that goods are acceptable.
Difficult (3D) < 7 + Broker +Quality
Quality (if not specified) = Flux

In each case, Intelligence or Education has a minimal effect: the quality of the goods speaks for itself; Broker merely allows the character to say the right words at the right time.

Tasks With Optional Skill. There are some tasks where the foundation is a characteristic, and while a skill could improve performance that skill is not necessary. The word Optional is used after the skill name.

To leap a 1.5 meter gap
Easy (1D) < Str + Athletics (optional)

To leap a 3.0 meter gap
Average (2D) < Str+ Athletics (optional)

To leap a 4.5 meter gap
Formidable (4D) < Str + Athletics (optional)

To leap a 6.0 meter gap
Staggering (5D) < Str + Athletics (optional)

A person could make a running broad jump and it is primarily based on Strength. Skill adds to the possibility of success (and to the distance jumped), but there is no penalty for not having the skill.

This particular type of task is in contrast to resolving a task with default skill.

A Task With Optional Skill omits the phantom Characteristic.

DURATION

Tasks take time.

Ignoring Duration

In many cases, the amount of time that a task takes is of no consequence and is ignored. The referee can decide that the task will take a reasonable amount of time, and that dealing with duration will only slow down the action.

Including Duration

When duration is important, the task should state how long it will take to attempt the task (even if it is unsuccessful).

Absolute Duration. If the duration of a task always takes the same length of time, it should state Absolute.

To take a standard aptitude assessment (2 hrs Absolute).
Staggering (4D) <Int +Edu
If successful, rank (on the test) is = task die roll.

Note that the lower the task roll, the better the rank on the test (assuming 1 is best).

Absolute duration passes whether the task succeeds or fails.

Variable Duration. Some durations cannot be accurately forecast. The task may have a duration of minutes, hours, or even days.

The standard times for variable duration are
10 minutes (plus or minus Flux minutes),
1 hour (plus or minus Flux times 10 minutes),
10 hours (plus or minus Flux hours),

Rarely is a single task duration more than 10 hours; if a longer time seems appropriate, break the task into components.

Variable duration is rolled even if the task failed.

For example,

To Replace A Flat Tire (Variable 10 minutes)
Average (2D) < Strength + Driver

The task may takes as little as (10 -5 =) 5 minutes or as long as (10 + 5 =) 15 minutes, but averages 10 minutes.

Randomized Duration. Some durations may vary randomly. If the circumstances dictate, divide Duration by 10 and multiply by 3D.

Hasty Tasks: Sometimes tasks need to be finished quickly. The player can specify **hasty**.

The time to complete the task is halved whether it succeeds or fails. In an opposed task, success completes the task before any non-Hasty opponents. The difficulty of the task is increased one level (Average becomes Difficult, etc.).

When an Uncertain task (detailed later in this chapter) is resolved as Hasty, the number of Uncertain dice is increased by +1).

Extra Hasty. Sometimes even hasty is not enough, and a truly hurried attempt is needed. A character may specify a task is **extra hasty**.

The time to complete the task is significantly shorter than normal. If successful, the task is completed before any others attempting tasks at the same time. In an opposed task, success completes the task before any non-Extra Hasty opponents.

The difficulty of the task is increased two levels (Average becomes Formidable, etc.).

When an Uncertain task (detailed later in this chapter) is resolved as Hasty, the number of Uncertain dice is increased by +2).

The Extra Hasty mechanic can be used in any time - sensitive situation (for example, roll two extra dice against FN in fighting situations).

Cautious: Sometimes, deliberate effort is more important than time. If the players feel that they need to accomplish a task more carefully than normal, they can specify task as **cautious**.

The time to complete the task is doubled. In an opposed task, success completes the task after any non-Cautious opponents).

The difficulty of the task is decreased one level (Difficult becomes Average, etc.).

Uncertainty (detailed later in this chapter) is unaffected by declaring a task Cautious.

A referee may allow a task to be declared **cautious** in order to decrease its difficulty.

A character can be Cautious up to one level of decreased difficulty (there is no Extra Cautious provision).

Cautious interacts with This Is Hard!

TIH! In some circumstances increases the Difficulty of a Task.

Cautious reduces the Difficulty of Tasks.

A player can (if time permits) declare a TIH! Task Cautious to compensate.

For example, Eneri Dinsha 777777 does not have Vacc Suit skill, and he needs to use a Vacc Suit to cross from one ship to another. Since Vacc Suit is a Default skill, he can use

it at Skill-0.

To put on and wear a vacc suit.
Average (2D) < Dex + Vacc Suit

Because the task requires more dice than Eneri has skill levels, he thinks to himself **This is Hard!** Its difficulty increases 1D to Difficult (3D).

Eneri needs to roll 7 or less on 3D. He does what any reasonably smart person would do in the situation. He takes his time, trying to remember that training film he saw long ago. So, he declares the Task Cautious, and takes twice as long to get ready. Difficulty reduces back to Average (2D).
Eneri needs to roll 7 or less on 2D.

Uncertain Hasty or Cautious Tasks. When an Uncertain task is resolved as Hasty or Extra Hasty, the number of Uncertain dice increases as the number of levels of difficulty increases.
When an Uncertain task is resolved as Cautious, the number of Uncertain dice does not change.

Restrictions. Some tasks cannot be sped up (or slowed down) and they should not be declared Hasty or Cautious tasks.

SPECIAL TYPES OF TASKS
Some tasks reflect special situations which require non-standard methods of resolution. These include Cooperative, Opposed, Uncertain, and Arcane tasks.
Cooperative Tasks. More than one character may actively cooperate in performing a single Cooperative task. Each individual cooperating contributes his (or her) skill level, while one character contributes the characteristic.
The Task Comment will say Cooperative (n Skill) indicating how many characters may participate (n equals the numbers of characters) and that the skill from each will be counted.
A Task Comment may instead say Cooperative (n Characteristic) indicating how many characters may participate (N equals the number of characters) and that the characteristic from each will be counted.
Typically cooperation can be used to sum Physical characteristics (three characters can pool their Strengths to lift an object that only one would not be able to), but not Mental (three characters with Int-9 cannot create a committee to solve a problem that requires Int-20) or Social Characteristics (three Barons Soc-C cannot take the place of the Emperor). If the task is successful, all participants succeed; if it fails, all participants fail.

To camouflage a vehicle from searching police.
Difficult (3D) < Int +Conceal
Cooperative (3 Conceal).

In this task, up to three participants may add their skill levels together in the resolution of this task. The character with the highest Skill (of those involved) contributes the associated characteristic.

To lift a large log off a vehicle
Difficult (3D) < Str
Cooperative (5 Str).

This task requires strength alone (no skill). Up to 5 characters can participate.

To write a musical (2D months)
Formidable (3D) <Int +Author + Music
Cooperative (2 Music +Author)

This task joins the diverse skills of two writers into a project to write a musical. Only the highest Characteristic is counted, but each counts all of his or her applicable skills.
When creating cooperative tasks, the referee should set the difficulty level as if only one individual is attempting the task. In the log-lifting example, the difficulty reflects one person trying; additional people help accomplish the task.
Note that the Referee can specify (based on circumstances) that “only the Highest Characteristic” or “only the Highest Skill” can be used.
Opposed Tasks. Characters in direct opposition may jointly participate in an Opposed task, with the result determining who succeeds (and who fails). Each participant rolls to resolve the task, with the lowest result succeeding.
The Task Comment will say Opposed (n) indicating how many characters may participate (n equals the numbers of characters). The lowest result is successful, provided that result is a success result; all other participants fail (regardless of the quality of their results).

To win a brawl.
Difficult (3D) < Str +Brawling
Opposed (up to 4). Resolves the brawl in one task.
All losers receive 2D hits. The winner is unscathed.

A more extended resolution of a brawl determines the loser of a specific round. The highest result (provided that result is unsuccessful) is the loser, receives 2D in damage, and is eliminated from the brawl. If no one is unsuccessful, repeat the task.

To resolve one round of a brawl.
Difficult (3D) < Str + Brawling
Opposed (up to 6). Resolves one round of the brawl.

Uncertain Tasks. There are tasks in which the results are uncertain. Uncertain tasks conceal their results from the players in a specific manner, and allow the players to make some deductions as to the task result.
An Uncertain Task Comment will say Uncertain (nD), when N is the number of dice the game master rolls. The remaining dice are rolled by the player. There may be instances where the die roll result is high enough for the player to understand that the task was successful, or is low enough to understand that the task was a failure. In some instances, however, the results will remain uncertain.
The game master and the players assume that the uncertain dice have a result of 3 each. If, based on the rolls by the player plus 3 for each Uncertain die, the result would produce success, then the game master announces that the task was successful; if the result would produce failure, then the game master announces failure. The game master secretly notes the actual results and administers them as necessary.

For example, Eneri Dinsha (777777, Stealth 5) has to get into the Regina fusion power plant in order to stop a terrorist plot.

To sneak past a guard into a fusion power plant.
Staggering (5D) < Int + Stealth
Uncertain (1D)

The player rolls 4D and the game master rolls 1D. Eneri needs to roll 12 or less on 5D. In the worst possible case, Eneri rolls 12 on 4D, and the uncertain roll is not required; Eneri is unsuccessful in his bluff. In the best possible case, Eneri rolls 6 or less on 4D, and even if the Uncertain die is 6, the task is successful.

However, if, based on Eneri's roll of 4D the result is still uncertain, the game master rolls the uncertain die and notes its result. The uncertain results are announced based on an assumed result of 3. Perhaps the guard accepted the fake ID and the bluff worked. Or perhaps the guard recognized the fake ID and accepted the bluff with a straight face, only to sound the alarm later? The game master knows what can happen, but the players remain uncertain as they walk forward deeper into the fusion powerplant.

When an Uncertain task is resolved as Hasty, the number of Uncertain dice increases as the number of levels of difficulty increases. For example, If an Average difficulty Uncertain (1D) task becomes Hasty, difficulty increases 1 level to Difficult (3D) and Uncertainty becomes 2D.

The Uncertain die roll is part of the total difficulty die roll. For an Uncertain (2D) Formidable (4D) task roll, the player rolls 2D and the game master rolls 2D.

When an Uncertain task is performed as Cautious, the number of Uncertain dice does not change.

Arcane Tasks. An Arcane task may be attempted only by the owner of the specific task. A character becomes an owner of the task and knows how to do it only after being awarded the task by the referee. Other characters with the same or similar level of skill do not necessarily know how to do this arcane task.

An Arcane task represents an ability (or a potential ability) to do a specific, special act not easily available to other characters. Arcane tasks are owned: they are acquired by a character and may only be attempted by the owner. They may not be sold, traded, or otherwise exchanged.

An Arcane task is a trick, a special procedure, or a process not generally available to other characters.

For example, jump drives of most starships spend a variable time in jump (generally between 150 and 185 hours). The Engineer on a Beowulf-class Free Trader may have acquired (at some time in her career) the Arcane task of tuning the jump drive to spend minimum time (150 hours) in jump.

To tune the jump drive to minimum time in jump (1 hour)
Difficult (3D) < Edu + Drives
Arcane.

The Arcane task still requires skill, and may still fail when attempted.

SPECIAL APPROACHES TO TASKS

Tasks may require special circumstances or preparation before being attempted.

Training, Practice, and Rehearsal. Preparation for a task through rehearsal (usually used with Performance), practice (used with Athletics), training (from an expert), or studying (cramming before a test or exercise) can be used as a die modifier. The modifier depends of the situation, but such modifiers range from 1 to 3.

To cram for a test
Difficult (3D) < (Skill + Characteristic)
Study materials required.
Success allows Good Flux Mod on Test

To practice for a task
(the same requirements as the true task)
Success produces Good Flux. If multiple practices are attempted, only the best Mod is used.

Tools and Equipment. Many tasks cannot be performed without tools or equipment. Tasks may specify specific tools or types of equipment required.

To surgically remove an appendix
Hopeless (6D) < (Dex + Medical)
Only household instruments available.

To surgically remove an appendix
Average (2D) < (Dex + Medical)
Surgical suite and equipment required.

Many tools are assumed in the course of describing the task… weapons, levers, screw drivers. Strange tools, or situations where tools may not be present should be addressed in the comments line.

SPECTACULAR RESULTS

Sometimes the results of a task are Spectacular: the outcome is more than "You succeed." Or "You fail." Spectacular may be positive or negative.

Spectacular Success achieves the goal of the task and provides some extra benefit beyond what was expected, and not necessarily directly connected to the task at issue.

Spectacular Failure not only fails to achieve the goal of the task, but produces some negative consequences (an injury to the characteristic being used; a cost in money, or to reputation; or damage to the tools or equipment being used). Spectacular Failure requires some long-term detrimental consequences to the Characteristic or the Skill used in the associated task.

A spectacular result implies three things:

1. An **element of chance** which goes beyond the normal description of a task. For example, a spectacular result to a task to repair a piece of equipment reflects that very small chance that the task will go very right (and something else is corrected as well) or very wrong (and a vital part is dropped down a drain).
2. The spectacular result reaches **beyond the narrowly focused task** itself. For example, when an automobile accident avoidance task succeeds, the accident is avoided; a spectacular success talks of narrow escapes, brilliant maneuvering, and heart-pounding effects on the participants.
3. The result is **independent of skill**. Even the most skilled of characters can experience spectacular failure and even the least skilled of characters can experience spectacular success.

Spectacular Success

A task result may be almost perfect. If the actual dice roll includes 3 ones (but not possible on 1D or 2D) the result is a **Spectacular Success** (even if the result would otherwise be a failure). The task succeeds. The task produces the results desired and positive consequences as well.

For example, Eneri Dinsha 777777 Computer-3 runs a

Difficult (3D) computer search and rolls a 3. The search not only succeeds, it spectacularly stumbles on the master system password.

Spectacular Failure

A task result may be terribly bad. If the actual dice roll includes 3 sixes (not possible on 1D or 2D), the result is a **Spectacular Failure**. The task fails to produce the results desired, and it produces negative consequences.

For example, Eneri Dinsha 777777 Computer-3 runs a Difficult (3D) computer search and rolls 18. The search not only fails, it spectacularly sets off security alarms. Even if Eneri's search was entirely innocent, he spends several hours explaining what he did.

Spectacular Failure Overrides Success. The die roll for a task may technically indicate success AND show spectacular failure. Even if a task succeeds, a Spectacular Failure makes the task fail.

For example, Ank Dinsha 777C77 Computer-6 runs a Difficult computer search and rolls 18. The task roll indicates success; the roll of 18 (= three sixes) creates Spectacular Failure. The task fails (spectacularly).

The success, however, should temper the consequences.

Spectacularly Interesting

It is possible (in a Hopeless or Impossible task) to roll both three 6's and three 1's. The result is a spectacularly interesting situation involving both Spectacular Success and Spectacular Failure (and a sign that the referee should make situation a rousing, interesting event for all concerned).

Spectacularly Stupid

If C+S is less than the number of dice being rolled, the task **cannot** be successful. Some characters will desperately try such a task in hope of Spectacular Success.

If a task is rolled in which C+S is less than the number of dice being rolled, the referee does not check for Spectacular Success, but does check for Spectacular Failure.

Spectaculars and Uncertainty

If an Uncertain task creates a spectacular visible result (3 ones or 3 sixes rolled by the player) Spectacular is imposed normally. If an Uncertain task creates a spectacular invisible result (some of the 3 ones or some of the 3 sixes rolled by the Referee), the Referee must secretly impose a Spectacular result.

For example, the crew of Imperial Close Escort Gazelle, limping away from a skirmish with the Zhodani, needs to jump to safety. With the glitches in the ship's computer, they have the coordinates for the Jump-4 but need to confirm them.

To manually confirm Jump-4 calculations
Staggering (5D) < Edu + Astrogator
Uncertain (1D).

The astrogator 777777 Astrogator-3 must roll 10 or less on 5D (of which the referee will roll 1D). In four parallel universes, the task is rolled:

Universe1. The Astrogator rolls 4D (= 1, 1, 5, 1) and the referee rolls 1D (= 3). The calculation is a visible Spectacular Success (which makes it succeed, even if the Uncertain die were a 6). The (character) Astrogator knows the results are right despite the uncertainty. As the jump is triggered, an enemy ship suddenly appears and is caught in the jump field: fragments of that ship contain important intelligence materials.

Universe2. The Astrogator rolls 4D (= 1, 1, 5, 6) and the referee rolls 1D (= 1). The calculation is an invisible Spectacular Success (the die rolls look like a failure; the Uncertain die makes it a Spectacular Success). The Astrogator has every reason to believe that the calculations do not confirm the jump coordinates, and he aborts the jump. They switch to passive mode to avoid detection and start to recalculate. The crew staffing scanners detects an enemy task force near the plotted jump point: it would have ambushed them as they triggered jump.

Universe3. The Astrogator rolls 4D (= 6, 6, 6, 1) and the referee rolls 1D (= 2). The calculation is a visible Spectacular Failure. The Astrogator knows the results are totally wrong despite matching with the computer output. They find that the ship's computer is fried and outputting total garbage.

Universe4. The Astrogator rolls 4D (= 6, 6, 5, 1) and the referee rolls 1D (= 6). The calculation is an invisible Spectacular Failure. The astrogator knows the results are wrong since the task failed. They begin the calculations from the beginning and only gradually discover that the ship's computer is outputting garbage.

SPECIAL CONSIDERATIONS

Several aspects of tasks necessitate special attention.

Jack of All Trades: One special skill confers on a character the ability attempt almost any task. A person with Jack of All Trades can use that skill in place of **any** other skill. The skill level used is two less than the level of Jack of all Trades skill held (but never less than 0). When Jack of All Trades is used with an effective level of 0, the process is the same as for a Default skill (that is, the **This Is Hard! Rule** Applies).

Jack of All Trades can also be used as a shield against the **This Is Hard! Rule.** If Skill plus JOT is equal to or greater than the number of dice being rolled on a task, then the TIH! rule does not apply. But, JOT does not directly increase the skill level used for task resolution.

Divided Attention: When a character attempts more than one task at once, the associated characteristic is halved. For example, a sniper aiming a weapon and giving orders would fire with half dexterity (the order giving task is Easy and probably succeeds anyway).

Distractions. Distractions are typically Modifiers on the Task Phrase.

Sometimes Easy Tasks Can Fail: When the sum of the skill level and the associated characteristic is less than 6, even an Easy task can fail. Rolling for resolution of the task reflects that even Easy tasks can fail for a character with very low skill and characteristic.

FRAGMENTARY TASKS

Some texts refer to tasks without fully specifying them, either because of space constraints, or to allow the game master greater flexibility. In such cases, the essentials of the task as shown in parentheses.

For example, a checklist may indicate a series of actions and include task details without completely specifying the tasks involved. For example, there might be an entry in a checklist like:

A. Encounter non-operating equipment.
B. Recognize that a problem exists.
C. Determine Cause of Problem
(Average < Mechanics + Strength, Uncertain).

In many tasks, the requirement to the left of the < is the sum of a skill and a characteristic (abbreviated C+S). For an Average (2D) task to succeed, the player must roll C+S or less on 2D; for a Difficult (3D) task to succeed, the player must roll C+S or less on 3D. The game master can create a task by simply specifying skill and characteristic and difficulty. For example,

"The polarizer is malfunctioning. Use Electronics and Dexterity for a Difficult task."

The players discuss among themselves who is best suited for this task, and that individual attempts it.

CREATING TASKS

The referee in **Traveller** is often called upon to create tasks as situations arise. The process for creating tasks is simple and straightforward.

1. Express the Task Phrase. State specifically and clearly the action that the players want to perform. The phrase should be no more than one line, and should encompass one specific action.

If time is important, the time required to attempt the task should be stated. This may be no time at all, or may be irrelevant (in which case, time is ignored), or it may range from 10 minutes to several hours. Typically, one task will take no more than a day.

2. Express the Task Statement. Determine the skill required to perform the task, and state the characteristic associated with that skill in this form: (characteristic + skill).

Determine any modifiers which may apply to the task (such as darkness, weather, computer model). Positive modifiers increase the chances of success; negative numbers decrease the chance of success. It is possible for both positive and negative modifiers to be stated. If a significant number of modifiers are to be stated, shift them to the Task Comments.

Determine the difficulty level of the task. Using the Task Difficulty Table, state the difficulty level of the task. Be sure to include the number of dice to be thrown in parentheses.

3. Express The Task Comments. Indicate if the task is Cooperative, Opposed, or Uncertain. Indicate if the task is an Action. Indicate any additional modifiers which did not fit on the Task Statement line.

Deciding On Difficulty Levels (Benchmarks)

The referee, when creating tasks, needs to determine the difficulty level for a specific task based on a variety of circumstances.

Using the following guidelines, a referee can set the difficulty at or somewhat below the levels shown:

A reasonable characteristic is in the range: 6-7-8-9.

Usually is defined as more than half of the attempts.

An **unskilled** individual (using a skill-0) with reasonable characteristics should be able to usually complete an Easy task. C+S=7. The TIH! Rule increases Difficulty to Average (2D).

A **novice** (skill-1 or so) with reasonable characteristics should be able to usually complete an Average task. C+S=8

A **competent professional** (skill-3 or so) with reasonable characteristics should be able to complete a Difficult task. C+S=11

An **experienced expert** (skill-6 or so) with reasonable characteristics should be able to usually complete a Formidable task if he pays attention and is careful in his work. C+S=13.

An **extremely skilled master** (skill-9 or so) with reasonable characteristics should be able to usually complete a Staggering task, and occasionally to attempt the Impossible and succeed. C+S=18

Difficulty Benchmarks

Level	C+S	Difficulty	Success
Unskilled	7	Easy*	58%
Novice	8	Average	72%
Competent	11	Difficult	63%
Experienced	13	Formidable**	84%
Master	18	Staggering	60%
Master	18	Impossible	9%

*increased to Average; uses TIH!

** if Cautious.

Tests and Certificates

Characters can document their abilities by taking tests or obtaining certifications.

Tests. Characters can take tests of their skills (and knowledges, and talents). Passing the proper test allows the character to record an appropriate level of ability.

Any specific test is constructed by and administered by the referee in a role-playing situation. While all tests are generally similar in structure, the specific details of the text are stated by the referee.

A test is not a task. It is instead an evaluation of the probable results of tasks the character may undertake.

In administering a test, the referee states the skill (or knowledge or talent) the applicable characteristic, and the difficulty of the test. While this characteristic is typically related to the skill, it need not be. The character then states his current skill level and characteristic and any applicable mods; the total assets are then compared to the C+S table to determine the percentage chance this value has of success.

Acceptable mods include Hasty or Cautious, cramming, study, and rehearsal.

Certificates. The difficulty of the test determines the certification the test provides:

A **Qualified** individual has met the minimum requirements of a skill. He must show the ability to succeed at an Easy task. When a job or vocation states a skill-related job title, a character must generally be Qualified in order to be hired.

A **Competent** individual is qualified to perform many tasks within a skill. He must show the ability to succeed at a Difficult task.

An **Experienced** individual is qualified to perform most tasks within a skill. He must show the ability to succeed at a Formidable task

A **Master** individual is qualified to perform virtually all tasks within a skill. He must show the ability to succeed at a Staggering task.

Record Certifications with the name of the skill and the proper label (for example, Astrogator- Qualified).

Percentages and The Real World. Characters need a chance of success. **Traveller** is a game and it is intended for entertainment. If players and characters are specifically frustrated in their adventures because of "realistic" percentages, then the situations (and the game) become frustrating rather than entertaining and adventuresome.

That is not to say that characters should always succeed; the challenge of failure is also a source of motivation… to seek out alternatives to the present course of action, or to try again with renewed energy.

WORKING WITH TASKS

When working with tasks, remember the following points:

Don't Overdo Pre-defined Tasks. Published tasks define the levels of difficulty when resolving adventures. If there is no pre-defined task available, it is the responsibility of the referee to create an appropriate task or set of tasks.

The Role Of The Referee: The referee retains (and must always be aware of) a responsibility to administer the task system in a way that produces realistic resolutions. The referee can impose results and modifiers, bring in or apply other skills or characteristics, or change difficulty levels in order to make the resolution of tasks more realistic.

AN UNDERSTANDING OF TASKS

A task rationally considers the probability that a character can successfully undertake some action. That probability depends on a skill and its associated characteristic.

The **base number** is the characteristic; the added skill achieves two objectives: it allows the task to be undertaken, and it raises the percentage chance that the task will be successful.

For example, the interaction of skill and characteristic in a Difficult (3D) task which requires Skill with an associated characteristic of Dexterity.

To manipulate a component into position.
Difficult (3D) < Dex + Mechanical

Dexterity-7 implies a base chance of 29% of accomplishing the task; but untrained, uneducated, inexperienced Dexterity alone is not enough: Skill is required. Skill-1 increases the chance of accomplishing the task to 43%. Skill-2 increases that chance to 57%. Skill-5 increases that chance to 82%.

Dexterity-9 and Skill-3 produces the same chance of success as Dexterity-7 and Skill-5. Native dexterity makes up for a lower level of skill. On the other hand, Dexterity-3 and Skill 9 also has the same chance of success as Dexterity-7 and Skill-5. Skill makes up for a lower level of Dexterity.

Using A Default Skill. The skill involved may be a default skill. Dexterity-7 implies a base chance of success of 29%. If the character has no skill and must resolve based on a default skill, the difficulty is increased one level (based on the **This Is Hard!** Rule), making the base chance of success 3%. The character has some small chance of succeeding. A smart player can make the task Cautious, reducing difficulty to Formidable (4D) and the chance of succeeding increases to 16%.

The Skill Eligibility Benchmark. Although skills can be received in a variety of ways, one level of skill represents roughly one year of training or experience. A person with Skill-1 has received about one year of exposure to and use of the skill. A person with Skill-8 has about eight years of such exposure. How much has actually been learned or is usable depends on the specific situation, the task being resolved, and on the associated characteristic.

Knowledges. Individuals may have applicable Knowledge in addition to Skill. Where applicable (and allowed by the Referee), Knowledge may be a usable mod in a Task.

Aptitudes (Using The C+S Chart). Judging a character based strictly on skill level can be misleading. Instead, characters can be evaluated based on aptitudes: the probability that a character can accomplish a task. To determine a character's aptitude add the associated characteristic and the skill level (producing C+S) and consult the proper column for task difficulty on the Chance of Task Success Table. The reading is the percentage chance of success the character has in this specific task.

WHEN TASKS FAIL

The ultimate purpose of tasks is to determine if characters can be successful in accomplishing activities that they believe are necessary to their plans. When tasks fail, or when they fail repeatedly, the characters (and the players behind them) must search in role-playing fashion for tasks at which they can succeed.

ACTIONS

Task-like activities which do not depend on skills or characteristics are Actions. An action is expressed like a task, but the Task Statement is more free form. It indicates the information which will be compared against the difficulty level.

The Sense Actions

Sense actions (Vision, Hearing, Smell) evaluate circumstances to determine if a specific sense, in a specific situation, succeed in seeing or hearing (or otherwise) some object.

The Senses are resolved as Actions. Two types of Action are possible: At Range, and In Contact.

At Range. When senses operate at a distance (Vision, Hearing, Awareness, Perception), the Action takes account of Range by using D6 equal to the range number (Vshort=1, Short =2, etc and a range table is provided).

In Contact. When senses operate in contact (Touch, Smell), range is ignored and the Action is based on 2D.

Immediate Action

Immediate Action is the trained automatic response to a problem, without regard to diagnosis or probable cause.

Soldiers, mechanics, technicians, and clerks all respond to an equipment malfunction by performing Immediate Action.

When a weapon, device or component fails or malfunctions, identify the appropriate skill and

Check Skill (2D)

Success makes the severity of the malfunction or damage Easy 1D and the device remains operable.

A result of 12 is automatic failure.

The Aging Action

Characters age as time passes. Aging is consulted at the beginning of each Term once aging begins.

Aging is resolved with the Aging Action.

To Age
Average (2D) < Life Stage

Success inflicts the effects of age on the character.

A character wants to FAIL this action.

For example, at Life Stage 5, a character rolls for each of the physical characteristics: If the result is 5 or less on 2D, the characteristic is reduced by -1 (in this case, failure to age is a benefit for the character).

THREE, SEVEN, AND ELEVEN LEARN EXPLOSIVES

Consider three characters: Three (with low Dex 3); Seven (with an average Dex 7), and Eleven (with high Dex 11). Each character is otherwise average and has a UPP 7X7777 (X = Dexterity).

Dexterity (Dex) is a measure of a character's fine-manipulation ability: someone with Dexterity 2 is very clumsy; someone with Dexterity 12 is very adroit. The characteristic expresses a character's aptitude or potential to perform tasks which require Dexterity: someone with a high Dexterity is much more likely to succeed when attempting a task which requires Dexterity.

Explosives governs the use of explosive and demolition devices; it is often associated with Dexterity. When a character contemplates career skills, a low dexterity character might rightly decide to avoid learning that skill.

Explosives is not a Default skill.

Three Characters Learn Explosives

Three, Seven, and Eleven all consider learning Explosives. Eleven has the best aptitude for the skill, but because Explosives is not a Default skill, without training he is unable to safely interact with explosives; Three has the worst aptitude. All three are selected to attend a class on explosives; all three successfully complete the training, and all three receive Explosives-1.

They begin their work activities with Explosives.

An Easy Explosives Task

To disarm a simple device.
Easy (1D) <Dex + Explosives

Each character must roll equal to or less than Dex + Explosives on 1D. When Eleven tries the Easy task, he automatically succeeds (Dex 11 plus Explosives-1 = 12, and the worst roll possible on 1D is only 6). When Seven tries the Easy task, she automatically succeeds (Dex 7 plus Explosives-1 = 8, and the worst roll possible on 1D is only 6). Three is at a disadvantage: his low Dexterity 3 plus Explosives-1 = 4 means that even on this Easy task, he has a 33% chance of failure.

An Average Explosives Task

To disarm a complex device.
Average (2D) < Dex + Explosives

Each character must roll equal to or less than Dex + Explosives on 2D. They each must say "This Is Hard!" and the difficulty of the task increases one level to Difficult (3D). Eleven tries this now-Difficult task (Dex 11 plus Explosives-1 = 12) and succeeds 74% of the time. Seven tries this now-Difficult task (Dex 7 plus Explosives-1 = 8) and succeeds 26% of the time. Three knows (or should know) better than to try this now-Difficult task (his low Dexterity 3 plus Explosives-1 = 4 means that on 3D, he has only a 2% chance of success).

A Difficult Explosives Task

To disarm a booby-trapped device.
Difficult (3D) < Dex + Explosives

Each character must roll equal to or less than Dex + Explosives on 3D. Because all three characters have Explosives-1 and the task requires 3D, they each say "This Is Hard!" and the difficulty of the task increases one level to Formidable (4D). When Eleven tries this now Formidable task (4D), he succeeds 34% of the time (Dex 11 plus Explosives-1 = 12). When Seven tries this now Formidable task, she succeeds 5% of the time (Dex 7 plus Explosives-1 = 8). Actually, Seven uses common sense and she makes the task Cautious, decreasing difficulty one level to Difficult (3D); she succeeds 26% of the time. Three knows better (or should know better) than to try this now Formidable task (his low Dexterity 3 plus Explosives-1 = 4 means that he has a less than 1% chance of success). Spectacular Failure happens if the roll is three 6's. Each of these characters has about a 1% chance of Spectacular Failure; and about a 1% chance of Spectacular Success regardless of skill.

More Explosives Training. Three may decide that regardless of his aptitude, he wants to be a Explosives Expert and he pursues nine years of study and practice and eventually reaches the same level of achievement as Eleven (since Dex 3+ Explosives-9 is the same as Dex 11 and Explosives-1 when we consider the bomb defusing aspect of Explosives as a Dexterity-based activity). Moreover, Three no longer faces the **This Is Hard! Rule**, and is actually better than Eleven at Difficult or higher tasks.

If Eleven made no improvements in his skill, and Three made these major improvements, then Three would certainly be more of an expert, with more knowledge, theoretical experience, and even practical experience.

Eleven (C+S=12) and Three (C+S=12) are equally proficient at Easy tasks (with 100% chance of success). Then their abilities start to diverge.

On an Average (2D) task, Three has a 100% chance of success (and Eleven treats it as Difficult (3D) with 74% chance of success).

On a Difficult (3D) task, Three has a 91% chance of success (and Eleven treats it as Formidable (4D) with 34% chance of success).

On a Formidable (4D) task, Three has a 74% chance of success (and Eleven treats it as Staggering (5D) with 10% chance of success).

On a Hopeless (6D) task, Three has a 10% chance of success (and Eleven treats it as Impossible (7D) with a less than 1% Chance of success).

Finally, on an Impossible (7D) task, Three has a 2% chance of success (and Eleven treats it as Beyond Impossible (8D) with a less than 1% Chance of success).

Using Other Characteristics With Explosives. Other characteristics can be used with a skill. Three might be a clumsy genius (735AC9). With his Explosives-1 skill, he would still be well-suited to the following tasks.

To identify a booby-trapped package:
Average (2D) < Int + Explosives

To recognize the characteristics of the explosive used:
Difficult (3D) < Edu + Explosives

Three can still be a useful character on a Explosives Team… but the teammates know they should not let him actually touch the bombs. When partnered with Eleven (a bit of a dunce at 7B7536), they make a good team with Three telling Eleven what wires to cut.

THREE, SEVEN, AND ELEVEN AS FIGHTER PILOTS

Consider three characters: Three (with low Dex 3); Seven (with an average Dex 7), and Eleven (with high Dex 11). Each character is otherwise average and has a UPP 7X7777 (where X is Dexterity). The occasional opponent is an average UPP 777777 with Small Craft-3.

Three, Seven, and Eleven after they have received training in deep space fighters (the skill is Small Craft). Eleven has the best aptitude; Three has the worst. All three ultimately receive Small Craft-3.

They set out on a routine mission with their deep space fighters: Preflight. Launch. Transit. Maneuver. Encounter. Dogfight. Mission Profile. Return. Landing.

Preflight Tasks

To perform a preflight check on a deep space fighter.
Easy (1D) < Edu + Small Craft

All three have Edu 7. Edu-7 + Small Craft-3 = 10). Using one die, success is guaranteed. An unskilled individual can't attempt this task because Small Craft is not a default skill).

Launch Tasks.

To launch/take-off a deep space fighter.
Average (2D) < Dex + Small Craft

Eleven tries this Average task; he automatically succeeds (Dex 11 plus Small Craft-3 = 14; the worst roll possible on 2D is still 12). Seven tries this Average task, she succeeds 92% of the time and fails 8% of the time (Dex 7 plus Small Craft-3 = 10, and the possible rolls extend up to 12). Three knows better than to try this Average task (his low Dexterity 3 plus Small Craft-3 = 6 means that on this Average task, he has an 42% chance of failure). Three has gotten this far because he is cautious. He declares this task Cautious which shifts it to Easy and he succeeds.

Transit/Travel Tasks

To travel to a destination in a deep space fighter.
Easy (1D) < Dex +Small Craft

All three individuals have Edu 7, which in conjunction with Small Craft-3 requires a roll of 10 or less. Using one die, success is guaranteed.

Maneuver Tasks

To maneuver against an opponent in a space fighter.
Average (2D) < Dex +Small Craft
Opposed (2). Success provides Advantage-3 in Dogfight.

Success in this task depends on the skill of the opposing deep space fighter. Eleven is more likely to succeed than Seven, who is more likely to succeed than Three. Success gives an advantage in the ensuing dogfight.

Three begins maneuvering (Dex-3 + Small Craft -3 = 6; he rolls 7 and fails. His opponent with Dex-7 + Small Craft-3 = 10 rolls 7 and succeeds). The opponent receives Advantaage-3 in the upcoming dogfight. Seven begins maneuvering (Dex-7 + Small Craft-3 = 10; he rolls 7 and succeeds. His opponent with Dex-7 + Small Craft-3 = 10 rolls 7 and succeeds). Neither pilot has the lowest roll; neither receives an advantage. Eleven begins maneuvering (Dex-11 + Small Craft -3 = 14; he rolls 7 and succeeds. His opponent with Dex-7 + Small Craft-3 = 10 rolls 7 and succeeds). Neither pilot has the lowest roll; neither receives an advantage.

Dogfight Tasks

To dogfight an opposing deep space fighter
Average (2D) < Dex +Small Craft + Advantage
Opposed (2). Success allows an attack by the fighter.

Three begins the dogfight (Dex-3 + Small Craft -3 = 6; he rolls 7 and fails. His opponent (Dex-7 + Small Craft-3 + Advantage-3 = 13 rolls 7) succeeds. The opponent can make an attack on Three. Seven begins the dogfight (Dex-7 + Small Craft-3 = 10; he rolls 7) and succeeds. His opponent (Dex-7 + Small Craft-3 = 10 rolls 7) succeeds). Neither pilot has the lowest roll; neither achieves attack position. Eleven begins the dogfight; because of his Dexterity, he elects Hasty. The task becomes Difficult (Dex-11 + Small Craft -3 = 14; he rolls 11 on 3D and succeeds. His opponent with Dex-7 + Small Craft-3 = 10 rolls 7 and succeeds). Eleven was Hasty and the opponent was not; Eleven may attack the opponent (and opponent may attack Eleven) BUT, if Eleven's attack succeeds, then opponent may not attack.

Mission Profile/ Attack Tasks

To attack a target with a deep space fighter
Average (2D) < Dex +Small Craft
A successful attack drives off the defender.

Three's maneuvering has not put him into a position to attack. He aborts the mission and begins his return (thus depriving his opponent of an opportunity to attack him). Neither Seven nor her opponent are in a position to attack. They continue to maneuver against each other. Eleven is in a position to attack (Dex 11 plus Small Craft-3 = 14; he rolls 7 and drives off the opponent).

Other Activities

Seven and Eleven are still in position to maneuver and attack. Eleven has driven off his opponent and can shift to a new opponent. Three has started back to base.

Landing Tasks

To return to base with a deep space fighter.
Average (2D) < Dex +Small Craft

Three wants to make sure he succeeds. He declares his return Cautious (and thus Easy) and automatically succeeds (Dex-3 and Small Craft-3 = 6). Seven does the same and automatically succeeds (Dex-7 and Small Craft-3 = 10). Eleven is cocky and with good reason; he resolves the task as Average and automatically succeeds (Dex 11 plus Small Craft-3 = 14, and the worst roll possible on 2D is still 12). He returns to base first.

It should be apparent that only highly skilled individuals should be deep space fighter pilots. The others are better suited to support or administrative tasks, or to missions which have substantial additional training or rehearsal.

Master Skills List

This list is the authoritative reference for skills, knowledges, and talents.

Skills

SKILLS, KNOWLEDGES, AND TALENTS

A **skill** is (generally) a statement of ability based on a job or vocation. For example, Astrogator reflects what an Astrogator knows about doing his job. A **knowledge** is (generally) a body of information based on a field of science or experience. For example, Chemistry reflects the body of knowledge of theoretical and practical chemistry. A **talent** is a personal ability not generally possible for a human, but which may be possible for some specific non-humans. For example, SoundMimic (the ability to exactly reproduce sounds). A personal reflects a strategy or process within the Personals interaction system.

Benchmarks. One level of a skill or knowledge or talent typically represents one year of experience, education, or training. An individual with Skill-4 has four years of experience in that skill; a person with Knowledge-3 has the equivalent of three years of instruction or practical experience with that field of knowledge.

64 SKILLS

The Skills (35)

- Admin
- Advocate
- Animals
- Athlete
- Broker
- Bureaucrat
- Comms
- Computer
- Counsellor
- Designer
- Diplomat
- Driver
- Explosives
- Fleet Tactics
- Flyer
- Forensics
- Gambler
- High-G
- Hostile Environ
- JOT
- Language
- Leader
- Liaison
- Naval Architect
- Seafarer
- Stealth
- Strategy
- Streetwise
- Survey
- Survival
- Tactics
- Teacher
- Trader
- Vacc Suit
- Zero-G

Starship Skills (7)

- Astrogator
- Engineer
- Gunner
- Medic
- Pilot
- Sensors
- Steward

The Trades (10)

- Biologics
- Craftsman
- Electronics
- Fluidics
- Gravitics
- Magnetics
- Mechanic
- Photonics
- Polymers
- Programmer

The Arts (6)

- Actor
- Artist
- Author
- Chef
- Dancer
- Musician

Soldier Skills (6)

- Fighter
- Forward Obs
- Heavy Wpns
- Navigator
- Recon
- Sapper

Defaults, Talents, and Personals

Default Skills

- Actor
- Artist
- Athlete
- Author
- Comms
- Computer
- Driver
- Fighter
- Turrets
- Mechanic
- Steward
- Vacc Suit

Talents (16)

- Compute
- Empath
- Hibernate
- Hypno
- Intuition
- Math
- MemAware
- Memorize
- MemPercep
- MemScent
- MemSight
- MemSound
- Morph
- Rage
- SoundMimic

Personals (7)

- Carouse
- Query
- Persuade
- Command
- Curiosity
- Insight
- Luck

MANY KNOWLEDGES

Animals
- Rider
- Teamster
- Trainer

Driver
- ACV
- Automotive
- Grav
- Legged
- Mole
- Tracked
- Wheeled

Engineer
- Jump Drives
- Life Support
- Maneuver Drives
- Power Plants

Fighter
- Battle Dress
- Beams
- Blades
- Exotics
- Slug Throwers
- Sprays
- Unarmed

Flyer
- Aeronautics
- Flapper
- Grav
- LTA
- Rotor
- Wing

Gunner
- Bay Weapons
- Ortillery
- Screens
- Spines
- Turrets

Heavy Weapons
- Artillery
- Launcher
- Ordnance
- WMD

Pilot
- Small Craft
- Spacecraft ACS
- Spacecraft BCS

Seafarer
- Aquanautics
- Grav
- Boat
- Ship
- Sub

The Sciences
- Archeology
- Biology
- Chemistry
- History
- Linguistics
- Philosophy
- Physics
- Planetology
- Psionicology
- Psychohistory
- Psychology
- Robotics
- Sophontology

Specialized
- Career: Academia
- Career: Army
- Career: Navy
- Career: <Name>
- World: Capital
- World: Regina
- World: <Name>
- [others are possible]

The list of Skills is exhaustive; no other skills are available. The list of Personals is exhaustive; no other skills are available. The lists of Knowledges and Talents are advisory; many different and additional Knowledges and Talents are possible.

Skills Define Abilities

Skills are quantifications of each individual character's abilities. Skill is a broad label which is further divided into Skills, Knowledges, and Talents. Each has its own usages and restrictions.

Skills are areas of expertise. A character who has a skill is capable of acting within that area. For example, someone with Medic can reasonably be expected to attempt (and sometimes or often succeed) in medical situations. In the general role-playing sense, characters often do things that do not involve tasks but do involve skills. For example, a starship owner will probably not hire an astrogator who does not have Astrogator. There is no task involved, but having the specific skill is nevertheless important.

Skills are Assets in the Resolution of Tasks. A character with a specific skill can attempt tasks that someone without skill is not even permitted to try.

IN THIS CHAPTER

The skills that characters may learn are covered in this chapter alphabetically. Each entry shows the skill name. If the skill is a cluster or cascade skill, that notation is made.

The Skill List. The Skill List presents all available skills in one chart.

Task Examples. Because skills are intimately bound up in tasks, many of the entries in this chapter include examples of tasks using the skills. These examples are not exhaustive… they are shown as guides to proper usage and to encourage the creation of similar tasks for specific situations.

SKILLS

Skills are the primary means by which characters do things in **Traveller**. Each character has a variety of skills, and the higher a skill rating, the more expert the character is with that skill. With training, any character can eventually become proficient at any skill.

Benchmarks. One level of a skill theoretically represents one year of experience, education, or training in that skill. An individual with Skill-4 has four years of education, training, or experience in that skill. In general, a character receives one level of one skill in each year of his or her life.

Skill Format. Each skill is usually a one or two word name (alas, Jack of All Trades is a four word name; it is abbreviated to JOT). Skills are always capitalized (for example, Pilot). Skills are numerically rated by levels from 1 (or sometimes 0) to 9 or more. Any skill attached to a character should show that character's numerical level as well as the name (for example, Pilot-4).

Recording Skills. For simplicity and completeness, all skills (other than the universal Default skills) are recorded on the individual's character record.

Default Skills

There are some situations that an unskilled character will not try: disarming bombs; flying high performance aircraft. And there are some things that unskilled characters may decide to try: painting a picture; shooting a gun.

Default skills represent this base of activity that even an untrained person may be willing to attempt.

A skill identified as a **default** skill may be used by any character. The skill level used is 0 (zero); other penalties also apply when resolving a task using a default skill. But, the chance of success is still better than if the task were not attempted at all.

Default skills are sometimes called Level-0 Skills.

The standardized Default Skills are automatically available to all characters.

Unique Default Skills. In addition to the standardized and widely available Default skills, every character may have a personal area of interest (perhaps a hobby).

An individual who does not already have a hobby (available to Citizens and Functionaries) can, after Career Resolution but before beginning adventuring, designate one skill as a Hobby. It becomes a Default skill-0.

A Hobby cannot be an existing default skill or a skill already held by the character.

Training, Ability, and Technology Level

Individuals come from a variety of technological backgrounds in the **Traveller** universe. The abilities conferred by skills are relatively tech level independent. That is to say, an individual with an appropriate skill is experienced in the repair and maintenance of specific devices, and he understands the basic principles of the devices. When he encounters a device at a higher (or lower) tech level, he probably can puzzle out its use, maintenance and repair, especially if the appropriate manuals or technical supplies are available.

For example, Rollan Burris is native to a TL-6 environment and has Ground Craft-4. Much of his experience is with TL-6 Ground Vehicles. Later in his life, he gets a job fixing cars… and he is equally competent fixing TL-4, TL-6, and TL-9 ground cars. He has access to diagnostic equipment, repair manuals, tools, and parts. Faced with an instrument malfunction on the ground car, he might repair the instrument itself on the TL-4 vehicle. On the TL-6 vehicle, he could replace the instrument. On the TL-9 vehicle, the manuals would tell him the appropriate diagnostic codes which would self-repair the instrument. The value in hi skill, independent of tech level, lies in his ability to diagnose the problem and implement the solution.

Weapons Skills

A variety of weapon skills are included in this chapter. The information presented here deals primarily with the skills in areas other than combat.

The details of personal combat are covered in **Fighting**.

The details of space combat are covered in **Space Combat**.

Knowledge is the Foundation of Skill

Some skills include within them several Knowledges (Animals, Driver, Engineer, Fighter, Flyer, Gunner, Heavy Weapons, Language, Pilot, Seafarer).

Acquisition of these skills (except Language as explained in that entry) follows a standard pattern: the character initially learns a subset of the skill, and only later expands this understanding to the full skill (see Language).

The first two times a character receives one of these Skills (typically in Character Generation), he instead receives one of the Skill's contained Knowledges. When (or If) the character acquires the skill the third time, he receives the Skill at level-1. Until then, he has the Knowledges but only Skill-0.

If a character receives a Knowledge directly (perhaps in an ANM School) he increases that Knowledge, but not the corresponding Skill.

For example, Eneri Dinsha spent his early years (in Character Generation) in the Navy and learned Engineer. The first time he received received Starship Skill he selected Engineer, and he then selected a Knowledge (he chose J-Drive). The second time he received Starship Skill, he again selected Engineer, and again had to select a Knowledge (he chose M-Drive). The third time he received Starship Skill, he selected Engineer; this time he received Engineer-1. Somewhat later, he attended an ANM School. Engineer is not listed, so he selected M-Drive.

He has available for Task Resolution J-Drive-1, M-Drive-2, and Engineer-1. Since Skills and Knowledges stack, he can resolve most Engineer tasks at level-1, but he can resolve J-Drive tasks at level-2, and M-Drive tasks at level-3. No matter how far Eneri progresses, he will always be better at J-Drive and best at M-Drive.

This process reflects the natural specialization of the Education process: a character learns a specialization first (and that specialization always gives an advantage in that area of interest).

Musical Instruments

A character receiving skill in Musician must designate a Musical Instrument as part of his skill.

The Musical Instrument Types List shows the basic types available. This list is not exhaustive and other instruments may be available; the player and the referee can discuss and describe the specific Instrument the player learns (perhaps the Denebian sitar, the Occipitan nose flute, or the grav pulse synthesizer).

MUSICAL INSTRUMENT TYPES

Music Instrument Types

Guitar	Keyboard	Voice	Trumpet	Violin
Banjo	Piano		Trombone	Cello

The first time a character receives Musician skill, he must instead take Knowledge-1 in one of the Musical Instruments and receives Musician-0.

The second time a character receives Musician skill, he must instead take Knowledge-1 in one of the Musical Instruments (including the instrument already taken), and adds 1 to Musican.

All subsequent receipts of Musician can be taken as Musician skill.

KNOWLEDGES

A **knowledge** is a body of information based on a field of science, training, or experience. For example, Chemistry reflects the body of knowledge of theoretical and practical chemistry. The maximum attainable level of a knowledge is 6.

Career Knowledges. A character who has served in a career receives Knowledge equal to the number of terms served (to a maximum of 6).

World Knowledges. A character who has spent time on a world receives Knowledge equal to the number of terms he has lived there (maximum 6).

World Knowledge declines over time: reduce this value -1 every Term (four years) once adventuring begins.

The Sciences. Some characters can learn a specific Science through the Education process (maximum 6).

Stacking Knowledges and Skills

Although Knowledge levels are limited to a maximum of 6, they can be stacked with skills. An Engineer with Drives-7 and P-Plant-4 can perform Power Plant tasks using both Drives and P-Plant.

TALENTS

A **talent** is a personal ability not generally possible for a human, but which may be possible for some specific non-humans. For example, SoundMimic (the ability to exactly reproduce sounds). The maximum level for a specific talent is usually 15.

SPECIALS

The Specials are universally-available abilities related to interactions with other people (the Personals), and with the environment in general (the Intuitions). They are used by characters in their interactions with other (non-player) characters, and to solve puzzles.

The Personals

The Personals are used in personal interactions: they indicate the probable reaction of an individual when approached by a player character. For example, Query governs the response of a non-player character to questions from a character. The four interaction personals are:

Carouse, Query, Persuade, and **Command.**

The Intuitions

There are three Intuitions: Insight, Luck, and Curiosity. Characters from time to time are awarded values for these Intuitions in the current session and cannot be accumulated.

Curiosity relates to the serendipitous acquisition of information.

I**nsight** relates to the processing of information.

Luck relates to forcing favorable outcomes.

MODIFICATIONS (MODS)

The Task system charts include more than 30 columns of Mods (from -5 to +5) addressing a wide variety of situations. When Mods are required, the Referee consults the tables and imposes one or two of them, as dictated by the current situation.

The Skills

Skills are the primary means by which characters do things in **Traveller**. Each character has a variety of skills, and the higher a skill rating, the more expert the character is with that skill. With training, any character can eventually become proficient at any skill.

ACTOR

Actor (Act, Acting, Drama) is expertise in the dramatic arts, including an ability to adopt a personality or role, to convince an audience of a viewpoint, and to convey a wide range of emotion while involved in the role or part.

Characters with Actor have learned to conceal their true selves, their motives, and their emotions while manipulating an audience into believing whatever persona or emotion they are portraying.

Actor is a Default Skill. Most people are able to play rudimentary roles when called upon. All characters have Actor-0.

Playing Roles

Actor allows an individual to assume a role and to convince others of the validity or truth of that role.

To portray a role in a play.
Difficult (3D) < Edu + Actor
A true actor is always striving for Spectacular Success, (and dreads Spectacular Failure).

The elements of the task can be varied: Difficulty and Characteristic may be changed.

Mimicry

Actor allows a character to mimic or imitate personality traits with enough realism that they are convincing to the ordinary observer.

To mimic the mannerisms of a well-known person
Difficult (3D) < Dex + Actor

It is easier to mimic a well-known figure because the audience more easily recognizes the specific mannerisms.

Deception

Acting allows a person to deceive others by concealing true emotions and projecting false (but appropriate) ones. Acting allows successful lying (both in words and in actions).

To impersonate the actions of someone.
Difficult (3D) < Dex + Actor

This task addresses the impersonation itself. Others should address proper papers, disguise, or knowledge.

To impersonate the appearance of a specific person.
Difficult (3D) < Dex + Actor
Requires disguise or costume.

Acting In General

Acting is about playing roles (primarily for entertainment). An Actor takes on a part, which may be within a stage, voice, or video production, or may be a component of a live action event.

Acting Tasks. Acting tasks benefit from rehearsal. Many acting tasks are hasty and few are cautious.

Related Skills. Actor is one of the six Arts (Actor, Artist, Author, Chef, Dancer, and Musician).

ADMIN

Admin (Administration, Management) is skill in the management of resources, setting policy, and communicating policy to members of the organization. Admin is the ability to function within an organized structure: a company, a corporation, a crew, a team, a governmental agency, or a military unit, with an emphasis on directing resources toward the achievement of organization goals.

Characters with Administration understand the problems organizations (and organization staff) face, and have an ability to work using an existing structure and available resources. A character with Administration understands how to talk to clerks and functionaries and how to motivate them to put forth their best efforts.

To submit a project proposal to the Scout Service
Average (2D) < Int + Admin

To submit a project proposal to the Imperial Navy
Difficult (3D) < Int + Admin

The difference between the two proposals is arbitrary.

Admin in General

Administration is concerned with managing organizations.

Admin Tasks. Admin tasks often depend on other applicable skills. It is the joining of Admin with another skill that best achieves the stated goal.

Related Skills. Admin is related to **Bureaucrat** and **Leader**. **Admin** is the management of resources and involves setting policy and communicating policy to members of the organization. **Bureaucrat** is the understanding of standardized procedures within an organization, and the ability to interpret and follow those procedures. **Leader** is the ability to express power without regard to position within an organization.

ADVOCATE

Advocate (Advocacy, Law, Legal, Attorney, Lawyer) is skill in formulating and presenting logical and emotional arguments on behalf of themselves and others, primarily in a legalistic setting. Advocate is expertise in the controlling codes of behavior within society. The character has an education in, and familiarity with, the law and its interpretation. While specific details of law vary from world to world and from jurisdiction to jurisdiction, the concept of law is a constant, and the available models under which it is expressed is naturally limited. The individual knows the foundational concepts of law and how they can be applied in a variety of situations.

Characters with Advocate have the ability to formulate and present logical and emotional arguments on behalf of themselves and others.

Law 101

The character knows in what forms laws may be expressed, and how they are created, enforced, and interpreted. Since law must be recorded and somehow made available to those it applies to if it is to be effective, the person knows how to research available resources in order to make judgments on what is legal and illegal and how to make arguments in favor of each position.

Documents. The individual knows how to prepare documents in support of legal activity.

Legal Arguments. The individual knows how to frame arguments on one side of a dispute in order to achieve the best advantage.

Legal Advice. The individual is able to provide reasonable advice to others about the best way to proceed in a legal matter.

Negotiation. The individual is able to negotiate an agreement between two parties.

To negotiate a contract between two parties
Formidable (4D) < Edu + Advocate
Opposed (2).

Court Hearings. The individual can appear in court and argue a case on behalf of a client.

To argue a case in court.
Difficult (3D) < Int + Advocate
Opposed (2).

Related Skills. Advocate and **Counsellor** are related skills. **Advocate** is the ability to formulate and present logical and emotional arguments on behalf of themselves and others, primarily in a legalistic setting. **Counsellor** typically provides assistance in personal or interpersonal matters.

ANIMALS

Animals is skill in working with animals: to use them for sport, recreation, business, or other enterprises.

Characters with Animals can understand animal behavior and see how it can be used to their benefit.

Animals includes Rider, Teamster, and Trainer.

Rider

The individual knows how to ride animals.

To ride a well-trained riding animal
Easy (1D) < Dex + Rider

To ride a wild animal
Staggering (5D) < Dex + Rider

Cautious can reduce difficulty level, which is the same as ensuring the animal is docile and the activity is calm.

Showmanship. The individual is able (at higher levels of skill) to perform feats of greater difficulty involving animals.

To ride fast
Average (2D) < Str + Rider

To perform intricate maneuvers while riding
Formidable (4D) < Dex + Animals

Teamster

The individual knows how to handle animals which serve as beasts of burden, whether as pack animals, or hitched to wagons.

To drive a wagon (animal drawn).
Average (2D) < End + Teamster

Trainer

The individual knows how to train animals to do various tasks.

To train an animal for basic obedience
Average (2D) < Tra + Trainer
Difficult (3D) < Tra + Trainer

Sophont Trainer. Sophont characters with C5= Training do not learn well from teachers (and Teacher skill). They have more success learning from trainers (using Trainer).

Characters with Trainer have the ability to impart knowledge to other characters who have C5 = Tra, and to a lesser extent, to characters who have C5= Edu.

To teach (train) a skill to one student (1 year)
Difficult (3D) < Tra + Trainer

To teach (train) a skill to one C5= Edu student (1 year)
Formidable (4D) < Tra + Trainer

Specify the skill being taught (the trainer must have at least one level higher in the skill being taught). The student receives plus one level at year end. The student need not begin the course with any skill level in the skill being trained.

To train a skill to a class of students (1 year)
Difficult (3D) < Tra + Trainer
Each student must roll Tra or less to receive the skill (thus, a student with C5= Edu uses Edu/2 for Tra).

Enhancements to Trainer. The chance of success of the training task may be improved by a variety of enhancements. For example, Linguistics can be used when teaching Language.

The skill received is in place of the experience skill increase for the year. The advantage is that the skill received may be a totally new one to the student.

Notice that Training is a Knowledge used as a skill.

Notice that Trainer is the equivalent of Educator when the student characteristic C5= Training.

Animals in General

Animals is primarily about interaction with non-sophont domesticated creatures. The skill is generally of little use with wild animals (although Trainer can be used as Wild Animal Tamer). Animals is a relatively one-way communication between the character and the subject.

Related Skills. Teacher and **Trainer** are related skills. **Teacher** is the ability to impart knowledge to characters who have C5= Edu. **Trainer** is the ability to impart knowledge to characters who have C5= Tra.

ARTIST

Art (Artist) is ability to create works of fine art, including an ability to create or capture visual images, and to reproduce images through drawing, painting, or sculpture, and to convey both emotional and realistic content in their works.

Characters with Artist have learned the details of image capture and reproduction in its many different modes (drawing, painting, sculpture, photography, and video), and indicates a natural ability in the creation of fine art. Art includes a familiarity with art works, art styles, and art history.

Artist is a Default Skill. Most people are able to draw or sketch rudimentary images when called upon. All characters have Artist-0.

Supplies and Equipment. Most tasks assume that the artist has a proper supply of supplies and equipment. Special needs (supplies from all natural source, or from appropriate tech levels) are the subject of separate acquisition quests.

Art History

The individual knows the general history of fine art, including the major artists of historical periods. Individual knowledge will vary with the background of the character.

To properly identify a major piece of art
Average (2D) < Education + Artist

Art Technique and Style

The individual is experienced in the use of art materials and media. He understands styles and techniques and can copy them with some degree of faithfulness.

All artists create copies or imitations in order to learn appropriate techniques. A useful exercise is to copy an existing piece of art brushstroke for brushstroke (or chisel mark for chisel mark). To the untrained eye, such a work looks “original.”

To create a work in a specified style and technique.
Formidable (4D) < Dexterity + Artist

To identify a copy in a specified style and technique.
Difficult (3D) < Education + Artist

Art Forgery

Art forgery is a deliberate copy of an existing work, or a deliberate new creation in an existing style specifically created to defraud the viewer or buyer.

An Art Forgery is labeled by the difficulty of its detection (Difficult or easier are usually called Copies): An Easy Copy, A Formidable Forgery. A Hopeless [ly Difficult] Forgery.

A Forgery can be detected at one level of difficulty lower using appropriate Education and Skill.

Although Forgery is usually encountered in the world of Art, it can extend to other areas using the same concepts: Counterfeiting, Forgery of Signatures, Forgery of Paperwork.

To create a Difficult Copy of a Painting
Difficult (3D) < Dexterity + Artist

To detect a Difficult Copy of a Painting
Average (2D) < Education + Artist

To create a Formidable Forgery of a Sculpture
Formidable (4D) < Dexterity + Artist

To detect a Formidable Forgery of a Sculpture
Difficult (3D) < Education + Artist

Forgery Masterpieces. A Craftsman with the appropriate skill (Artist for Art Forgery) can create a Masterpiece forgery, which (if Perfect) is near undetectable).

Art Creation

The individual has talent in the field of fine art and can produce works of art which have value to the consuming public.

To create a Work of Art (1 month)
Formidable (4D) < Dexterity + Artist

Art is Primarily Visual. Art depends on the sense of Vision. A character without Vision defaults to expressing any Artist skill as Sculpture.

Non-human senses (vision in range bands other than RGB, alternate hearing, more sensitive touch, and other) influence how non-humans see (or sense) Art. An artwork which is beautiful in RGB may look sloppy in PSU or INA.

Related Skills. Artist is one of the six Arts (Actor, Artist, Author, Chef, Dancer, and Musician).

ASTROGATOR

Astrogator (Astrogation) is skill in the determination of present location and course planning to a selected destination in an interplanetary or interstellar setting.

Characters with Astrogator are responsible for plotting starship and spacecraft courses and ensuring that correct information is available to the pilot and crew as they need it. They are trained in the use of astrogation computer programs and the interpretation of long-range data provided by the ship's sensor system.

Calculating Jumps

To calculate an interstellar jump-1.
Easy (1D) < Int + Astrogator
Uncertain (1D)

To calculate an interstellar jump-2.
Average (2D) < Int + Astrogator
Uncertain (1D)

The dice for difficulty of the interstellar jump calculation equals the distance in parsecs (Jump-1 difficulty is 1D; Jump-6 Difficulty is 6D).

To manually confirm jump-1 calculations (24 hours).
Average (2D) < Edu + Astrogator
Uncertain (1D).

To manually confirm jump-5 calculations (24 hours).
Hopeless (6D) < Edu + Astrogator
Uncertain (1D).

Math (the Talent) is a Mod on Astrogation tasks.

The difficulty of manually confirming the jump calculation is one level higher than the automated calculation difficulty.

For example, Ank Dinsha 888888 Astrogation-3 is plotting out his ship's jump to the next system two parsecs away. Jump-2 makes it an Average 2D task; it has 1D Uncertainty. Ank must roll (8+3 =) 11 or less on 2D. He rolls 1D (=6) and the Referee secretly rolls the Uncertain die (=6). Assuming the Uncertain roll is 3, the Referee says: you have your final Jump input. Arv thinks the situation through (Hmm, if the Uncertain die is 6, the calculations will be wrong) and decides to manually confirm the figures.

Confirmation will take 24 hours and is a Difficult 3D task with 1D Uncertainty. He needs to roll (8+3 =11) on 3D. He rolls 2D (=5) and the Referee rolls the Uncertain die. In this case, even if the Uncertain die is 6, Arv succeeds in confirming the figures. If they were correct, the Referee would tell him they are confirmed. In this case, the Referee tells him that he found an error; the original calculations are not confirmed. Arv needs to start over.

Astrogation has two components: the calculation aspect associated with feeding the proper information into the starship controls, and the planning/ advising aspect associated with determining appropriate destinations and courses.

Related Skills. Astrogator is space-based and involves charting courses for interplanetary and interstellar craft; it is a tedious and laborious undertaking, even when aided by computers and sensors. **Navigator** is concerned with direction finding and world surface travel. **Survey** is world-based, and involves understanding observing and identifying obvious and unobvious details of the terrain.

Starship Skills. Astrogator is one of the seven Starship skills (Astrogator, Engineer, Gunner, Medic, Pilot, Sensors, and Steward).

ATHLETE

Athlete (Athletics) is skill in sports-related physical activity and competition, and with extensive or vigorous physical activity, and with sports competition.

Characters with Athletics have an understanding of physical training and conditioning. The individual knows the best way to use physical characteristics in order to maximize results, and to minimize the potential for injury. The individual can maintain his physical characteristics in peak condition, and is better able to use them in vigorous or stressful situations.

Athlete is a Default Skill. Most people are able to participate in athletics at a rudimentary level. Essentially all characters have Athlete-0.

Physical Conditioning

Athletics includes an understanding of the physical characteristics and how to maintain and improve them (this pursuit is independent of the Experience system).

To increase C1 Strength (1 year)
(3D) < Athlete

Physical Activity

Athletics can help improve a character's chance of success at various physical activities.

Ordinary Physical Barriers. Barriers are expressed qualitatively (low, high, very high) rather than quantitatively (1 meter high, 2 meters high). The qualitative description produces a Mod which makes the task more difficult.

Qualitative Mods for Height or Width are provided in the Mods table in Tasks.

To vault a wall
Average (2D) < Str + Athlete

To vault a Very High wall
Average (2D) < Str + Athlete
Must include the Very High Mod.

Eneri Dinsha (777777 Athlete-0), running from a squad of enforcers, comes upon a fence. Without a thought, he runs to the fence and tries to leap it. The Referee allows +1 for running; he needs to roll (Str = 7 plus Running = 1) = 8 or less to succeed. He rolls 5 and clears the fence.

He immediately encounters a second Very High fence, higher than the first, and he is no longer running. He needs to roll (Str = 7 plus no Mod for Running plus Very High = -3) = 4 or less to succeed.

To leap a trench
Average (2D) < Str + Athlete

To leap Very Wide trench
Average (2D) < Str + Athlete
Must include the Very Wide Mod.

Organized Sports

Athletics includes a familiarity with organized sports, including the techniques of team management and coaching to win. The individual knows the rules and details of most popular sports.

For example, Swimming is governed by Athlete (but its favored Characteristic is Grace; Humans have a natural disadvantage against sophonts who are natural swimmers.

For example, Gymnastics is governed by Athlete (buts its favored Characteristic is Agility; Humans resolve Gymnastics with Dex/2).

Coaching

The individual is able to direct others in athletics, providing them with strategy, tactics, advice, and encouragement which moves them to excel.

Athletics is primarily about personal physical development: developing and using the personal physical characteristics.

AUTHOR

Author (Writer, Writing) is ability in the literary arts. Author is ability to create written works (whether intended to be read, spoken, or heard). The primary concern of Author is the skilled use of language to convey thoughts, ideas, and images in ways which resonate with an audience.

Characters with Author have an ability to tell stories, recording them in some form for later distribution. Higher levels of writing skill represent greater proficiency in the craft of story telling.

Author is a Default Skill. Most people are able to write basic narratives when called upon. All characters have Author-0.

Creating Entertainment

The "writing" aspect of this skill (in the sense of keyboarding or recording) is the least of the ability; the important aspect is the ability to tell a story and be entertaining while doing so.

The Idea. The basic idea for created entertainment is generated with Flux and ranges from -5 Derivative to +5 Truly Inspired.

An ordinary person can roll for an Idea once every quarter. An Author can roll for an idea once per week.

Ideas are provided in the Mods table in Tasks.

To write a novel (one year).
Formidable (4D) < Int + Author + Idea + Mod2

To write a newspaper article (several hours)
Difficult (3D) < Int + Author + Idea + Mod2

To write an advertisement (an hour)
Average (2D) < Int + Author + Idea + Mod2

Author is about creating stories (primarily for entertainment).

Author Tasks. Author tasks benefit from information available in the mind of the writer.

Related Skills. Author is one of the six Arts (Actor, Artist, Author, Chef, Dancer, and Musician).

BIOLOGICS

Biologics (Biologic) is concerned with devices based on living matter. Example biologic devices include grown hull panels, interior shock absorbers, water purifiers, carbon dioxide scrubbers, and motion sensors.

Characters with biologics are skilled in the maintenance, repair, and construction of biologic devices. Biologics conveys an understanding of the principles of device construction and repair.

Fundamental Knowledge. The individual has a basic grasp of what the field of biologics is and how it can be applied to the world in general. He understands basic concepts, units of measure, and safety procedures. He is familiar the basic tools of Biologics and as a matter of course carries with him rudimentary tools which allow basic fault diagnosis.

Advanced Tools. The individual has a familiarity with sophisticated tools of Biologics and how to use them for Biologics repair.

Diagnosis and Repair. The individual's skill and experience allows him to reach basic conclusions about biologic equipment and whether it is functioning properly (or if not, the probable cause of the fault). The individual can attempt to repair biologic equipment which he has previously diagnosed as malfunctioning.

Construction. The individual can assemble biologic components into operating pieces of equipment (assuming adequate components are available and an appropriate design is on hand).

Device Design. The individual can design devices which make use of Biologics if he also has Designer.

Related Skills. Biologics and Biology are related. Biology is the broad knowledge of the study of life processes; Biologics is the practical skill in creating and using customized biological processes.

Biologics is one of the ten Trades. A trade is a skilled practice of a practical occupation. An individual with skill in one of the Trades is a skilled worker (as opposed to an unskilled worked). The ten Trades are Biologics, Craftsman, Electronics, Fluidics, Gravitics, Magnetics, Mechanic, Photonics, Polymers, and Programmer.

BROKER

Broker is skill in the marketing of goods, and represents an understanding of the business of buying and selling.

Characters with Broker act as agents for the owner of goods (and may act for themselves); when the sale takes place, the broker receives a commission.

To find a buyer for trade goods.
Difficult (3D) < Int + Broker

Trade and Commerce

Broker is used in the Trade and Commerce process.

Broker is about negotiating the best deal between a buyer and a seller. In its simplest form, the Broker transaction entails very little work while earning a commission. The value of the broker is the knowledge and expertise he provides when problems or exceptions arise.

Broker is a Mod (equals half Broker Skill, rounded up) on the Actual Value Table (to a maximum of Broker-4). Brokers receive 5% of the final sale price per DM.

Broker tasks are essentially administrative in nature; very little physical activity is required, and even communications associated with the situation can be automated or handled through appropriate interfaces.

Related Skills. Broker and **Trader** are related skills. **Broker** is the ability to bring together a seller and a buyer based on interpersonal interactions and an understanding of relative values of goods. **Trader** is the ability to independently appraise and value goods.

BUREAUCRAT

Bureaucrat (Bureaucracy) is skill in the standardized procedures within an organization, and the ability to interpret and follow those procedures.

Characters with Bureaucrat are able to analyze an organization and determine how best to use its standardized procedures to accomplish personal objectives.

Bureaucratic Regulations (BR). Large organizations maintain a bureaucratic book of regulations (BR) which details how any specific situation should be handled bureaucratically. The Book is a Mod to tasks which involve the bureaucracy.

When an organization becomes important in **Traveller** situations, the referee must determine the relative value of the Book. When an organization becomes prominent in **Traveller** situations, the game master must determine the relative value of the Book. Roll flux; it is appropriate to have a distinct value for each world. BR = +5 is more lenient in its outcomes than BR = - 5.

Record the Book for future use; this value is not necessarily known to the characters (although it may become apparent over time).

Specific organizations as published or administered by the Referee may have predefined values for their BR.

To Get A Permit
Difficult (3D) < Soc + Bureaucrat + BR + Mod2

Related Skills. Admin is related to **Bureaucrat** and **Leader**. **Admin** is the management of resources and involves setting policy and communicating policy to members of the organization. **Bureaucrat** is the understanding of standardized procedures within an organization, and the ability to interpret and follow those procedures. **Leader** is the ability to express power without regard to position within an organization.

CHEF

Chef (Cook, Shugili, Food Artist, and Osmancer) is the ability in the culinary arts.

Chef is expertise in food preparation, including the ability to conceive and create tastes and smells for a variety of audiences.

Characters with Chef have learned the foundations of food preparation and transcended it to achieve attractive tastes and smells.

To fix lunch
Easy (1D) < Edu + Chef

To prepare a feast
Difficult (3D) < Edu + Chef

Related Skills. Chef is one of the six Arts (Actor, Artist, Author, Chef, Dancer, and Musician).

COMMS

Comms (Communications) is skill in the use of technological communications equipment with a focus on primary data input.

Communications reflects a deep understanding of the operation of a wide variety of communications devices, including an understanding of the protocols of communication, an awareness of the various limitations of communicators, and an ability to quickly identify why a communication device is not working properly.

Characters with Communications know how to use basic communicators (or can puzzle them out with a minimum of effort) including telephones, radios, laser communicators and other user-friendly devices.

Communications is a Default Skill. The use of most communications equipment is obvious or intuitive.

Essentially any character who has travelled off his homeworld, or whose homeworld is TL10 or greater has the default skill Comms-0.

Other characters do not have Comms as a default.

Use and Operation

The individual has a basic familiarity with the use and operation of communicators (conveying voice, video, and other information). The medium may include radio (broadcast and beamcast), laser, and other media.

Data Input. The characteristic feature of communications equipment is the use of primary data input. Spoken words and current images are captured as they occur and are transmitted to a recipient. The process may be recorded, but it not typically further processed.

Mode Selection. The user understands the available modes of communications equipment operation, including the benefits and drawbacks of each. For example, broadcast reaches the greatest possible number of recipients, but is susceptible to interception, and reveals the location of the broadcaster; beamcast is relatively immune to interception, but must be aimed at a specific recipient.

Repair and Maintenance. The character has been trained in diagnosis and repair of faults in Communications equipment.

Sophisticated Operations (Tapping, Jamming, Cloning). The individual knows techniques for intercepting communications by others, interfering with communications by others, and imitating other communicator stations.

To intercept all unencrypted broadcasts available.
Difficult (3D) < Int + Comms
This is scanning.

To establish communicator contact with a pinnace crew.
Average (2D) < Edu + Comms + Environ + Mod2

To intercept a specific broadcast.
Difficult (3D) < Edu + Comms

To intercept a specific beamcast.
Staggering (5D) < Edu + Comms
Not possible unless in correct position.

To jam a specific broadcast
Formidable (4D) < Int + Comms
Broadcast must have been intercepted first.

Communications Equipment. Communicating requires a communicator. A task cannot be attempted unless the effect is within the capability of the equipment.

Mods (in the task statement) indicates the task should implement any appropriate modifiers for the specific equipment (generally Ease of Use).

Comms is about the exchange of information. At its most basic, Comms deals with voice information by telephone or radio; at more complex levels, it involves video, text messaging, specialized devices, and cryptography.

Related Skills. Comms, **Computer**, and **Programmer** are related skills. **Computer** is the ability to use technological office equipment and focuses on non-primary data input. **Comms** is the ability to use technological communications equipment and focuses on primary data input. **Programmer** is the ability to configure office equipment or communications equipment (as well as other equipment) to achieve desired functions.

COMPUTER

Computer (Office Equipment) is skill in the use of technological office equipment and focuses on non-primary data input.

Characters with Computer understand how to use the basic office equipment of a technological society. They view computers as essential and helpful interfaces for research, communications, and control of necessary services.

Computer is a Default Skill. At the most fundamental level, computers are transparent to the user; no skill is required: the use of computers is entirely unsupervised.

Essentially any character who has travelled off his homeworld, or whose homeworld is TL7 or greater has the default skill Computer-0. Other characters do not have Computer as a default.

Use and Operation

The individual has a basic familiarity with the use and operation of office equipment, including computers and information processors, graphics processors, duplicators, scanners.

Data Input. The characteristic feature of office equipment is the use of non-primary data input. Words are entered by keyboarding or data entry procedures rather than as spoken. Images are scanned or acquired rather than viewed. Data which has been input is then inserted into data bases, accounts, or files, and may subsequently be manipulated to produce reports or records. It may also be data mined to find relationships or insights.

File Access. An essential part of Computer is file retrieval.

To retrieve a specific file
Difficult (3D) < Int + Computer

Computer skill is about information processing: information capture, manipulation, storage, and retrieval.

Related Skills. Comms, **Computer**, and **Programmer** are related skills. **Computer** is the ability to use technological office equipment and focuses on non-primary data input. **Comms** is the ability to use technological communications equipment and focuses on primary data input. **Programmer** is the ability to configure office equipment or communications equipment (as well as other equipment) to achieve desired functions.

COUNSELLOR

Counsellor (Advisor) is skill in providing advice, guidance, or recommendations to individuals, with its emphasis on personal or interpersonal behavior.

Characters with Counsellor are able to listen to other characters and assist them in understanding their options as to behavior.

Counteracting Losses Of Sanity. Sessions with a Counsellor may increase or restore Sanity.

To Restore Sanity (one hour)
Difficult (3D) < Int + Counsellor
Uncertain (2D)
Success increases the subjects San +1 (not to exceed original San).

This is the equivalent of Grief Counselling or Traumatic Event Counselling.

To Restore Sanity (1D hours over 1D weeks)
Difficult (3D) < Int + Counsellor
Uncertain (1D)
Success increases the subjects San +1D (not to exceed original San).

Personal Advice. Sessions with a Counsellor may provide understanding of proper courses of action.

To Understand A Situation (one hour)
Difficult (3D) < Int + Counsellor
Uncertain (1D)
Success provides a Mod +Good Flux on an upcoming vital task.

Failure provides a Mod Bad Flux in an upcoming vital task.

Ignoring Advice: The character may decide to ignore the advice (and the unknown Mod).

Session Frequency. Counsellor sessions are weekly or monthly.

The Costs Of Counselling

Counsellors are professionals equivalent to Advocates or Doctors. A typical one-hour session is Cr100.

Counsellors available as ship crew typically provide their services as part of their duties.

Related Skills. Advocate and **Counsellor** are related skills. **Advocate** is the ability to formulate and present logical and emotional arguments on behalf of themselves and others, primarily in a legalistic setting. **Counsellor** typically provides assistance in personal or interpersonal matters.

CRAFTSMAN

Craftsman (Craftsperson, Craftsophont, Craftsbeing) is concerned with the production of high quality work output.

Appreciation. The character can appreciate quality and workmanship in objects, and can evaluate the degree of quality such an object has.

To evaluate the general workmanship of an object
Easy (1D) < Int + Craftsman

Evaluation. Craftsman can evaluate the specific components of QREBS.

EVALUATING QREBS

		Difficulty	Char	Skill
Q	Quality	3D	C5	Craftsman*
R	Reliability	4D	Ins	Craftsman*
E	Ease of Use	2D	C2	Craftsman*
B	Burden	2D	Str	Craftsman*
S	Safety	2D	Int	Craftsman*

* or substitute Trader.

To evaluate Quality
Difficult (3D) < C5 + Craftsman
Uncertain (1D)

To evaluate Reliability
Formidable (4D) < Ins + Craftsman
Uncertain (1D)

To evaluate Ease Of Use
Average (2D) < C2 + Craftsman
Uncertain (1D)

To evaluate Burden
Average (2D) < Str + Craftsman
Uncertain (1D)

To evaluate Safety
Average (2D) < Int + Craftsman
Uncertain (1D)

Workmanship. An individual with Craftsman can use it to improve the quality of a successful task (although it does not improve the possibility of success for a task; Cautious can achieve that result).

When creating (building, crafting, constructing) an object (but not when buying one, or evaluating one), the individual may distribute the total Craftsman skill level as Mods to the determination of QREBS rolls.

For example, Filis Ten is building a crossbow (from a kit); she has Craftsperson-6. She completes the weapon; when the game master rolls for the five QREBS values, Filis says she wants this item to be of good quality and reliable. She specifies DM +3 for Quality and +3 for Reliability on the rolls. The Referee rolls 0, 0, 0, 0, and 0. The QREBS values for the Crossbow are +3 +3 0 0 0. To confirm them (or determine them), Filis needs to go through the evaluation process.

Masterpieces

A character with Craftsman may attempt to produce a Masterpiece (using this Masterpiece process).

Designate a **Controlling Characteristic** C1 C2 C3 C4 C5 C6 which governs creating the current Masterpiece..

Master Points. Master Points available to a Craftsman include: the Controlling Characteristic, Craftsman Skill, and up to FIVE skills with level 6 or greater.

A Masterpiece cannot be attempted unless Master Points equals 40 or above.

The Masterpiece Creation Process. Roll 9D for Masterpiece Points or less for success in creation.

For example, the Craftsman has 45 Master Points when creating a Masterpiece; he must roll 45 or less (on 9D) for success.

If The Creation Fails, the Piece (not Masterpiece) is flawed and worthless.

If The Creation Is Successful, a beautiful Masterpiece has been created. Name an object capable of being lifted or carried by the Character, and reasonably created using the Skills applied. Allocate the Masterpiece points to QREBS (for the ranges -5 to +5, -5 = 1 point; +5 = 11 points). If all QREBS values are set at the Maximum, excess Master Points can be allocated equally in excess of +5.

A Perfect Masterpiece has 55 or more Master Points.

A Masterpiece can be sold at Cr150,000 plus Cr10,000 per Master Point over 39. A Perfect Masterpiece (=55 points) sells for Double (= Cr600,000). A Masterpiece increases in value about 5% per year, but subject to Flux when sold.

A Masterpiece can be created in about three years of steady, dedicated work. This time can be reduced by about one month per Master Point diverted from the work.

Craftsman is one of the ten Trades. A trade is a skilled practice of a practical occupation. An individual with skill in one of the Trades is a skilled worker (as opposed to an unskilled worked). The ten Trades are Biologics, Craftsman, Electronics, Fluidics, Gravitics, Magnetics, Mechanic, Photonics, Polymers, and Programmer.

DANCER

Dancer (Dance) is ability in the arts associated with body movement. Dance is the ability to move one's body with rhythm and grace.

Characters with Dancer have a familiarity with dance styles and techniques, and an ability to dance as a performer.

Dance History

The individual knows the general history of dance, including the major regional and ethnic types of dance. Individual knowledge will vary with the background of the character.

Dance styles vary across the universe. For obscure styles, the task needs to reflect its distance from the current territory.

To identify a dance by ethnic or regional origin
Hopeless (6D) < Edu + Dancer + (Dance) Fame
Dancer is optional for this sort of trivia question.

Identifying a Waltz (Fame= 25) is probably automatic for an average person (= 6D < 7 + 25 = 32)

Identifying a Hurap (an obscure dance from the backwaters of a world on the Trailing Frontier [Fame = 7] is harder. For an average person, (=6D < 7 + 7 = 14) its maybe 6% = Hopeless if his life depended on it. For University of Regina Professor of Dance Ingles Yreva 7778C9 Dancer-9 the task is easier (6D < 12 + 9 + 7 = 29): close to 98%.

Dance Technique and Style. The individual is experienced in the techniques and styles of dance.

To perform a dance in a specific style.
Average (2D) < Dex + Dancer
Complex dance styles and techniques may be harder.

Dance Choreography. The individual has talent in the field of dance and can lead or instruct others in specific techniques and routines.

Ballroom Dance. The individual has an acquaintance with traditional forms of ballroom dance (which may include modern dances, ethnic dances, and folk dances).

To have a nice dance with a partner.
Average (2D) < Dex + Dancer
Co-operative (2).
Success is having a good time and not looking foolish.

Related Skills. Dancer is one of the six Arts (Actor, Artist, Author, Chef, Dancer, and Musician).

DESIGNER

Designer (Design) is skill in creating new objects using available principles, components, and concepts.

Designer is used in conjunction with other skills to create new objects: Designer plus Communications can be used to create a new design for a communicator (or to build one from components otherwise on hand).

Characters with Designer understand the concepts and details of the creative process. They can create new objects by combining existing components.

For example, the shuttle from the Imperial Exploratory Cruiser Gibiluur has crashed on a world surface and its three communicators are disabled. A character with Electronics could attempt to repair any one of them. A character with Comms and Designer could combine three broken communicators to produce one functioning comm.

To combine several broken Communicators
Difficult (3D) < Dexterity + Designer + Comms

Related Skills. Designer is the ability to create new objects using available principles and concepts. Each of the Trades is the ability to use tools to create objects based on plans created by a Designer. Craftsman modifies the ability to create objects to make the resulting object of higher quality.

DIPLOMAT

Diplomat (Diplomacy) is skill in formal negotiation between governments or large organizations. Diplomacy involves communication of organizational views, the negotiation of agreements, and the resolution of disputes between governments and between large organizations.

Characters with Diplomat are able to present the views of his superiors, receive the views of other organizations, and communicate them back to his superior.

Diplomat reflects activities which specifically and formally represent a large organization; a character engaged in diplomacy is speaking for such a government or organization.

First Contact. The first contact between any two governments or large organizations is a crucial event. If poorly handled, relations between the organizations can be crippled for a long time. Diplomat attempts to gauge attitudes and opinions and react to them before misunderstandings occur.

To initiate a first contact with an organization
Formidable (4D) < Int + Diplomat
Uncertain (1D).

Negotiations. Diplomat is used in the art of negotiation enhance the negotiating position.

To negotiate a preliminary understanding
Formidable (4D) < Soc + Diplomat
Uncertain (1D).

To negotiate a win-lose agreement.
Formidable (4D) < Edu + Diplomat
Opposed (2).

To negotiate a win-win agreement.
Formidable (4D) < Int + Diplomat
Cooperative (2).

The Diplomacy Handbook (DH). Governments and large organizations maintain a bureaucratic regulation book which details how any specific situation should be handled diplomatically. Members of the organization can defend their actions to their superiors if they can demonstrate that they have used the Handbook as support of their actions. If actions succeed, then there is no need to defend them.

When an organization or government becomes prominent in **Traveller** situations, the game master must determine the relative value of the Diplomacy Handbook. Roll Flux to create a common organization-wide DM for use in Diplomat tasks. Because this value can range from +5 to - 5, the effectiveness of the DH (and Diplomacy tasks which use it) depends on its value. A government with DH +5 is very effective in diplomatic activity, regardless of the skill of its diplomats; DH -5 severely handicaps the activities of diplomats.

Record the DH value for each organization for future use. This DH is not necessarily known to the members of the organization (although it may become apparent over time).

To negotiate a preliminary understanding
Formidable (4D) < Soc + Diplomat + DH
Uncertain (1D).

The Diplomacy Handbook represents hidebound policy constraints imposed by functionaries in the upper levels of the Diplomatic Service (and ultimately governmental rulers). While the DH cannot be changed, Admin, Bureaucracy, or Liaison (as appropriate) can be used to counter some of its effect.

For example, Force Commander Dame Arlane Titanium 88789B is negotiating a preliminary understanding, but is handicapped by the Diplomatic Corps' DH -4 (and unusually restrictive set of regulations). She, however, is able to work behind the scenes for an exchange of favors with the other side (Admin-2, Bureaucracy-3 as Mods), essentially countering the negatives of the DH.

Related Skills. Liaison and Diplomat are related skills. Liaison is skill in informal coordination of relationships between different cultures or organizations. Diplomat is skill in formal negotiation between governments or large organizations.

DRIVER

Driver is skill in the operation of ground vehicles. It includes the physical aspects of driving vehicles, an awareness of the standards of driving, including with or near other vehicles, and basic procedures of preventative and curative maintenance.

Characters with Driver are qualified to operate most ground vehicles.

Knowledge is the Basis of Driver Skill. The first two times a character receives Driver (typically in character generation), he instead acquires one of the Skill's contained Knowledges.

Driver is a Default Skill. Most people are able to operate vehicles at a basic level. Essentially all characters have Driver-0.

To avoid an accident
Average (2D) < Dex + Driver

Types of Vehicles. The use of Drives skill requires knowledge on a specific type.

ACV. Air Cushion Vehicle.
Legged. Multiple jointed Legs
Mole. Underground burrowing vehicles.
Tracked. Endless tracked vehicles.
Wheeled. Ground vehicle repair knowledge.

Grav. Gravitic supported and propelled. Grav Knowledge associated with Flyer or Seafarer is equally applicable to Grav Driver.

Characters with Driver are qualified to operate most ground vehicles.

Vehicle Identification. The character can identify vehicles in general terms and often in specific terms based on education and experience.

To identify an vehicle by type and function.
Average (2D) < Edu + Driver

Vehicle Operation

Although ground craft are built to be easily operated, they are complex machines.

Ground vehicle operations tasks are detailed under Vehicle Operations in the Vehicle Chapter.

Vehicle Maintenance. Automotive is the Knowledge of ground vehicle maintenance and repair. It contrasts with the other Knowledges under Driver in that it is deeply concerned with repair, modification, and maintenance rather than operation.

ELECTRONICS

Electronics (Electronic) is concerned with devices based on electron flow. Example electronics devices include signal processors, controllers, and sensors associated with the electromagnetic spectrum.

Characters with Electronics are skilled in the maintenance, repair, and construction of electronic devices. Electronics conveys an understanding of the principles of device construction and repair.

Fundamental Knowledge. The individual has a basic grasp of what the field of Electronics is and how it can be applied to the world in general. He understands basic concepts, units of measure, and safety procedures. He is familiar the basic tools of Electronics and as a matter of course carries with him rudimentary tools which allow basic fault diagnosis.

Advanced Tools. The individual has a familiarity with sophisticated tools of Electronics and how to use them for Electronics repair.

Diagnosis and Repair. The individual's skill and experience allows him to reach basic conclusions about electronics equipment and whether it is functioning properly (or if not, the probable cause of the fault). The individual can attempt to repair electronics equipment which he has previously diagnosed as malfunctioning.

Construction. The individual can assemble electronics components into operating pieces of equipment (assuming adequate components are available and an appropriate design is on hand).

Device Design. The individual can design devices which make use of Electronics if he also has Designer.

Electronics is one of the Trades. A trade is a skilled practice of a practical occupation. An individual with skill in one of the Trades is a skilled worker (as opposed to an unskilled worked). Electronics is one of ten Trades: Biologics, Electronics, Fluidics, Gravitics, Polymers, Magnetics, Mechanic, Photonics, and Programmer.

ENGINEER

Engineer (Engineering) is skill in the operation, maintenance, and repair of the drives of starships and spacecraft.

Characters with Engineer are capable of proper operation, adjustment, and maintenance of starship maneuver drives, jump drives, and power plants. The person who does this work is an Engineer (if an officer) or Drive Hand (if not an officer).

Some ships and craft are small enough that they do not require an Engineer. In such cases, the drives are automated. Although operation does not require an Engineer (or Drive Hand) to be always present, the services of an Engineer are necessary for maintenance and overhaul.

Governing Characteristics. Engineering is divided into four distinct areas: Maneuver Drives (M-Drives and G-Drives), Jump Drives (J-Drives), and Power Plants (P-Plants), and Life Support. The governing characteristic for Engineering depends on the component being serviced.

Maneuver Drives	Int
Jump Drives	Edu
Power Plants	Str
Life Support	Dex

Drive Operation Tasks. The operation of starship and spacecraft drives requires the services of an Engineer. He or she understands the procedures and the principles behind the procedures, and can make the equipment operate reliably and efficiently.

Typical Engineer tasks and associated difficulties include:

Pre Operation Checks	Average	2D
Power Up	Average	2D
Routine Operation	Easy	1D
Overload Operation	Formidable	4D
Emergency	Difficult	3D
Power Down	Easy	1D
Basic Maintenance	Difficult	3D
Basic Repair	Difficult	3D

Diagnosis and Repair. The individual's skill and experience allows him to reach basic conclusions about drives, their function, and whether it is functioning properly (or if not, the probable cause of the fault). The individual can attempt to repair engineering equipment which he has previously diagnosed as malfunctioning.

Starship Skills. Engineer is one of the seven Starship skills (Astrogator, Engineer, Gunner, Medic, Pilot, Sensors, and Steward).

EXPLOSIVES

Explosives (Demolitions) is skill in the use of high energy devices for destructive purposes.

The individual is experienced in the proper handling, placement, and efficient use of explosives.

Recognition and Identification. The character can recognize and identify explosives and can describe their capabilities and potential effects.

To disarm a complex device.
Average (2D) < Dex + Explosives

To disarm a booby-trapped device.
Difficult (3D) < Dex + Explosives

To identify a booby-trapped package:
Average (2D) < Int + Explosives

To recognize the characteristics of the explosive used:
Difficult (3D) < Edu + Explosives

FIGHTER

Fighter (also called Fighting) is skill in conflict resolution through violence.

Characters with Fighting understand the basic elements of fights: how to attack and defend; how to select and employ weapons; and when to engage and when to withdraw.

Fighting is a Default Skill. Most people are able to engage of a fight and use basic personal weapons when called upon. Essentially all characters have Fighting-0.

To win a brawl
Difficult (3D) < Str + Unarmed
Opposed (up to 4). Resolves the brawl in one task.
All losers receive 2D hits. The winner is unscathed.

A more extended resolution of a brawl determines the loser of a specific round. The highest result (provided that result is unsuccessful) is the loser, receives 3D in damage, and is eliminated from the brawl. If no one is unsuccessful, repeat the task.

To resolve one round of a brawl.
Difficult (3D) < Str + Unarmed
Opposed (up to 6). Resolves one round of the brawl
Highest Roll (if unsuccessful) is the Loser (= 3D Hits).

Use of the Fighter skill is discussed in considerably greater detail in the Personal Combat chapter.

Soldier Skills. Fighter is one of the Soldier skills: Fighter, Forward Obs, Heavy Wpns, Navigator, Recon, and Sapper.

Related Skills. Fighter, Heavy Weapons, and Gunner are related skills. Fighter concerns personal combat, including attacking and defending using various personal weapons (defined as weapons which a person can carry). Heavy Weapons relates to the use of battlefield weapons (defined as weapons carried or deployed by vehicles or launchers). Gunner relates to the weapons installed on starships and spacecraft (and which may be installed on other large vehicles).

FLEET TACTICS

Fleet Tactics is concerned with the command and control of groups of ships for naval combat operations.

Characters with Fleet Tactics understand the planning concepts required to assemble and deploy starships in order to defeat an enemy. It necessarily includes an understanding of siege operations (including planetary bombardment), search and detection operations, and small and large battles.

Related Skills. Strategy, Tactics, and Fleet Tactics are related skills. Strategy addresses the reasons for a military or naval encounter and planning the deployment of resources to achieve an intended result. Tactics is the specific activities within a battle which help achieve victory. Fleet Tactics is the direction of multiple ships in space combat.

FLUIDICS

Fluidics (Fluidic, Hydraulic) is concerned with devices based on fluid flow and interaction. Example fluidics devices include force amplifiers (based on hydraulics), pumps, and signal processors.

Characters with Fluidics are skilled in the maintenance, repair, and construction of fluidic devices. Fluidics conveys an understanding of the principles of device construction and repair.

Fundamental Knowledge. The individual has a basic grasp of what the field of Fluidics is and how it can be applied to the world in general. He understands basic concepts, units of measure, and safety procedures. He is familiar the basic tools of Fluidics and as a matter of course carries with him rudimentary tools which allow basic fault diagnosis.

Advanced Tools. The individual has a familiarity with sophisticated tools of Fluidics and how to use them for Fluidics repair.

Diagnosis and Repair. The individual's skill and experience allows him to reach basic conclusions about fluidic equipment and whether it is functioning properly (or if not, the probable cause of the fault). The individual can attempt to repair fluidic equipment which he has previously diagnosed as malfunctioning.

Construction. The individual can assemble fluidic components into operating pieces of equipment (assuming adequate components are available and an appropriate design is on hand).

Device Design. The individual can design devices which make use of Fluidics if he also has Designer.

Fluidics is one of the ten Trades. A trade is a skilled practice of a practical occupation. An individual with skill in one of the Trades is a skilled worker (as opposed to an unskilled worked). The ten Trades are Biologics, Craftsman, Electronics, Fluidics, Gravitics, Magnetics, Mechanic, Photonics, Polymers, and Programmer.

FLYER

Flyer is skill in the operation of flying craft. It includes the physical aspects of flyer operation, an awareness of the standards of flyer operation, including air traffic control, and basic procedures of preventative and curative maintenance.

Types of Flyers. The use of Flyer skill requires knowledge on a specific type.

Aircraft Types

Flapper. Ornithopter. Aircraft which fly making use of flapping wings (essentially in imitation of birds).

LTA. Lighter-Than-Air.

Rotor. Rotary Wing.Helicopter.

Wing. Fixed Wing.

Aeronautics. Repair and maintenance of Flyers.

Grav. Gravitic supported and propelled. Grav Knowledge associated with Driver or Seafarer is equally applicable to Grav Flyer.

Characters with Flyer are qualified to operate most flying craft or aircraft.

Aircraft Identification. The character can identify aircraft in general terms and often in specific terms based on education and experience.

To identify an aircraft
Average (2D) < Edu + Flyer + Visibility

To identify an aircraft flying high overhead.
Difficult (3D) < Edu + Flyer + Visibility + Speed

Aircraft Operation

Aircraft are complex machines. Although an individual can never know the details of all possible aircraft, it is possible to know the general details of aircraft operation as well as know how to operate a specific type of aircraft well.

Licensing. An individual is licensed by an appropriate authority if he or she has skill-2 or greater. Worlds with Population 6+ and Law 5+ require a license before allowing operation of an aircraft.

Aircraft Operation Tasks. The Aircraft Operations Tasks are detailed under Vehicle Operations in the Vehicle Chapter.

Related Skills. Flyer and Pilot are related skills. Flyer is the operation of vehicles in atmosphere or in vacuum near world surfaces. Pilot is the operation of starships, spacecraft, and small craft which travel between worlds (and may involve some near world travel).

FORENSICS

Forensics (Forensic Science, Investigation) is skill in investigation, especially when related to legal matters.

Characters with Forensics understand the process of investigating situations, crime scenes, and disaster sites with the purpose of determining the circumstances which created them.

Evidence Gathering. The individual is trained to evaluate a crime scene and to gather evidence appropriate to the matter at hand.

To gather samples
Average (2D) < Dex + Forensics

Samples or evidence includes more than physical evidence; it can include a report of the nature or circumstances present at the scene.

Is There Something Else? The individual can decide that there is additional information present at the scene, and can search harder for it.

To try to find something else (additional samples)
Average (2D) < Edu + Forensics Uncertain (1D)

To gather additional samples
Average (2D) < Edu + Forensics

Drawing Conclusions. Forensics is the study of evidence; it can reasonably be expected that a character using forensics can come to conclusions about the causes of the evidence.

To draw conclusions
Formidable (4D) < Edu + Forensics
Uncertain (2D)

FORWARD OBSERVER

Forward Observer (Fwd Obs, Fire Director, Fire Controller) is skill in directing military or naval attacks against targets. A Forward Observer is trained to locate potential military targets and to direct military fire support at them. He or she is the forward eyes and ears of a military organization.

Characters with Forward Observer direct the firepower of indirect fire weapons (artillery, ortillery, gunnery).

In traditional usage (pre-starflight Terra), a Forward Observer is a military officer deployed forward of an artillery unit who locates targets and radios instructions to the unit to conduct attacks.

In current usage, a Forward Observer is any individual who is assigned to locate targets and direct attacks against them. He may be a military officer directing attacks from an artillery unit 20 km away, a clandestine agent inputting target coordinates to an ortillery ship in orbit, or an individual scouting out targets to be attacked at a later date.

The Interaction of the FO and the Gunner

An attack in which the Gunner can see (or sense through sensors) the target has no need for a Forward Observer. The attack is resolved using the skill of the Gunner.

A Forward Observer is useful if

The weapon is firing in Indirect Mode. The Gunner cannot directly see or sense the Target, and the Forward Observer substitutes his visual (or sensory) input for the Gunner's.

The weapon is subject to Scatter. The (in)accuracy of the weapon scatters the impacting projectiles. The Forward Observer substitutes his visual (or sensory) input for the Gunner's.

Traditional Fire Control

The individual knows the procedures used to call in indirect fire weaponry. The first step is to call in a preliminary (or targeting) round. If that is not a direct hit, then a second round is called in (and a third or however many are required). When a preliminary round hits the target center, then the Forward Observer commands Fire For Effect.

To call in indirect fire weaponry on a target (preliminary)
Average (2D) < Edu + Fwd Obs

Success places the first hit 100 times Flux meters from the target center. The character is observing the target and observes where the hits land. Failure indicates that the character does not see the hits impact. The task must be repeated.

If the first round is not a direct hit, standard practice calls for the point of impact to be shifted 400 meters toward the target. The second shift is 200 meters; the third shift is 100 meters.

To call in indirect fire weaponry on a target (adjusted).
Average (2D) < Dex + Fwd Obs + Mods

Character states the increment of shift (400 meters, 200 meters, 100 meters). Game master shifts the fire and indicates if it hit or missed.

To call fire for effect (final)
Easy (1D) < Dex + Fwd Obs

Local conditions can influence the accuracy of Forward Observers: climate, the confusion of combat, atmospheric effects, and others.

Non-Traditional Fire Control

The Forward Observer knows the procedures and equipment necessary for directing attacks against targets.

He knows how to place homing devices or beacons to guide attacking weapons fire. A beacon may be placed on a target to attract incoming missiles. A beacon may be placed near a target (with coded instructions to impact at some point relative to the beacon).

He knows how to identify targets by planetographic co-ordinates and forward them to the attacking weapons.

In Non-Traditional Fire Control, Forward Observer Skill is a Mod on the Attack.

Soldier Skills. Forward Observer is one of the Soldier skills: Fighter, Forward Obs, Heavy Wpns, Navigator, Recon, and Sapper.

GAMBLER

Gambler (Gambling) is skill in variety of games of chance, and includes a familiarity with the degrees of risk involved.

Characters with Gambler understand the rules and underlying laws of probability for gambling games.

Situational Analysis. The individual is able to observe and analyze gambling games and evaluate them for their degree of risk and for their legitimacy.

Spending The Evening Gambling. In cases where the referee wants to gloss over the events ("Okay, you spent the night gambling"), the character declares the total amount to be gambled.

To win a casual game
Average (2D) < Dex + Gambling
Gamble Cr1 to Cr10 per event. Winning pays double.

To win a low risk game
Difficult (3D) < Dex + Gambling
Gamble Cr10 to Cr100 per event. Winning pays triple.

To win a high risk game with opponents
Formidable (4D) < Dex + Gambling
Opposed (5). Each participant bets the same (between Cr1,000 and Cr10,000). Winner takes 90% (the remainder goes to the house).

To win a high risk game against the house
Staggering (5D) < End + Gambling
Opposed (5). Each participant bets the same (between Cr1,000 and Cr10,000). Winner takes 90% (the remainder goes to the house).

Compulsive Gambling. Some people feel they are destined to win and routinely play at gambling games.

To play the lottery (once per week)
Hopeless (6D)

Pay Cr10 for a ticket. Roll 6 ones and win Cr250,000.
Roll 5 ones to win Cr25,000. Roll 4 ones to win Cr2,500. Roll 3 ones to win Cr250. Roll 2 ones to win Cr25. Gambling skill does not affect the lottery.

GRAVITICS

Gravitics (Gravitic) is concerned with devices based on gravity control. Example gravitics devices include lifters, grav plates, and inertial compensators.

Characters with Gravitics are skilled in the maintenance, repair, and construction of gravitic devices. Gravitics conveys an understanding of the principles of device construction and repair.

Fundamental Knowledge. The individual has a basic grasp of what the field of Gravitics is and how it can be applied to the world in general. He understands basic concepts, units of measure, and safety procedures. He is familiar the basic tools of Gravitics and as a matter of course carries with him rudimentary tools which allow basic fault diagnosis.

Advanced Tools. The individual has a familiarity with sophisticated tools of Gravitics and how to use them for Gravitics repair.

Diagnosis and Repair. The individual's skill and experience allows him to reach basic conclusions about Gravitics equipment and whether it is functioning properly (or if not, the probable cause of the fault). The individual can attempt to repair Gravitic equipment which he has previously diagnosed as malfunctioning.

Construction. The individual can assemble Gravitic components into operating pieces of equipment (assuming adequate components are available and an appropriate design is on hand).

Device Design. The individual can design devices which make use of Gravitics if he also has Designer.

Gravitics is one of the ten Trades. A trade is a skilled practice of a practical occupation. An individual with skill in one of the Trades is a skilled worker (as opposed to an unskilled worked). The ten Trades are Biologics, Craftsman, Electronics, Fluidics, Gravitics, Magnetics, Mechanic, Photonics, Polymers, and Programmer.

GUNNER

Gunner (Gunnery, Ship's Guns) is skill in the targeting, operation, and maintenance of the weaponry typically used by starships and spacecraft.

Characters with Gunner are familiar with the basic operation of the weapons installed on starships.

Turret is a Default Knowledge. Most people can be assigned to operate a turret on a starship and function with at least a minimal level when called upon. Essentially all characters have Turret-0.

Types of Gunnery. The use of Gunner skill requires knowledge on a specific type.

Gunnery Types
Bay Weapons
Ortillery
Screens
Spines
Turrets

Starship Skills. Gunner is one of the seven Starship skills (Astrogator, Engineer, Gunner, Medic, Pilot, Sensors, and Steward).

Related Skills. Fighter, Heavy Weapons, and Gunner are related skills. Fighter concerns personal combat, including attacking and defending using various personal weapons (defined as weapons which a person can carry). Heavy Weapons relates to the use of battlefield weapons (defined as weapons carried or deployed by vehicles or launchers). Gunner relates to the weapons installed on starships and spacecraft (and which may be installed on other large vehicles).

HEAVY WEAPONS

Heavy Weapons (Heavy Wpns) is skill in the targeting, operation, and maintenance of the large military weapons systems. Heavy Weapons are any military weapons larger than those carried by a single person, and include Launchers, Artillery, Ordnance, and WMD (Weapons of Mass Destruction).

Characters with Heavy Weapons understand their principles of operation, the techniques of their use, and the basics of their maintenance.

Weapon Use. The individual can operate Heavy Weapons. The skill is used in personal combat.

Weapon Repair. Gun Combat skill is sufficient to allow basic repairs to weapons (primarily replacing assemblies).

Types of Heavy Weapons. The use of Heavy Weapons skill requires knowledge on a specific type.

Heavy Weapons Types
Artillery
Launchers
Ordnance
WMD

Soldier Skills. Heavy Weapons is one of the Soldier skills: Fighter, Forward Obs, Heavy Wpns, Navigator, Recon, and Sapper.

Related Skills. Fighter, Heavy Weapons, and Gunner are related skills. Fighter concerns personal combat, including attacking and defending using various personal weapons (defined as weapons which a person can carry). Heavy Weapons relates to the use of battlefield weapons (defined as weapons carried or deployed by vehicles or launchers). Gunner relates to the weapons installed on starships and spacecraft (and which may be installed on other large vehicles).

HI-G

Hi-G (High-Gravity, Hi-Gravity) is skill in functioning in High-Gravity Environments. High Gravity is defined as any environment with a Gravity higher than 1G.

Characters with Hi-G are familiar with the activities and precautions associated with Hi-G environments.

Familiarity. The individual understand the effects of High Gravity, including the higher potential for loss of balance, trips, falls, and mishaps. He understands the potential for injury if a fall occurs, and he understands that unfamiliar circumstances may distort normal reflexes and reactions.

To avoid mishap in High Gravity
Average (2D) < Dex + Hi-G

Reactions. The individual is trained to react properly in High Gravity situations. He knows how to fall to best avoid or minimize injury; he knows the behavior of objects in High Gravity.

To react to a High Gravity mishap
Average (2D) < Dex + Hi-G
Success avoids injury.

Related Skills. High-G, Hostile Environment, and Zero-G are related skills.

HOSTILE ENVIRONMENT

Hostile Environ (Hostile Environment) is skill in functioning in environments which are hostile to life. A typical Hostile Environment includes poisonous or unbreathable atmospheres, corrosive or insidious local conditions, extremes of temperature, or extremes of weather.

Familiarity. Characters with Hostile Environment understand the proper steps to protect themselves from difficult environments. The individual understand the effects of unbreathable atmospheres, of local contaminants or poisons, and of weather and temperature. He understands the potential for injury and the protective measures that should be taken.

Evaluation. The individual can recognize and identify potentially hostile environmental effects. While some may be obvious, he can identify less likely effects and bring them to others attention.

To identify potential dangers in a Hostile Environment
Difficult (3D) < Edu + Hostile Env
Properly identifies protective equipment necessary.

Reactions. The individual is trained to react properly in Hostile Environment situations. He knows how to react to best avoid or minimize injury; he knows the behavior of the elements of a Hostile Environment.

To react
Difficult (3D) < C5 + Hostile Env

Related Skills. High-G, Hostile Environment, and Zero-G are related skills.

JACK OF ALL TRADES

Jack of all Trades (JOT, rarely JOAT) is skill in acting competently in many different undertakings.

Characters with Jack of all Trades have a general education and wide experience which allows him or her to attempt many different tasks with some expectation of success in each.

Attempting Tasks. A character may attempt any task for which he or she has no other skill. The character may not use Jack-of-all-Trades in place of a skill which is already held.

Jack of All Trades can be used as a shield against the effects of the **This Is Hard! Rule.** If Skill plus JOT is equal to or greater than the number of dice being rolled on a task, then the TIH! rule does not apply. But, JOT does not directly increase the skill level used for task resolution.

Limits on Jack-of-All-Trades. A character may not use a level of Jack-Of-All-Trades which is higher than the associated personal characteristic. For example, if a task calls for Mechanics and Strength, the level of Jack-of-All-Trades used cannot exceed the character's Strength.

Jack-of-all-Trades may not be learned by experience; it must be acquired through the prior career process.

LANGUAGE

Language is skill in communications between sophonts using a commonly accepted symbol set.

Native Language is (usually) Anglic. Every character has a native language: the one learned in childhood and the one currently used. The level of skill in a native language is equal to the higher of the character's Intelligence or Edu (not C5).

Native Language is Default Language. A character's native language in **Traveller** is, by default, Anglic. Anglic is a form of English evolved over the course of thousands of years and heavily influenced by other languages it has encountered. If a character does not specifically choose another language, his or her native language is the default language.

Additional Languages. When Language is received, the individual selects a specific foreign language other than his or her native language. The first receipt of Language is at one level less than the character's Native Language. Each additional receipt of Language allows selection of another language at one level less than the previous. Language skill level received = Native minus number of Language receipts. For example, a character 777777 has English as his native Language. He receives Language five times, and takes each in a separate language: He has English-7, Spanish-6, French-5, German-4, Italian-3, Swedish-2.

If the character elects, additional receipts of Language can instead increase a non-native language, but never to more than Native Language.

For example, Eneri Dinsha's native language is Anglic; his skill is Language (Anglic)-7. He can speak it well, with a reasonable vocabulary. He occasionally makes simple grammatical errors. During one of his careers, he receives Language. He selects Vilani (the other major language in the Imperium) and receives it at on level less than his Native Language. He has Language (Vilani)-6. He receives Language a second time: he uses it to increase Vilani (to Language (Vilani)-7. He receives Language a third time. It cannot be used to increase Vilani beyond his Native Language, so he selects Gvegh and receives (level= Native minus number of receipts = 7-3= 4) Language (Gvegh)-4.

Recording Languages A Character Knows: Record this skill as Language (Specific). For example, Language (Spanish) or Language (Geonee).

Related Skills. Language and Linguistics are related skills. Language is the ability to hear, speak, and use a specific language. Linguistics is the specialized study of all languages.

LANGUAGES

!kee:	K'kree	The trade language spoken by most space-faring K'kree.
Anglic	Imperial	One of two standard Imperial languages: derived originally from the English spoken in the Rule of Man (then called Galanglic).
Battle	Imperial	The battlefield language of the Imperial Star Marines.
Gvegh	Vargr	The most commonly encountered Vargr language, spoken by most Vargr.
Oynprith	Droyne	Ancient ritual language of the Droyne.
Sagamaal	Sword Worlds	The common language of the Sword Worlds, derived from Icelandic spoken on Terra after the collapse of the Rule of Man but before the founding of the Third Imperium.
Tezapet	Darrian	The Darrian spoken language.
Trokh	Aslan	The Aslan spoken language.
Vilani	Imperial	One of two standard languages spoken in the Third Imperium, derived originally from the language spoken in the First Imperium.
Zdetl	Zhodani	The Zhodani spoken language.

LEADER

Leader (Leadership) is skill in expressing personal power to persuade or command others to perform specific tasks.

Characters with Leader know what actions are required in order to lead others.

Appointed Leaders. Within organizations, leaders are appointed (for example, military or naval officers). These individuals have rank and position, but they may not necessarily have Leadership skill.

Emergent Leaders. Individuals who have Leader, regardless of their rank or position, are emergent leaders. They are natural leaders with an ability to know what steps to take and what orders to give.

Related Skills. Admin is related to **Bureaucrat** and **Leader**. **Admin** is the management of resources and involves setting policy and communicating policy to members of the organization. **Bureaucrat** is the understanding of standardized procedures within an organization, and the ability to interpret and follow those procedures. **Leader** is the ability to express power without regard to position within an organization.

LIAISON

Liaison is skill in informal coordination of relationships between different cultures or organizations; it includes an ability to guide them toward achievement of a common purpose.

Characters with Liaison are trained in the art of dealing with others; this skill is usable in relations with members of military units, citizens in a community, and with alien or foreign cultures.

This individual is trained to subordinate his own views and prejudices where they may conflict with those opinions held by the individuals he is dealing with. As a result, greater cooperation can be achieved and progress in mutual projects made.

Related Skills. Liaison and Diplomat are related skills. Liaison is skill in informal coordination of relationships between different cultures or organizations. Diplomat is skill in formal negotiation between governments or large organizations.

MAGNETICS

Magnetics (Magnetic) is concerned with devices based on magnetism and magnetic fields. Example magnetic

devices include manipulators and bearings, and sensors.

Characters with Magnetics are skilled in the maintenance, repair, and construction of magnetic devices. Magnetics conveys an understanding of the principles of device construction and repair.

Fundamental Knowledge. The individual has a basic grasp of what the field of Magnetics and how it can be applied to the world in general. He understands basic concepts, units of measure, and safety procedures. He is familiar the basic tools of Magnetics and as a matter of course carries with him rudimentary tools which allow basic fault diagnosis.

Advanced Tools. The individual has a familiarity with sophisticated tools of Magnetics and how to use them for Magnetics repair.

Diagnosis and Repair. The individual's skill and experience allows him to reach basic conclusions about Magnetics equipment and whether it is functioning properly (or if not, the probable cause of the fault). The individual can attempt to repair Magnetics equipment which he has previously diagnosed as malfunctioning.

Construction. The individual can assemble Magnetics components into operating pieces of equipment (assuming adequate components are available and an appropriate design is on hand).

Device Design. The individual can design devices which make use of Magnetics if he also has Designer.

Magnetics is one of the ten Trades. A trade is a skilled practice of a practical occupation. An individual with skill in one of the Trades is a skilled worker (as opposed to an unskilled worked). The ten Trades are Biologics, Craftsman, Electronics, Fluidics, Gravitics, Magnetics, Mechanic, Photonics, Polymers, and Programmer.

MECHANIC

Mechanic (Mechanics, Mechanical) is concerned with devices based on mechanical interaction. Example mechanical devices include motors, drive trains, and structural components.

Characters with Mechanic are skilled in the maintenance, repair, and construction of mechanical devices. Mechanic conveys an understanding of the principles of device construction and repair.

Mechanic is a Default Skill. Most people are able to accomplish basic mechanical tasks when necessary. Essentially all characters have Mechanic-0.

Fundamental Knowledge. The individual has a basic grasp of what the field of Mechanics is and how it can be applied to the world in general. He understands basic concepts, units of measure, and safety procedures. He is familiar the basic tools of Mechanics and as a matter of course carries with him rudimentary tools which allow basic fault diagnosis.

Advanced Tools. The individual has a familiarity with sophisticated tools of Mechanics and how to use them for Mechanics repair.

Diagnosis and Repair. The individual's skill and experience allows him to reach basic conclusions about Mechanics equipment and whether it is functioning properly (or if not, the probable cause of the fault). The individual can attempt to repair Mechanics equipment which he has previously diagnosed as malfunctioning.

Construction. The individual can assemble Mechanics components into operating pieces of equipment (assuming adequate components are available and an appropriate design is on hand).

Device Design. The individual can design devices which make use of Mechanics if he also has Designer.

Mechanic is one of the ten Trades. A trade is a skilled practice of a practical occupation. An individual with skill in one of the Trades is a skilled worker (as opposed to an unskilled worked). The ten Trades are Biologics, Craftsman, Electronics, Fluidics, Gravitics, Magnetics, Mechanic, Photonics, Polymers, and Programmer.

MEDIC

Medic (Medical, Medicine, Doctor, Healer) is skill in the healing arts.

Characters with Medic understand injuries and illnesses and how they are treated. They can diagnose physical and mental illnesses and they can prescribe treatment to improve or cure them.

Treating Injury and Illness

When a Doctor (or Medic) examines a patient, he must determine three elements: Location, Severity, and Diagnosis.

The Referee determines the three elements (through a process of logic, or through consultation of the Malfunctions Table).

Location details the anatomical or the biological location of the illness or injury. Injuries are typically anatomical; illnesses are typically biological.

Severity details how serious the illness is, and how difficulty the treatment task is.

Diagnosis details how difficult the task of defining the illness is.

Palliative Treatment. Until the Medic succeeds in Diagnosis, he can only provide palliative treatment (pain relief, basic physical support, stopping bleeding).

To provide palliative treatment (Variable Hours)
Average (2D) < C5 + Medic

Success stabilizes the patient. Failure increases Severity 1D.

Diagnosis. The Medic resolves the Diagnosis task.

To Diagnose an Illness (Variable Hours)

To diagnose an injury or illness.
Difficulty (nD) < C5 + Medic
Uncertain (Difficulty minus 1). Anyone may try to diagnose an illness or injury.

Difficulty (nD) < C5 + Medic + Diagnostic Tools
Uncertain (Difficulty minus 3).

The result of the successful task reveals the Severity of the injury or illness. If the task fails, the diagnosis is Unknown, and a repeat attempt at diagnosis must be made the following day.

Each successive diagnosis receives a Mod +1 (the third diagnosis receives Mod +2).

If the Diagnosis task fails, the Referee creates a false Diagnosis (roll 1D for the Severity).

Treatment. The Medic resolves the Treatment task.

To replace an injured anatomic location
Severity (nD) < Dex + Medic +1 + Equipment
Item must be available as a spare.

To repair an injured anatomic location
Severity (nD) < Dex + Medic
Uncertain (1D)

To treat a diseased biological component
Severity (nD) < C5 + Medic
Uncertain (1D)

Treatment of anatomic locations is governed by Dextrerity. Treatment of Biological location is governed by C5.

Improper treatment (created by a false or incorrect diagnosis) worsens a patient's Severity +1 D per day.

For example, a soldier appears at the military aid station complaining of muscle pain. The referee rolls for Location (= 6 = Respiration), Severity (=1 = Easy treatment), and Diagnosis (= 4 Formidable diagnosis).

Doctor Emerald 777777 Medic-2 prescribes palliative treatment and then attempts a diagnosis with Tools+2).

To diagnose an injury or illness.
Formidable (4D) < C5 + Medic + Diagnostic Tools+2
Uncertain (Difficulty minus 3).

Doctor Emerald needs to roll (=7 + 2 + 2 =) 11 or less on 4D. He rolls 3-3-3 and the Referee rolls the uncertain die = 1). Assuming the Uncertain Roll = 3, the Referee tells the Doctor the Diagnosis fails (although it actually succeeded).

Meanwhile, the Doctor resolves palliative therapy.

To provide palliative treatment (Variable Hours)
Average (2D) < C5 + Medic

He needs to roll (7 + 2 = 9 or less on 2D. He rolls 11 and fails. The patient's condition worsens to Severity = 2D.

Doctor Emerald 777777 Medic-2 tries a new diagnosis the next day.

Doctor Emerald has a Mod + 1 for the second diagnosis and needs to roll (=7 + 2 + 2 +1=) 12 or less on 4D. He rolls 2-3-4 and the Referee rolls the uncertain die = 6. Assuming the Uncertain Roll = 3, the Referee tells the that the Severity is (= roll 1D = 3 =) Difficult, and that the location is Biological Digestion (the Doctor thinks "Can that be right?").

The Doctor begins treatment.

To treat a diseased biological component
Difficult (3D) < C5 + Medic
Uncertain (1D)

He needs to roll (= 7 + 2 =) 9 or less on 3D. He rolls 5 + 5 which indicates success despite the Uncertain die. The patient's condition worsens to Severity = 3D.

Xeno-Medicine. Medics are routinely educated (or trained) in the treatment of sophonts beyond their own species. Nevertheless, they encounter situations beyond their experience. Xeno-Medicine (on the Mods table) provides a Mod for such encounters.

Starship Skills. Medic is one of the seven Starship skills (Astrogator, Engineer, Gunner, Medic, Pilot, Sensors, and Steward).

MUSICIAN

Musician (Music) is ability in the auditory arts.

Musician is a skill in the creation of entertaining sounds, including the ability to play a musical instrument, to sing (or hum, or whistle), and to convey a wide range of emotion while playing music.

Music Appreciation. The individual enjoys music and understands its power and its interest. He or she has a background in the field which allows reasonable discussion with others who also appreciate music.

Performing. The individual can play one or more musical instruments (or can sing).

Musical Instruments. The use of Musician skill requires knowledge on a specific type.

Music Instrument Types

Banjo	Keyboard	Trumpet
Cello	Mandolin	Viola
Guitar	Piano	Violin
Horn	Synthesizer	Voice

Other instruments are also possible

The first time a character receives Musician skill, he must instead take Knowledge-1 in one of the Musical Instruments and receives Musician-0.

The second time a character receives Musician skill, he must instead take Knowledge-1 in one of the Musical Instruments (including the instrument already taken), and adds 1 to Musican.

All subsequent receipts of Musician can be taken as Musician skill.

Related Skills. Musician is one of the six Arts (Actor, Artist, Author, Chef, Dancer, and Musician).

NAVAL ARCHITECT

Naval Architect is skill in design of starships and spacecraft.

The individual is trained in the design of starships and small craft. Knowledge of the requirements for accurate, usable ship design plans and of the details of ship design are part of this skill.

The use of this skill is governed by the starship design and construction rules and does not allow the invention of new devices or equipment.

Ship Identification. Naval Architect enables an individual to identify starships by mission (and to estimate weapons, drives, or performance) based on an external examination.

NAVIGATOR

Navigator (Navigation) is skill in the determination of present location and course planning to a selected destination in a world surface setting.

Characters with Navigator know how to use navigation instruments (compass, inertial navigator, maps, direction finders), and have developed spatial sense that helps determine position.

Map Reading. The individual can find his or her current position on a map.

To find current position on a map
Average (2D) < Edu + Navigator Uncertain (1D)

Course Plotting. The individual can determine and express the best (or most efficient, or most useful) course to be taken (for vehicles in association with a world surface).

To plot a course
Difficult (3D) < Int + Navigator Uncertain (1D)

Soldier Skills. Navigator is one of the Soldier skills: Fighter, Forward Obs, Heavy Wpns, Navigator, Recon, and Sapper.

Related Skills. Astrogator is space-based and involves charting courses for interplanetary and interstellar craft; it is a tedious and laborious undertaking, even when aided by computers and sensors. **Navigator** is concerned with world surface travel. **Survey** is world-based, and involves understanding observing and identifying obvious and unobvious details of the terrain.

PHOTONICS

Photonics (Photonic) is concerned with devices and materials based on light, electromagnetic radiation, and photon flow. Photonics devices include those which emit or radiate photons externally (including radio frequency devices, lasers, and illuminators), or which make use of photon flow internally (as in fiber optics, photon cascades, and vision devices).

Characters with Photonics are skilled in the maintenance, repair, and construction of photonic devices. Photonics conveys an understanding of the principles of device construction and repair.

Fundamental Knowledge. The individual has a basic grasp of what the field of Photonics is and how it can be applied to the world in general. He understands basic concepts, units of measure, and safety procedures. He is familiar the basic tools of Photonics and as a matter of course carries with him rudimentary tools which allow basic fault diagnosis.

Advanced Tools. The individual has a familiarity with sophisticated tools of Photonics and how to use them for Photonics repair.

Diagnosis and Repair. The individual's skill and experience allows him to reach basic conclusions about Photonics equipment and whether it is functioning properly (or if not, the probable cause of the fault). The individual can attempt to repair Photonics equipment which he has previously diagnosed as malfunctioning.

Construction. The individual can assemble Photonics components into operating pieces of equipment (assuming adequate components are available and an appropriate design is on hand).

Device Design. The individual can design devices which make use of Photonics if he also has Designer.

Photonics is one of the ten Trades. A trade is a skilled practice of a practical occupation. An individual with skill in one of the Trades is a skilled worker (as opposed to an unskilled worked). The ten Trades are Biologics, Craftsman, Electronics, Fluidics, Gravitics, Magnetics, Mechanic, Photonics, Polymers, and Programmer.

PILOT

Pilot is skill in the maneuver of ships and small craft.

Characters with Pilot can operate a ship, directing its launch, its movement from place to place, and its landing at a starport or other suitable location.

To perform a preflight check on a deep space fighter.
Easy (1D) < Edu + Pilot

To launch/take-off a deep space fighter.
Average (2D) < Dex + Pilot

To travel to a destination in a deep space fighter.
Easy (1D) < Dex + Pilot

To maneuver against an opponent in a space fighter.
Average (2D) < Dex + Pilot
Opposed (2). Success provides Advantage-3 in Dogfight.

To attack a target with a deep space fighter
Average (2D) < Dex + Pilot
A successful attack drives off the defender.

To return to base with a deep space fighter.
Average (2D) < Dex + Pilot

Starship Skills. Pilot is one of the seven Starship skills (Astrogator, Engineer, Gunner, Medic, Pilot, Sensors, and Steward).

POLYMERS

Polymers (Polymer, Plastics) is concerned with devices and materials based on plastics. Many polymer uses are structural, including coatings, adhesives, and rigid, flexible, or transparent panels. Polymer devices include fittings (hinges, gaskets), textiles, and impact absorbing armor.

Characters with Polymers are skilled in the maintenance, repair, and construction of polymer devices. Polymers conveys an understanding of the principles of device construction and repair.

Fundamental Knowledge. The individual has a basic grasp of what the field of Polymers is and how it can be applied to the world in general. He understands basic concepts, units of measure, and safety procedures. He is familiar the basic tools of Polymers and as a matter of course carries with him rudimentary tools which allow basic fault diagnosis.

Advanced Tools. The individual has a familiarity with sophisticated tools of Polymers and how to use them for Polymers repair.

Diagnosis and Repair. The individual's skill and experience allows him to reach basic conclusions about Polymers equipment and whether it is functioning properly (or if not, the probable cause of the fault). The individual can attempt to repair Polymers equipment which he has previously diagnosed as malfunctioning.

Construction. The individual can assemble Polymers components into operating pieces of equipment (assuming adequate components are available and an appropriate design is on hand).

Device Design. The individual can design devices which make use of Polymers if he also has Designer.

Related Skills. Chemisty and **Polymers** are related. Chemistry is the broad knowledge of the study o f matter; Polymers is the practical skill in creating and using plastics.

Polymers is one of the ten Trades. A trade is a skilled practice of a practical occupation. An individual with skill in one of the Trades is a skilled worker (as opposed to an unskilled worked). The ten Trades are Biologics, Craftsman, Electronics, Fluidics, Gravitics, Magnetics, Mechanic, Photonics, Polymers, and Programmer.

PROGRAMMER

Programmer (Programming, Coding, Coder) is concerned with the operating and control systems of both analog and digital devices. Programmer includes installation of devices, adjustment to operate with within prescribed parameters, and detailed configuration for specific tasks.

Characters with Programmer are skilled in the process and procedures of programming devices to correctly accomplish their functions. Programmer conveys an understanding of the principles of programming languages, analysis of systems, writing programs in higher level languages, and debugging of problems.

Fundamental Knowledge. The individual has a basic grasp of what the field of Programmer is and how it can be applied to the world in general. He understands basic concepts, units of measure, and safety procedures. He is familiar the basic software tools of Programming.

Advanced Tools. The individual has a familiarity with sophisticated tools of Programming and how to use them.

Device (or Program) Design. The individual can design complex programs from scratch (or using existing code modules) if he also has Designer skill.

Diagnosis and Repair. The individual's skill and experience allows him to reach basic conclusions about Programming problems, determine whether specific programs are functioning properly (or if not, the probable cause of the fault). The individual can attempt to repair Programs which he has previously diagnosed as malfunctioning.

Related Skills. Comms, **Computer**, and **Programmer** are related skills. **Computer** is the ability to use technological office equipment and focuses on non-primary data input. **Comms** is the ability to use technological communications equipment and focuses on primary data input. **Programmer** is the ability to configure office equipment or communications equipment (as well as other equipment) to achieve desired functions.

Programmer is one of the ten Trades. A trade is a skilled practice of a practical occupation. An individual with skill in one of the Trades is a skilled worker (as opposed to an unskilled worked). The ten Trades are Biologics, Craftsman, Electronics, Fluidics, Gravitics, Magnetics, Mechanic, Photonics,, Polymers, and Programmer.

RECON

Recon (Reconnaissance) is skill in gathering information about military and naval operations and units.

Characters with Recon collect information on or near the battlefield in support of their military forces and report it to higher headquarters. The individual is skilled in military scouting and is capable of moving about in the wilderness without being detected.

Collecting Information

The individual can move through Terrain, and Local Hexes avoiding detection by locals or natives, or by military or civil authorities.

The individual travels through individual hexes in search of military information.

Recon In A Terrain Hex. The individual may determine the presence of military forces in the Terrain Hex. A proper recon takes about a day.

To Locate Military Forces in a Terrain Hex (if any)
Difficult (3D) < End + Recon

Success indicates the presence of the military force and the Local Hex in which it is located.

Recon In A Local Hex. The individual may determine the presence of military forces in the hex. A proper recon takes about a day.

To Assess Military Forces In A local Hex (if any)
Difficult (3D) < End + Recon

Success indicates the size of the military force, its weapons and vehicles, and its apparent mission or purpose.

Recon In A Single Hex. The individual may precisely identify military forces or civilian targets with sufficient precision to allow planning attacks, or for targeting by artillery or ortillery.

To Identify Potential Targets
Average (2D) < Edu + Recon

Identifying a potential target by its location in a Single Hex is sufficient for it to be targetted and attacked by artillery or ortillery.

Soldier Skills. Recon is one of the Soldier skills: Fighter, Forward Obs, Heavy Wpns, Navigator, Recon, and Sapper.

SAPPER

Sapper (Combat Engineer) is skill in rapid construction or demolition under military conditions.

Characters with Sapper can perform a variety of tasks under combat conditions, including bridge-building, placing and clearing minefields, building defenses, and constructing roads and bases.

Soldier Skills. Sapper is one of the Soldier skills: Fighter, Forward Obs, Heavy Wpns, Navigator, Recon, and Sapper.

SEAFARER

Seafarer (Sailor) is skill in the operation of watercraft. Seafarer is skill in the operation of watercraft. It includes the physical aspects of operating watercraft, an awareness of the protocols of watercraft traffic, and basic procedures of preventative and curative maintenance.

Types of Watercraft

The use of Seafarer skill requires knowledge on a specific type of watercraft.

Boat. A small watercraft suitable for use on rivers and lakes, or in the ocean or sea portion of shore terrain. A Boat is a vehicle of less than 100 displacement tons.

Submarine. A vessel capable of operating underwater.

Ship. A large watercraft suitable for operation in oceans and seas, including the ocean or sea portion of shore terrain. A Ship is a vehicle of more than 100 displacement tons.

Grav. A watercraft equivalent in size to a Boat, which additionally is moved by Grav technology and capable of moving through atmosphere above water surfaces. Grav Knowledge associated with Driver or Flyer is equally applicable to Grav Seafarer.

Characters with Watercraft are qualified to operate all types.

Watercraft Identification. The character can identify watercraft in general terms and often in specific terms based on education and experience.

To identify an watercraft
Average (2D) < Edu + Seafarer + Visibility

To identify an watercraft far out to sea.
Difficult (3D) < Edu + Watercraft + Visibility

Watercraft Operation

Watercraft operation tasks are detailed under Vehicle Operations in the Vehicle Chapter.

SENSORS

Sensors is skill in the use of technological sensory equipment: the artificial devices which extend and enhance the natural senses. Sensors detect a variety of stimuli and provide it in readable form to the sensor operator; this skill reflects the ability to understand and use that information.

Characters with Sensor understand the role of sensors in military, naval, scout, and commercial activity, He or she can discuss intelligently a variety of sensors and their functions.

Starship Skills. Sensors is one of the seven Starship skills (Astrogator, Engineer, Gunner, Medic, Pilot, Sensors, and Steward).

STEALTH

Stealth (Clandestine, Spycraft) is skill in moving or functioning without being detected.

Characters with Stealth understand how to move silently and unobserved.

Stealth Movement. The individual is able to move undetected.

To move undetected
Difficult (3D) < End + Stealth

Stealth Equipment. Unfortunately, Stealth itself is of no benefit against automated electronic surveillance devices or robots. There are pieces of equipment which frustrate automated surveillance, and Stealth is of value in their use.

Evaluation. The individual is able to evaluate the difficulty of penetrating the defenses of a location.

To evaluate the defenses of a location (from outside)
Difficult (3D) < Int + Stealth
Uncertain (2D). Result is a difficulty level.

To evaluate the defenses of a location (from a tour).
Difficult (3D) < Int + Stealth
Uncertain (1D). Result is a difficulty level.

Penetrating Defenses. The individual is able to overcome or bypass the defenses of a location.

To enter premises.
Difficult (3D) < Dex + Stealth
Difficulty level is set from previous evaluation.

To sneak past a guard into a nuclear power plant.
Staggering (5D) < Int + Stealth
Uncertain (1D)

STEWARD

Steward (Servant, Purser) is skill in meeting the personal needs of others.

Characters with Steward understand the basic elements of personal service. They can receive basic instructions and execute them. Higher levels of Steward involve personal initiative and anticipation of the needs of the employer.

Steward is a Default Skill. Most people are able to attend to the personal needs of others when necessary. Essentially all characters have Steward-0.

Servant. The individual has training as a servant, and knows the details of personal service, including meal preparation, domestic duties (cleaning, laundry), and general help.

Executive Assistant. The individual has training and experience as an executive assistant or secretary, and knows the details of service within the business environment, including scheduling, note taking, and correspondence.

Starship Skills

Steward is a vital role aboard merchant ships.

Steward (typically 4th Officer). The individual has training and experience as a steward (the passenger service oriented crew position on starships), including meal service, entertainment, and general assistance.

Although starship officer responsibilities vary from ship to ship, the 4th Officer is typically the Steward. He sells tickets and arranges accommodations for passengers when in port; during voyages, he tends to the needs of the passengers (especially the High Passengers).

A good Steward can arrange advance accommodations for passengers (for a “fee” of 1% of the ticket price).

A good Steward can make reasonable tips from satisfied passengers at the end of the voyage.

Tips (in Credits) =
Good Flux * Steward * 10 * High Passengers

FreightMaster. The individual has training or experience in the handling of freight (designates goods carried for a fee by a ship) and cargo (trade goods bought by the ship owner and carried as speculation), including knowledge of proper stowage, environmental conditions, and quarantine and health requirements.

Freightmaster is an additional duty for the Steward.

Related Skills. Steward is one of the seven Starship skills (Astrogator, Engineer, Gunner, Medic, Pilot, Sensors, and Steward).

STRATEGY

Strategy is skill in formulating long-range or high level plans for business, military, or athletics. Strategy deals with the planned reasons for the encounters or confrontations and with the intended results; strategy is much more the realm of the players, rather than of the characters.

Strategic Planning. Players make general plans for their characters' actions. When they make such plans, the level of Strategy skill the characters have must be considered by the game master when those plans are implemented.

Strategy is not to be confused with Tactics (naval tactics concerns the operation of starships and spacecraft).

Naval Strategy

The individual is trained and experienced in the deployment and operations of groups of naval spacecraft.

Analysis. The individual can analyze information about spacecraft deployment and arrive at an understanding, based on that information, of the strategies and tactics that those forces will use.

Space Combat. Fleet Tactics is used in space combat.

Related Skills. Strategy, Tactics, and Fleet Tactics are related skills. Strategy addresses the reasons for a military or naval encounter and planning the deployment of resources to achieve an intended result. Tactics is the specific activities within a battle which help achieve victory. Fleet Tactics is the direction of multiple ships in space combat.

STREETWISE

Streetwise is skill in interacting with local subcultures.

Characters with Streetwise are acquainted with the ways of local subcultures and are capable of dealing with strangers without alienating them. Close-knit subcultures generally reject contact with strangers or unknown elements. Streetwise allows interaction for the purposes of obtaining information, hiring, purchasing or selling contraband or stolen goods, and other shady or borderline activities .

SURVEY

Survey (Exploration) is skill in the art of wilderness exploration and mapping, which includes an ability to move through rough areas with ease and to evaluate the resources and features of the territory.

Characters with Survey understand the details of exploring, mapping, and otherwise recording information about worlds.

Exploratory Survey

The individual can move through territory which is not clearly mapped or explored, and note its key geographic features. If there are intelligent beings in the territory, the character can make contact and evaluate them as well.

Individuals conducting Planetary Surveys produce reports in the form of a hex map of the territory being explored.

World Hex Survey. The character enters a World Hex and proceeds to populate its constituent Terrain Hexes on a map.

An individual entering a Terrain Hex can discover and record the basic Terrain identification for the hex in about a day. An individual with Survey can discover (or deduce) and record the basic Terrain identification for the hex (and for adjacent hexes equal to his Survey skill) by traveling through it.

In addition,

To Locate Resource Hexes in a World Hex (if any)
Difficult (3D) < Edu + Survey

To Locate Population Centers in a World Hex (if any)
Difficult (3D) < Edu + Survey

To Locate Military Forces in a World Hex (if any)
Difficult (3D) < Edu + Survey

To Locate Natives in a World Hex (if any)
Difficult (3D) < Edu + Survey

Upon exiting the World Hex, the individual produces a Report consisting of a Map of the Terrain Hexes in the World Hex.

Terrain Hex Survey. The individual can conduct a rigorous Resource Survey of a Terrain Hex, populating it with Local Hexes in much the same manner as a World Hex Recon.

An individual with Survey can discover (or deduce) and record the basic Terrain identification for a Local hex (and for adjacent Local hexes equal to his Survey skill) by traveling through it.

Upon exiting the Terrain Hex, the individual produces a Report consisting of a Map of the Local Hexes in the Terrain Hex.

Related Skills. Astrogator is space-based and involves charting courses for interplanetary and interstellar craft; it is a tedious and laborious undertaking, even when aided by computers and sensors. **Navigator** is concerned with world surface travel. **Survey** is world-based, and involves understanding observing and identifying obvious and unobvious details of the terrain.

SURVIVAL

Survival is skill in remaining alive in the face of dangerous situations or locations.

Characters with Survival expertise are adept at locating food and water, constructing natural weapons and shelter, setting simple wildlife traps, and travelling across country, in a wilderness or hostile environment.

In The Wild. The individual knows the basic steps to be taken when cast into the wild without standard resources.

To determine the best direction to travel.

Average (2D) < Int + Survival

To locate suitable food and water.
Average (2D) < Int + Survival

To create suitable shelter
Average (2D) < Int + Survival

In Emergencies. The individual has an ability to respond in emergencies (vehicle crashes, surprise attacks, disasters).

To pick the right course of action.
Difficult (3D) < Int + Survival

Hunting and Fishing. Survival is concerned with wilderness activity. It necessarily includes the ability to hunt animals and gather foodstuffs. Hunting itself is a situation rather than a skill.

TACTICS

Tactics is skill in engaging and defeating an opponent in conflict situations.

Military Tactics

The character has training and experience in small unit tactics and operations (for military units of up to company size, or about 500 troops).

Combat Situations. Tactics is used in combat.

Close Order Drill (Rifle or Sword). The individual knows how to participate in military parades, marches, and ceremonies. He or she knows how to manipulate small arms in Close Order Drill, and how to give orders to others when in a position of leadership.

To properly march a unit of soldiers through a plaza
Difficult (3D) < Edu + Tactics

Naval Tactics

The individual knows how to operate starships and spacecraft in combat and maneuver situations.

Combat. Naval Tactics is used in space combat.

Naval Tactics concerns the operation of starships and spacecraft; Fleet Tactics concerns the operation of groups of starships or spacecraft)

Related Skills. Strategy, Tactics, and Fleet Tactics are related skills. Strategy addresses the reasons for a military or naval encounter and planning the deployment of resources to achieve an intended result. Tactics is the specific activities within a battle which help achieve victory. Fleet Tactics is the direction of multiple ships in space combat.

TEACHER

Teacher (Instruction, Instructor, Teaching) is skill in imparting knowledge to others in classroom or practical situations.

Characters with Teacher have the ability to impart knowledge to other characters who have C5 = Edu, and to a lesser extent, to characters who have C5= Tra.

To teach a skill to one student (1 year)
Difficult (3D) < Edu + Teacher

To teach a skill to one C5= Tra student (1 year)
Formidable (4D) < Edu + Teacher

Specify skill being taught (the teacher must have at least one level higher in the skill being taught). Student receives plus one level at year end. The student need not begin the course with any skill level in the skill being taught.

To teach a skill to a class of students (1 year)
Difficult (3D) < Edu + Teacher
Each student must roll Edu or less to receive the skill (thus, a student with C5= Tra uses Tra/2 for Edu).

Enhancements to Teacher. The chance of success of the instruction task may be improved by a variety of enhancements. For example, Linguistics can be used when teaching Language.

The skill received is in place of the experience skill increase for the year. The advantage is that the skill received may be a totally new one to the student.

Related Skills. Teacher and **Trainer** are related skills. **Teacher** is the ability to impart knowledge to characters who have C5= Edu. **Trainer** is the ability to impart knowledge to characters who have C5= Tra.

TRADER

Trader is skill in identifying goods and estimating their value in the local market.

Characters with Trader have learned to identify a wide variety of objects and to evaluate them in terms of their relative scarcity (both locally, and throughout the universe). They can determine with some degree of accuracy the current local market price of objects.

To evaluate a trade good or cargo
Difficult (3D) < Int + Trader
Uncertain (1D)

Evaluation. Objects are (or can be) described in the QREBS system to indicate their level of Quality, Reliability, Ease of Use, Burden, and Safety. Trader (and Craftsman) can evaluate the specific components of QREBS.

Appraisal. Trader (but not Craftsman) can also estimate the value of an object.

EVALUATING QREBS

		Difficulty	Char	Skill
Q	Quality	3D	C5	Trader*
R	Reliability	4D	Ins	Trader*
E	Ease of Use	2D	C2	Trader*
B	Burden	2D	Str	Trader*
S	Safety	2D	Int	Trader*
	Value	3D	Int	Trader

* or substitute Craftsman.

To evaluate Quality
Difficult (3D) < C5 + Trader
Uncertain (1D)

To evaluate Reliability
Formidable (4D) < Ins + Trader
Uncertain (1D)

To evaluate Ease Of Use

Average(2D) < C2 + Trader
Uncertain (1D)

To evaluate Burden
Average (2D) < Str + Trader
Uncertain (1D)

To evaluate Safety
Average (2D) < Int + Trader
Uncertain (1D)

To estimate Value
Difficult (3D) < Int + Trader
Uncertain (1D)

Trade and Commerce

Trader provides an understanding of market processes. Trader allows one die on the Actual Value Table to be rolled in advance; each level of Trader allows a throw one day in advance of the sale date.

For example, a character with Trader-3 can roll one die on the 2D Actual Value Table (on the Trade Charts) three days before the transaction. Using simple logic, he can predict the minimum and maximum values on that table (reflecting his experience in such transactions). If the transaction will not produce sufficient profit, he can cancel it and move on.

Related Skills. Broker and **Trader** are related skills. **Broker** is the ability to bring together a seller and a buyer based on interpersonal interactions and an understanding of relative values of goods. **Trader** is the ability to independently appraise and value goods.

VACC SUIT

Vacc Suit (Space Suit, Vacuum Suit) is skill in functioning in Vacuum environments, and using vacuum suits and environmental protective equipment.

Characters with Vacc Suit know how to examine a vacc suit, ascertain that it is functional, put it on, check its seals, and maneuver while wearing it without causing a tear in the fabric.

Vacc Suit is a Default Skill. Most people are able to wear a Vacc Suit, with suitable caution and attention, when necessary. All characters have Vacc Suit-0.

To put on and wear a vacc suit.
Average (2D) < Dex + Vacc Suit
Cooperative (1 Vacc Suit)

Mishaps. There are opportunities for mishaps while wearing environmental protection equipment.

To patch a vacc suit (minor problem)
Average (2D) < Dex + Vacc Suit

To patch a vacc suit (major problem)
Difficult (3D) < Dex + Vacc Suit

Other Equipment. Vacc suit skill is also usable with respirators, filter masks, high temperature environment suits, and low temperature suits.

ZERO-G

Zero-G (Zero-Gravity) is skill in functioning in Zero-Gravity environments.

Characters with Zero-G have developed the basic abilities to function in non-gravity environments, including using secondary limbs to stabilize themselves, understanding how to move from place to place, predicting the position of self and others based on the laws of motion, and internalizing basic safety procedures.

To leap a Vlong Gap between ships in deep space
Average (2D) < Dex + Zero-G

To leap a Distant Gap between ships in deep space
Difficult (3D) < Dex + Zero-G

Immediate Action

Immediate Action is the trained automatic response to a problem, without regard to diagnosis or probable cause.

Soldiers, mechanics, technicians, and clerks all respond to an equipment malfunction by performing Immediate Action.

When a weapon, device or component fails or malfunctions, identify the appropriate skill and

Check Skill (2D)

Success makes the severity of the malfunction or damage Easy 1D and the device remains operable.

A result of 12 is automatic failure.

THE TRADES

A trade is a skilled practice of a practical occupation. An individual with skill in one of the Trades is a skilled worker (as opposed to an unskilled worked). There are ten Trades: Biologics, Craftsman, Electronics, Fluidics, Gravitics, Magnetics, Mechanics, Photonics, Polymers, and Programming.

Each trade has a standard response to emergency or important situations. The expert skill holder gets an inspiration and says:

Biologics	Add more amino acid.
Craftman	Slap on another coat of varnish.
Electronics	Reverse the polarity.
Fluidics	Purge the primary (/secondary) feed.
Gravitics	Filter out the harmonics.
Magnetics	Adjust the pole tolerance.
Mechanics	Give it a whack!
Photonics	Increase (/decrease) the wavelength.
Polymers	Reverse the last ion pair.
Programming	Run the error suppression routine.

He then rolls Immediate Action.

The Knowledges

A **knowledge** is a body of information based on a field of science, training, or experience. For example, Chemistry reflects the body of knowledge of theoretical and practical chemistry. The maximum attainable level of a knowledge is 6.

Academia (Academics) is the general Knowledge associated with the profession of scholar.

ACV (Air Cushion Vehicle) is the Knowledge associated with the operation of vehicles using ACV technology.

Aeronautics is the Knowledge of Flyer maintenance and repair. It contrasts with the other Knowledges under Flyer in that it is deeply concerned with repair, modification, and maintenance rather than operation.

Aquanautics is the Knowledge of watercraft maintenance and repair. It contrasts with the other Knowledges under Watercraft in that it is deeply concerned with repair, modification, and maintenance rather than operation.

Archeology is the scientific study of civilizations, societies, and cultures

Artillery is the Knowledge associated with the targeting, operation, and maintenance of the artillery weapons systems.

Automotive is the Knowledge of ground vehicle maintenance and repair. It contrasts with the other Knowledges under Driver in that it is deeply concerned with repair, modification, and maintenance rather than operation.

BattleDress is skill in the use, care, and repair of personal combat armor, including Powered Armor. Battle Dress is also required to use weapons designated as Portable.

Bay Weapons is the Knowledge associated with large starship weapons installations (those mounted in Bays).

Beams is the Knowledge associated with the use, maintenance, and repair of personal energy weapons.

Biology is the scientific study of living organisms

Blades is the Knowledge associated with the use, maintenance, and repair of blade or edged weapons.

Boat is the Knowledge associated with the operation of small watercraft.

Capital is the general Knowledge associated with Capital, the center of the Imperium.

Career is the general Knowledge associated with a specific <Career>.

Chemistry is the scientific study of matter at the atomic, molecular, and macromolecular levels

Exotics is the Knowledge associated with the use, maintenance, and repair of strange, unorthodox, or unusual personal weapons.

Flapper (Ornithopter, Flapping Wing Aircraft) is the Knowledge associated with the operation of aircraft which use flapping wings.

G-Drive is the Knowledge associated with the operation of gravitic drives. G-Drives are a subset of M-Drives, and this obscure Knowledge is typically learned by citizens and functionaries.

Grav (Grav Vehicle) is the Knowledge associated with the operation of vehicles using gravitics technology.

Grav (Grav Watercraft) is the Knowledge associated with the operation of watercraft using gravitics technology.

Grav (Grav Flyer) is the Knowledge associated with the operation of flying craft using gravitics technology.

History is the scientific study of events over time

J-Drive is the Knowledge associated with the operation of jump drives.

Launcher is the Knowledge associated with the targeting, operation, and maintenance of the military launcher weapons systems.

Legged is the Knowledge associated with the operation of vehicles supported by and propelled by legs. Legged is the controlling Knowledge for Units (a form of personal armor).

Life Support is the Knowledge associated with the operation of life support systems.

Linguistics is the scientific study of languages

LTA (Lighter Than Air Craft) is the Knowledge associated with the operation of lighter-than-air craft.

Maneuver Drive (M-Drive) is the Knowledge associated with the operation of maneuver drives. It includes G-Drives.

Mole is the Knowledge associated with the operation of vehicles which burrow underground.

Ordnance (Gun Repair) is the Knowledge associated with military weapon maintenance and repair.

Ortillery (Orbital Bombardment) is the Knowledge associated with the targeting, operation, and maintenance of the orbital bombardment systems.

Philosophy is the scientific study of the purpose or purposes of life

Physics is the scientific study of fundamental laws of the universe

Planetology is the scientific study of structure and characteristics of worlds

P-Plant is the Knowledge associated with the operation of fusion (and other) power generating plants.

Psionicology is the scientific study of psionics and paranormal activity.

Psychohistory is the scientific study of extremely large populations. Psychohistory is a predictive and manipulative science which envisions specific stimuli applied to a large population to achieve a specific result.

Psychology is the scientific study of mental processes and behavior.

Regina is the general Knowledge associated with the world of Regina.

Rider (Equestrian) is the Knowledge associated with the use of animals as personal transport.

Robotics is the scientific study of the design, construction or creation, and maintenance of artificial beings

Rotor (Helicopter, Rotary Wing Aircraft) is the Knowledge associated with the operation of aircraft which use rotary wings.

Scout Service (Scout) is the general Knowledge associated with the profession of scout.

Screens is the Knowledge associated with the operation of protective screens.

Ship is the Knowledge associated with the operation of large scale ocean-going surface watercraft.

Slug Throwers is the Knowledge associated with the use, maintenance, and repair of personal bullet-firing weapons.

Small Craft (Ship's Boat) is the Knowledge associated with the operation of spacecraft typically smaller than 100 tons.

Soldier (Army, Military) is the general Knowledge associated with the profession of soldier.

Sophontology (Xenology) is the scientific study of intelligent beings

Spacecraft ACS (Spaceship, Spacecraft) is the Knowledge associated with the piloting or direction of spacecraft in the ACS series (larger than Small Craft but smaller than 2500 tons).

Spacecraft BCS (Big Spaceship, Big Spacecraft, BCS Spacecraft) is the Knowledge associated with the piloting or direction of spacecraft in the BCS series (larger than 2400 tons).

Spacer (Navy, Naval) is the general Knowledge associated with the profession of spacer.

Spines is the Knowledge associated with the operation of spinal weaponry for starships and spacecraft.

Sprays is the Knowledge associated with the use, maintenance, and repair of personal spray weapons.

Sub (Submarine, Submersible) is the Knowledge associated with the operation of subsurface watercraft.

Teamster is the Knowledge associated with the use of animals as beasts of burden and the loading and unloading of transport vehicles (especially beast-drawn vehicles).

Tracked is the Knowledge associated with the operation of vehicles propelled by endless tracks.

Trainer (Training) is the Knowledge associated with changing behavior of animals (and of sophonts with C5 = Training).

Turret is the Knowledge associated with the operation of turret based weaponry.

Unarmed (Unarmed Combat, Melee, Brawling) is the Knowledge associated with unarmed combat techniques.

Wheeled (Wheeled Vehicle) is the Knowledge associated with the operation of vehicles which use wheels.

Wing (Fixed Wing Aircraft) is the Knowledge associated with the operation of fixed wing aircraft.

WMD (Weapons of Mass Destruction) is the Knowledge associated with the targeting, operation, and maintenance of the Weapons of Mass Destruction.

World is the general Knowledge associated with <World>.

Many other Knowledges are possible: one for every career; one for every world; one for every branch of science, and many specialized subsets of the Knowledges shown.

The Talents

A **talent** is a personal ability not generally possible for a human, but which may be possible for some specific non-humans. The maximum level for a specific talent is usually 15.

COMPUTE

Compute is the native ability to perform detailed or extensive information processing rapidly and without external aids or devices.

Compute essentially mimics the information processing capabilities of an electronic computer. The individual can scan text at high speed and make simple or complex notations. The ability includes both text processing and number processing.

For example, scan pages of text in search of specific words or groups of words, or scan pages of numbers and calculate sums, averages, or other relationships.

To scan a text searching for instances of <World Name>
Difficult (3D) < Int + Compute

To scan accounting documents to calculate values
Difficult (3D) < Int + Compute

Success and Failure. Success completes the task and provides the results. Failure halts the task half way through. The task can be restarted to complete the current text scanning.

Fatigue. Using Compute can be taxing. Check C3 after each task: failure advances C3 to its next stage (optimal becomes ordinary; ordinary becomes tired; tired becomes sleepy).

ACCURACY VERSUS SPEED

Difficulty	Speed	Errors	Search Size
1D Easy	1 sec	1 in 10	3 pages
2D Average	1 min	1 in 100	9 pages
3D Difficult	2 min	1 in 1,000	27 pages
4D Formidable	3 min	1 in 10,000	81 pages
5D Staggering	5 min	1 in 100,000	243 pages

Speed = per page.
Errors = missed references or ignored values.

EMPATH

Empath (Empathy) is the native ability to sense and understand the emotions of others.

Empathy is either a variant of, or related to, the sense of Perception. An Empath is able to sense the emotional state of other beings and sophonts.

TYPICAL EMOTIONAL STATES

Flux	Emotion	Degree	Comment
-5	Distress	Utmost	
-4	Hate	Extreme	
-3	Fear	Major	
-2	Surprise	Significant	
-1	Unease	Minor	
0	Blank	Trivial (or masked)	
1	Calm	Minor	
2	Surprise	Significant	
3	Courage	Major	
4	Love	Extreme	
5	Delight	Utmost	

To Scan for Emotional Content
Average (2D) < C4 + Empath
Points out specific individuals and their emotional state

To Sense a General Emotional State
Average (2D) < C4 + Empath

To Sense the Emotional State of a Specific Person
Difficult (3D) < C4 + Empath

HIBERNATE

Hibernate is the native ability to enter a short-term or long-term state of reduced consciousness and physical activity.

Hibernation is a survival mechanism based on an evolutionary need to avoid extremes of weather or environment, or to undergo prolonged healing.

Going Into Hibernation.

Hibernation may be voluntary or involuntary.

Voluntary. Hibernation is a voluntary act. The individual makes a conscious decision to hibernate. He finds a safe place (his bunk; a remote corner somewhere) and falls asleep with some plan for total sleep time (in weeks).

Involuntary. Any wounding which would otherwise kill the character converts to involuntary hibernation. The individual enters hibernation automatically. Hibernation lasts weeks equal to C3. Upon emergence, characteristics are returned to normal.

In Hibernation

A character in hibernation requires no food or water; reasonable breathing gases are required. He is unconscious and unaware of external circumstances.

Waking Up

A character awakens after some passage of time (measured in days). The character is extremely hungry and thirsty.

To Wake From Voluntary Hibernation
Average (2D) < C3 + Hibernation

Success= Awaken at the planned time.
Failure= Awaken at planned time + Good Flux Days.

Involuntary Hibernation ends after C3 weeks.

HYPNO

Hypno is the native ability to create altered mental states in which the subject's critical thinking faculties are bypassed or overridden.

Hypno interacts with non-player characters find answers to questions and to force compliance or action. Hypno uses a variety of senses to work its effect, but appears to the observer to be extra-sensory.

To Create the Hypnotic State
Difficult (3D) < C4 + Hypno

If the hypnotic state is not created, then no further hypno is possible. If the state is created,

To Ask Questions
Check Query + 2x Hypno

To Persuade to Do <something>
Check Persuade + 3x Hypno

To Command to Do <something>
Check Command + 4x Hypno

Failure in each case results in feeble or ineffective attempts by the subject (rather than outright refusal).

Post Hypnotic Suggestions. Hypno may be used to implant reasonable post hypnotic suggestions which remain in effect on the subject for (subject's) C3 days.

Mass Hypnosis

A user of Hypno may affect multiple subjects simultaneously.

INTUITION

Intuition is the native ability to generate or obtain information without any apparent operation of the senses.

Akin to Insight. The character can see (or puzzle out) correct action, which usually expresses itself as a question: "Why don't we try (blank)?"

Treat Intuition as a Characteristic and Check Intuition.

Helpful In Choices. In tasks which present choices, Intuition is an acceptable substitute for the suggested skill.

Intuition Failure

When a task using Intuition fails, the Talent becomes unreliable for a time. On the next use of Intuition, use it at Level-1, and increase the level +1 every use until it regains its original value.

MATH

Math is the native ability to perform detailed or extensive mathematical calculations rapidly and without external aids or devices. The individual is able to do math "in his head."

Provided the individual understands the specific mathematics (as evidenced by C5), the individual can (for example):

- Add or subtract columns of numbers,
- Multiply or divide multi-digit numbers,
- Find roots
- Identify prime numbers.
- Solve equations for unknowns.

To Solve Basic Math (1 digit)
Easy (1D) < (Int or C5) + Math

To Solve Basic Math (2 digit)
Average (2D) < (Int or C5) + Math

To Solve Basic Math (3 digit)
Difficult (3D) < (Int or C5) + Math

To Solve Basic Math (4 digit)
Formidable (4D) < (Int or C5) + Math

To Solve Basic Math (5 digit)
Staggering (5D) < (Int or C5) + Math

Astrogation. Math is a Mod for Astrogator tasks.

Math Speeds Up Calculations. When Math is used as a Mod in calculation tasks, it radically cuts the time required (by 90%).

MEMAWARE

MemAware (Eidetic Awareness Memory) is the native ability to recall in great detail previous experiences through the sense of Awareness.

Recall. The individual can recall (in Awareness descriptive terms) specific facts or elements of his experience when prompted by need or by query.

Descriptive Terms. The individual can describe the facts (details of description, intensity, field strengths, aspect, and benchmarks) as they were sensed, and as if they were being sensed at the present moment.

Accuracy. For the ability to use words to describe the facts, Check Int for each major fact.

MEMORIZE

Memorize is the native ability to recall in great detail previously acquired information.

Memorization. The individual can consciously scan pages of information and repeat it (verbally) as needed. The acquisition of information is automatic and without effort.

To Repeat Memorized Information from the Last Day

Past Day	Easy (1D)	< (Int or Ins) + Memorize
Past Week	Average (2D)	< (Int or Ins) + Memorize
Past Month	Difficult (3D)	< (Int or Ins) + Memorize
Half Year	Formidable (4D)	< (Int or Ins) + Memorize
Year	Staggering (5D)	< (Int or Ins) + Memorize
Term	Hopeless (6D)	< (Int or Ins) + Memorize
Life Stage	Impossible (7D)	< (Int or Ins) + Memorize
Lifetime	Beyond (8D)	< (Int or Ins) + Memorize

Memory Purge. Memorized materials disappear from memory over time (as reflected by the increased difficulty of the tasks).

Memory Retention. An individual can consciously retain memorized information by consciously recalling specific information (and alerting the Referee).

Memory Capacity. The individual's capacity for Memorization is roughly 10^M (M= Memorization) pages.

Memory Failure. A failed Memory Task can be re-attempted under Immediate Action. If Immediate Action fails, the information is lost.

MEMPERCEPT

MemPercep (Eidetic Perception Memory) is the native ability to recall in great detail previous experiences through the sense of Perception.

Recall. The individual can recall (in Perception descriptive terms) specific facts or elements of his experience when prompted by need or by query.

Descriptive Terms. The individual can describe the facts (details of description, intensity, field strengths, aspect, and degree of emotion) as they were sensed, and as if they were being sensed at the present moment.

Accuracy. For the ability to use words to describe the facts, Check Int for each major fact.

MEMSCENT

MemScent (Eidetic Scent Memory) is the native ability to recall in great detail previous experiences through the sense of Smell.

Recall. The individual can recall (in Smell descriptive terms) specific facts or elements of his experience when prompted by need or by query.

Descriptive Terms. The individual can describe the facts (details of description, intensity, odor identity, and benchmarks) as they were sensed, and as if they were being sensed at the present moment.

Accuracy. For the ability to use words to describe the facts, Check Int for each major fact.

MEMSIGHT

MemSight (Eidetic Visual Memory; Photographic Memory) is the native ability to recall in great detail previous experiences through the sense of Vision.

Recall. The individual can recall (in Visual descriptive terms) specific facts or elements of his experience when prompted by need or by query.

Descriptive Terms. The individual can describe the facts (details of description, intensity, color, and benchmarks) as they were sensed, and as if they were being sensed at the present moment.

Accuracy. For the ability to use words to describe the facts, Check Int for each major fact.

MEMSOUND

MemSound (Eidetic Aural Memory; Phonographic Memory) is the native ability to recall in great detail previous experiences through the sense of Hearing.

Recall. The individual can recall (in Awareness descriptive terms) specific facts or elements of his experience when prompted by need or by query.

Descriptive Terms. The individual can describe the facts (details of description, intensity, pitch, melody, benchmarks) as they were sensed, and as if they were being sensed at the present moment.

Accuracy. For the ability to use words to describe the facts, Check Int for each major fact.

MORPH

Morph is the native ability to change the shape, contours, appearance, and coloration of one's body.

Within limits, the individual can change the shape and appearance of his body.

Appearances

Morph can change skin color and texture to imitate almost any example encountered.

Morph can extrude additional limbs, or enhance existing limbs to mimic examples.

Morph can reproduce faithfully mimic existing faces.

Limits

The total mass of the body cannot change.

Volume cannot change more than plus or minus 10%.

Structures can be formed, but they are non-functional (additional eyes don't actually see, for example).

Fanciful Morph activity is always possible. Morph activity which is faithful to a pattern or model requires access to images, pictures, or examples.

To Morph to an Existing Pattern Faithful at Range= 2
Average (2D) < Dex + Morph + Art + Craftsman

To Morph to an Existing Pattern Faithful at Range = 1
Difficult (3D) < Dex + Morph + Art + Craftsman

To Morph to an Existing Pattern Faithful at Range = 0
Formidable (4D) < Dex + Morph + Art + Craftsman

Morph in the Natural State. The natural use of Morph is fanciful: it has cultural or biological imperatives which do not require faithfulness to patterns or originals. It is only as Morph has moved into a wider society that its other uses have become known.

RAGE

Rage is the native ability to enter a heightened emotional state characterized by increased physical characteristics, and insensitivity to pain and wounds,

Increased Physical Characteristics. At the beginning of any Fighting situation, the point value of Rage may be distributed among any of the three physical characteristics C1 C2 C3.

Combat Effects. Injuries and wounds in combat reduce Rage points first.

Stopping Rage. Rage naturally exhausts itself after C3 Rounds (Minutes), at which point the individual is Tired.

Rage can be stopped with an Intelligence Check or a Sanity Check. If successful, the individual returns to a normal state (and if the duration of the rage has been less than half of C3, there is no other effect; otherwise he is Tired).

Situations For Rage

Rage can be called into use in situations with an identifiable adversary. Typically, this adversary is an enemy in combat, but it may also be physical barriers, elements of the environment (a violent storm).

SOUNDMIMIC

SoundMimic is the native ability to recreate or imitate sounds which the individual has previously heard.

Expression. The individual has the ability to mimic complex sounds and express them as required.

To Mimic A Sound
Difficult (3D) < Dexterity + SoundMimic

Master Mods Tables

- -Modifications (Mods) indicate a deviation from the norm or standard. Mods can be determined with Flux from the tables, or they can be selected as appropriate by the referee.

MODS

Master Mods Index

Table

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2	Max Visibility	Respect*	Attitude	Conformity	Imagination	Beauty		
3	Walking	Driving	Highway	Injuries	Vilani	NewSpeak	Anglic	
4	Height*	Width*	Stability*	Idea	CommEnviron	Logic	Weather	
5	Gravity	Typical BR	Typical DH	Xeno-Medicine*	Wounds*	Severity*	Diagnosis	
6	Rewards*	Speed	Speed	Encounter Range	Breakout1	Breakout2		- -
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8	TL Low	TL High	TL Vhigh	TL Extreme	- -	Multiples	Noise	- -
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10	Gravity	Acceleration	Environ	Zero-G				

1 TYPICAL MODS-1

Flux	Environ	Touch	Sound	Smell	Light	Pain	Truth	Flux
-5	Frigid	Frigid	- -	- -	- -	- -	GAEWK *	-5
-4	Vcold	VCold	- -	- -		Numb	Unsettling	-4
-3	Cold	Cold	Faint	- -	Dim	- -	Obviously False	-3
-2	Chilly	Chilly	Whisper	Subliminal	Obscured	Normal	False	-2
-1	Cool	Cool	Soft	Subtle	Hazy	Normal	Not Quite	-1
0	Nice	Normal	Talking	Ordinary	Visible	Normal	Ordinary	0
+1	Warm	Warm	Loud	Fragrant	Bright	Discomfort	Good Enough	+1
+2	VWarm	VWarm	Shout	Pungent	VBright	Stinging	True	+2
+3	Hot	Hot	Cacaphony	- -	UBright	Painful	Obviously True	+3
+4	Vhot	VHot	- -	Overwhelm	Blinding	VPainful	Epiphany	+4
+5	Scalding	Scalding	- -	- -	Burning	Unbearable	Absolute Truth	+5

*GAEWK (pronounced Gawk!) Goes Against Everything We Know.

2 TYPICAL MODS-2

Flux- -	Max Visibility	Respect*	- -	Attitude	Conformity	Imagination	Beauty	Flux
-5	Contact	Non-acknowledgement		Unenthusiastic	Total Conformist	Idiotic	Repulsive	-5
-4	Reading	Utter Contempt	- -	- -	- -	Foolish	Ugly	-4
-3	Talking	- -	- -	Unsupportive	- -	VDull	VUnattractive	-3
-2	Vshort	Distaste	- -	- -	Collectivist	Dull	Unattractive	-2
-1	Short	- -	- -	Indifferent	- -	Pedestrian	VPlain	-1
0	Visible	Peer	- -	- -	Balanced	Ordinary	Plain	0
+1	Medium	- -	- -	Interested	- -	Sharp	Cute	+1
+2	Long	Acknowledgement		- -	Individualist	Clever	Pretty	+2
+3	Vlong	Admiration	- -	Supportive	- -	VClever	VPretty	+3
+4	Distant	Absolute Respect		- -	Egotist	Creative	Beautiful	+4
+5	Vdistant	Idolization	- -	Enthusiastic	Narcissist	Genius	Stunning	+5

*Typically Social1 minus Social2.

The Mods shown in these tables are typical for inclusion in tasks. When the Referee knows an appropriate descriptor, these tables show the corresponding Mod. On the other hand, if the Referee does not know the proper descriptor, or has no preference, then he or she can roll Flux on an appropriate column or columns to determine the Mods.

Many of the Mods on these tables represent a human standard (for temperature, sound, or other effects). Non-human effects may be different.

Master Mods Tables

- -Modifications (Mods) indicate a deviation from the norm or standard. Mods can be determined with Flux from the tables, or they can be selected as appropriate by the referee.

MODS

3 TYPICAL MODS-3

Flux- -	Walking	Driving	Highway	Injuries	Vilani	NewSpeak	Anglic	Flux
-5	- -	Stuck	Stuck	Very Heavy	- -	Worst*	Worst	-5
-4	- -	- -	- -	Heavy	- -	DoublePlusUnGood	Atrocious	-4
-3	- -	Stop & Go	- -	Common	- -	PlusUnGood	Very Bad	-3
-2	Crawl	VSlow	Creeping	Light	- -	Ungood	Worse	-2
-1	Stroll	Slow	Lagging	Slight	- -	HalfUnGood	Bad	-1
0	Walk	Drive	Cruise	Scratch	- -		Average	0
+1	Trot	Fast	Fast Lane	- -	- -	HalfGood	Good	+1
+2	Run	VFast	Vfast Lane	- -	- -	Good	Better	+2
+3	Sprint	Racing	Grid Control	- -	- -	PlusGood	Very Good	+3
+4	- -	- -	Speeding	- -	- -	DoublePlusGood	Excellent	+4
+5	- -	- -	- -	- -	- -	Best*	Best	+5

*Technically Ungrammatical.

4 TYPICAL MODS-4

Flux- -	Height*	Width*	Stability*	Idea	Comms Environ	Logic	Weather	Flux
-5	Formidable	Formidable	Formidable	Derivative	Jammed	Indeterminate	Extremely Bad	-5
-4	Challenging	Challenging	Challenging	Boring	Equip Fault	Fuzzy	Very Bad	-4
-3	Very High	Very Wide	Very Unstable	Dull	Equip Glitch	Meaningless	Worse	-3
-2	High	Wide	Unstable	Uninspired	Interference	False	Bad	-2
-1	Barrier	Barrier	Shaky	Unoriginal	Static	Probably False	Inconvenient	-1
0	Ordinary	Ordinary	Stable	Ordinary	Good	Logical	Neutral	0
1	Low	- -	- -	Novel	Very Good	Probably True	Fortuitous	+1
2	- -	- -	- -	Ingenious	Excellent	True	Good	+2
3	Flat	- -	- -	Innovative	Clear	Self-Referential	Better	+3
4	- -	- -	- -	Imaginative	Very Clear	Unsolvable	Very Good	+4
5	- -	- -	- -	Truly Inspired	Crystal Clear	Paradoxical	Extremely Good	+5

* For barriers, use Bad Flux.

5 TYPICAL MODS-5

Flux- -	Gravity	Typical BR	Typical DH	Xeno-Medicine*	Wounds*	Severity*		Diagnosis		Flux
-5	World=0	General	- -	Illogical	Vheavy	Intense	5D	Extremely Obscure	5D	-5
-4	World=1	SuSAG	K'Kree	Obscure	Heavy	Critical	4D	Obscure	4D	-4
-3	World=2-3	Tukera	Solomani	Very Strange	Common	Serious	3D	Very Difficult	3D	-3
-2	World=4-5	Sharurshid	Zhodani	Strange	Light	Fair	2D	Difficult	2D	-2
-1	World=6	- -	- -	Uncommon	Slight	Good	1D	Hard	1D	-1
0	Normal	Naasirka	Imperium	Ordinary	Scratch	Scratch	- -	Ordinary	- -	0
1	World=8	- -	Aslan	- -	- -	- -	- -	Easy	- -	+1
2	World=9	Makhidkarun	- -	- -	- -	- -	- -	Clear	- -	+2
3	World=A	Sternmetal	Ziru Sirka	- -	- -	- -	- -	Very Clear	- -	+3
4	World=B	LSP	Hiver	- -	- -	- -	- -	Obvious	- -	+4
5	World=C	- -	- -	- -	- -	- -	- -	Very Obvious	- -	+5

* Bad Flux	Bureaucratic Regs	Diplomatic Handbook		from BTSD				

The Mods shown in these tables are typical for inclusion in tasks. When the Referee knows an appropriate descriptor, these tables show the corresponding Mod. On the other hand, if the Referee does not know the proper descriptor, or has no preference, then he or she can roll Flux on an appropriate column or columns to determine the Mods.

Many of the Mods on these tables represent a human standard (for temperature, sound, or other effects). Non-human effects may be different.

Master Mods Tables

- -Modifications (Mods) indicate a deviation from the norm or standard. Mods can be determined with Flux from the tables, or they can be selected as appropriate by the referee.

MODS

6 TYPICAL MODS-6

Flux-	- Rewards*	Speed	Speed	Encounter Range	Time In Jump	Commercial Breakout	Naval Breakout	Flux
-6		5 kph	Creep					
-5	- -	10 kph	Crawl	Contact		- 10 hours	- 5 hours	-5
-4	- -	20 kph	Xslow	VShort		- 8 hours	- 4 hours	-4
-3	- -	30 kph	Vslow	Short		- 6 hours	- 3 hours	-3
-2	- -	50 kph	Slow	Medium		- 4 hours	- 2 hours	-2
-1	- -	100 kph	Standard	Long		- 2 hours	- 1 hour	-1
0	Token	300 kph	Cruise	Vlong	168 hours	no variation	no variation	0
+1	- -	500 kph	Fast	Distant		+ 2 hours	+ 1 hour	+1
+2	- -	700 kph	Vfast	VDistant		+ 4 hours	+ 2 hours	+2
+3	- -	1000 kph	Sonic	Orbit		+ 6 hours	+ 3 hours	+3
+4	- -	2000 kph	Ssonic	- -		+ 8 hours	+ 4 hours	+4
+5	Incredible	3000 kph	Hsonic	- -		+10 hours	+ 5 hours	+5
+6		5000 kph	Xhsonic					

*Good Flux.

Typical Jump takes 168 hours plus or minus some value

7 TYPICAL MODS-7

Flux-	- Emotional	Degree	Potential	Brand Names	Anglic Brand Names	Vilani Brand Names	- MegaCorps	- -	Flux
-5	Distress	Utmost	Terrible	Loamer	Glump	Naa	General		- 5
-4	Hate	Extreme	Extremely Bad	Sloeph	NNA	Kakna	GsbAg		- 4
-3	Fear	Major	Very Bad	Cerlan	Peerless	Seleni	Delgado		-3
-2	Surprise	Significant	Bad	Boron	Consolidated	Lanuur	Hortalez		-2
-1	Unease	Minor	Poor	Neol Bros	Dorado	Khush	SuSAg		-1
0	Blank	Trivial	Ordinary	Engolia	Acme	Ushum	Makhid		0
1	Calm	Minor	Possible	Kosinar	Ponii	Ganun	Zirunkarish		+1
2	Surprise	Significant	Good	JPG	Golden	Shakashdir	Sharurshid		+2
3	Courage	Major	Very Good	Vereos	Official TAS	Sebiilem	Naasirka		+3
4	Love	Extreme	Extremely Good-	Tyxagon Corp	Iridium	Agbar Urdim	LSP		+4
5	Delight	Utmost	Wonderful	Starling	715 Corp	Karak	Instellarms		+5

8 TYPICAL MODS-8

Flux-	- TL Low	TL High	TL Vhigh	TL Extreme	- -	Multiples	Noise	- -	Flux
-5	TL 0	TL 5	TL A	TL N	- -	- -	Crowd Noise	- -	-5
-4	TL 1	TL 6	TL B	TL P	- -	- -	- -	- -	-4
-3	TL 2	TL 7	TL C	TL Q	- -	- -	Background Noise	- -	-3
-2	TL 3	TL 8	TL D	TL R	- -	- -	- -	- -	-2
-1	TL 4	TL 9	TL E	TL S	- -	- -	Distractions	- -	-1
0	TL 5	TL A	TL F	TL T	- -	Individuals	Normal	- -	0
1	TL 6	TL B	TL G	TL U	- -	Groups	- -	- -	+1
2	TL 7	TL C	TL H	TL V	- -	Hundreds	Quiet	- -	+2
3	TL 8	TL D	TL J	TL W	- -	Thousands	- -	- -	+3
4	TL 9	TL E	TL K	TL X	- -	10,000	Concentrating	- -	+4
5	TL A	TL F	TL M	TL Y	- -	100,000	- -	- -	+5

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Many of the Mods on these tables represent a human standard (for temperature, sound, or other effects). Non-human effects may be different.

Master Mods Tables

- -Modifications (Mods) indicate a deviation from the norm or standard. Mods can be determined with Flux from the tables, or they can be selected as appropriate by the referee.

MODS

9 TYPICAL MODS-9

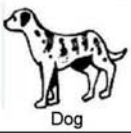
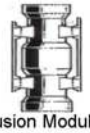
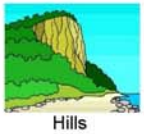
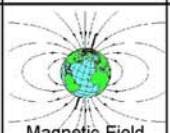
Flux-	- - -Careers	- -	- -	- -	Good/Evil	Order/Chaos-	Sounds	- -	Flux
-6	Citizen								
-5	Scholar	- -	- -	- -	Chaotic	Evil	- -	- -	-5
-4	Entertainer	- -	- -	- -	Chaotic	Evil- - -	- -	- -	-4
-3	Craftsman	- -	- -	- -	Chaotic	Evil - -	- -	- -	-3
-2	Scout	- -	- -	- -	Chaotic	Evil- - - -	Earpiece	- -	-2
-1	Merchant	- -	- -	- -	Neutral	Neutral - - -	Whisper	- -	-1
0	Spacer		- -	- -	Neutral	Neutral -	Talking	- -	0
1	Soldier	- -	- -	- -	Neutral	Neutral- -	Lecture	- -	+1
2	Agent	- -	- -	- -	Orderly	Good- - - -	Shout	- -	+2
3	Rogue	- -	- -	- -	Orderly	Good- - - -	Distress	- -	+3
4	Noble	- -	- -	- -	Orderly	Good - - -	Many In Distress	- -	+4
5	Marines	- -	- -	- -	Orderly	Good -	Gunshot	- -	+5
+6	Functionary						Thunder		+6

10 TYPICAL MODS-10

Flux-	-Gravity*	Acceleration*	Hostile Environ*	Zero-G*	BTSD Wound*	Damage*	Protection Mods**	Action Mods**	Flux
-6					Disastrous (6D)	Near Total (6D)			
-5	Crushing	Crushing	Chaotic	Chaotic	Very Heavy (5D)	Very Heavy (5D)	- -	- -	-5
-4	Extreme	Extreme	Disorienting	Disorienting	Heavy (4D)	Heavy (4D)	- -	- -	-4
-3	Crippling	Crippling	Disrupting	Disrupting	Common (3D)	Common (3D)	- -	- -	-3
-2	VStrong	VStrong	Swirling	Fluxing	Light (2D)	Light (2D)	- -	- -	-2
-1	Strong	Strong	Bothersome	Abnormal	Slight (1D)	Surface (1D)	- -	- -	-1
0	Normal	Normal	Normal	Normal	Scratch (1 pt)	Scratch (1 pt)	Typical	Typical	0
1		- -	- -	- -	- -	- -	Lt Armor	Evade	+1
2		- -	- -	- -	- -	- -	Armored		+2
3		- -	- -	- -	- -	- -	Hvy Armor		+3
4		- -	- -	- -	- -	- -	- -	- -	+4
5		- -	- -	- -	- -	- -	- -	- -	+5
+6									+6
	* Bad Flux	* Bad Flux	*Bad Flux	*Bad Flux	*Bad Flux	*Bad Flux	**Good Flux	**Good Flux	

The Mods shown in these tables are typical for inclusion in tasks. When the Referee knows an appropriate descriptor, these tables show the corresponding Mod. On the other hand, if the Referee does not know the proper descriptor, or has no preference, then he or she can roll Flux on an appropriate column or columns to determine the Mods.

Many of the Mods on these tables represent a human standard (for temperature, sound, or other effects). Non-human effects may be different.

Range	VISION	HEARING	Mass	Electric	Magnetic	Life	Thought
			AWARENESS			PERCEPTION	
0 Contact	Not Possible						
(=1) R Reading 0.5 m	 Needle	 Whisper	 Coin			 Flea	
(=1) T Talking 1.5 m	the Printed Word	 Talking	 Cards			 Moth	
1 Vshort 5 m	 Coin	 Lecture	 Book	 Chips	 Magnet	 Bird	
2 Short 50 m	 Cards	 SHOUT	 Suitcase	 Low Energy Devices	 Pistol	 Rat	*Calm Life Processes*
3 Medium 150 m	 Book	 ! Distress	 Person	 Wiring	 Rifle	 Dog	*Complex Life Processes*
4 Long 500 m	 Suitcase	 ! ! ! Distress	 Truck	 Fusion Modules	 Metal Devices	 Man	*Simple Thought*
5 Vlong 1000 m	 Person	 Gunshot	 Building	 Generators	 Truck	 Bison	*Complex Thought*
6 Distant 5000 m	 Truck	 Thunder	 Hills	 Transmission Lines	 Building	 Hexaphant	*Strong Emotion*
Horizon							
7 Vdistant 50 km	 Tower	 Massive Explosion	 Mountain	 Lightning Strike		 Leviathan	*Death Throes*
8 From Orbit 500 km	 City	Not Possible		 EMP		 Forest	*Death Throes*
8 In Orbit 500 km		Not Possible		 Massive EMP	 Magnetic Field		*Death Throes*

The Senses

The senses feed information to a character. In most cases, the process is assumed and invisible to the players. In some cases, the use of the senses is resolved:

To resolve some sensory activities (as actions) where the result is uncertain.
To show the distinct sensory abilities of different sophonts.

The sense rules provide to players an understanding of what information they can readily find through their senses, as well as showing how likely they are to be successful. Can this character smell something strange on the wind? Can that character see some movement on the horizon? Can another character hear a faint conversation across a room? Each of these situations may happen in the course of an adventure and the outcome inevitably shapes the actions of the characters.

THE SENSES

A being perceives the environment through the senses. Each single sense concentrates on one specific phenomenon: there are six broad types of phenomena that the senses can perceive.

The six broad categories for senses are:

Energy. The detection of energy is **vision**. The energy detected is typically wavelengths of light (which may extend into the infrared or ultraviolet).

Vibration. The detection of vibration is **hearing**. The vibration detected is sound (which may be ordinary sound, infrasonic, or ultrasonic).

Matter. The detection of matter is **touch**. Touch involves contact with objects and sensing of patterns, textures, shapes, temperature, and other information.

Volatiles. The detection of chemical (or biochemical) volatiles is smell (in atmosphere); or taste (in solution; typically water). The two are treated as one sense.

Fields. The detection of fields is awareness. The fields detected are electrical or magnetic.

Auras. The detection of auras is perception. The auras detected are biological (and reflect the presence of life), or sentient (and reflect the presence of thought).

Other senses are certainly conceivable, but they are either minor in scope or too exotic in resolution for this system to handle. When they are present, they are administered as exceptions or through special rules.

THE SIX BASIC SENSES

Phenomenon	Sense	Detects	Organ
Energy	Vision	Light	Eyes
Vibration	Hearing	Sound	Ears
Volatiles	Smell	Chemicals in gases	Nose
	Taste	Chemicals in liquids	Mouth
Matter	Touch	Physical objects	Body
Fields	Awareness	Electrical Magnetic	Nerve Grid
Auras	Perception	Biological (Life) Sentient (Thought)	Brain

SENSE ACTIONS

The Senses are resolved as Actions (an Action is expressed like a Task, but no specific Skill is involved). Two types of Action are possible: At Range, and In Contact.

At Range. When senses operate at a distance (Vision, Hearing, Awareness, Perception), the Action takes account of Range by using D6 equal to the range number (Vshort=1, Short =2, etc and a range table is provided).

Resolving a Vision Action at Range=2 uses 2D.

In Contact. When senses operate in contact (Touch, Smell), range is ignored and the Action is based on 2D.

THE SENSORY ACTIONS

Energy Vision	*Vibration* Hearing	*Volatiles* Smell	*Matter* Touch	*Fields* Awareness	*Life/Thought* Perception
To Spot	To Notice	To Notice	To Notice	To Notice	To Notice
--	To Locate	--	--	To Locate	To Locate
To Identify	To Identify	To Identify	To Identify	To Orient	To Identify
To Track	To Track	To Follow	--	To Track	To Track

Spot (for Vision) or **Notice** (all others) indicates that the individual has picked out the sensory input and is able to further process it. Additional actions are not possible unless an input is spotted or noticed first.

Locate provides the individual with the location (direction and approximate distance) to the source.

Identify provides the individual with information about what the source is (for Hearing it also allows comprehension). **Orient** provides the individual with information about surroundings.

Track allows the individual to observe the source as it moves. **Follow** allows the individual to move toward the object.

THE REFEREE VERSUS THE CHARACTER

There are two important elements in the use of the senses:

Use the Senses Only When Necessary

Events become bogged down when every glance is resolved with Vision, or every noise is resolved with Hearing. Use the senses only when the ability to sense something is unclear or unusual.

Conceal The Input Until it Is Sensed

Techniques are available that allow the Referee to conceal what he knows.

The Referee. The Referee has perfect knowledge about the situation. He knows if there are soldiers lying in ambush, or faint markings on stone walls. Or, he knows that the present location is harmless.

The Players. The players have no readings from their senses to understand the situation. Some information is obvious: the referee should describe what they normally see or hear or sense. Other information may be uncertain, and the use of the senses is called for.

The Process. The Sense Process is the way characters investigate their surroundings.

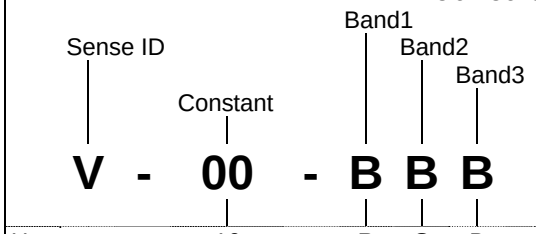
The Senses

The Sense Actions provide information about the environment.

The Senses
An Overview of Their Use

V =VISION

Human Vision Constant **16**

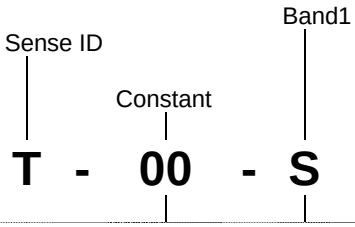


Human=	16	R	G	B

nD To Notice an Object
< Constant + Benchmark + Mod + Mod

T =TOUCH

Human Touch Constant **06**

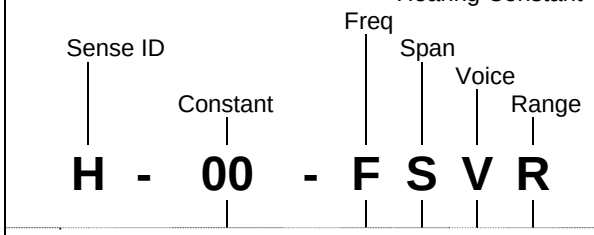


Human=	06	1

2D To Notice a Texture
< Constant + Benchmark + Mod + Mod

H =HEARING

Human Hearing Constant **16**

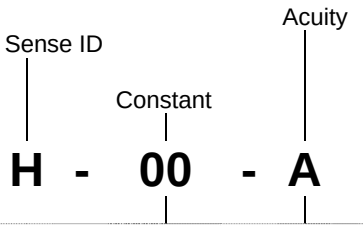


Human=	16	9	3	8	2

nD To Notice a Sound
< Constant + Benchmark + Mod + Mod

A =AWARENESS

Human Aware Constant **X**

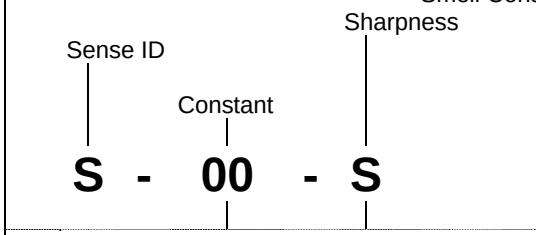


Human=

nD To Notice a Field
< Constant + Benchmark + Mod + Mod

S =SMELL

Human Smell Constant **10**

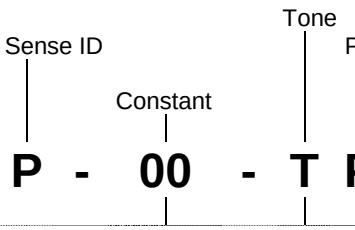


Human=	10	1

2D To Notice a Scent
< Constant + Benchmark + Mod + Mod

P = PERCEPTION

Human Perception Constant **X**



Human=

nD To Notice an Aura
< Constant + Benchmark + Mod + Mod

RANGES

Range=	0	1	2	3	4	5	6	7	8	9
Range	Contact	Vshort	Short	Medium	Long	Vlong	Distant	VDistant	Orbit	Far Orbit
Distance		5 m	50 m	150 m	500 m	1000 m	5000 m	50 km	500 km	5000 km

Range	VISION
0 Contact	Not Possible
R Reading 0.5 m	 Needle
T Talking 1.5 m	the Printed Word
1 Vshort 5 m	 Coin
2 Short 50 m	 Cards
3 Medium 150 m	 Book
4 Long 500 m	 Suitcase
5 Vlong 1000 m	 Person
6 Distant 5000 m	 Truck
Horizon	
7 Vdistant 50 km	 Tower
8 From Orbit 500 km	 City

Vision

Vision senses light (radiant energy). Photons emitted by, or reflected by, objects provide information about the objects.

Vision-1

UNDERSTANDING VISION

The sense organ for vision is the **eye**. It detects radiant energy and feeds it to a nerve system that processes the information. A sophont's eye is sensitive to a range of light wavelengths (bands) which correspond to colors.

A sophont with a sense of vision has **eyes** and can **see**. A sophont without the sense of vision is **blind**.

V =VISION — Human Vision Constant **16**

Sense ID | Constant | Band1 | Band2 | Band3

V - 00 - B B B

Human=	16	R	G	B

nD To Notice an Object
< Constant + Benchmark + Mod + Mod

Range. Roll Dice equal to Range.

Vision. The Vision Constant for the Race (Human = 16). Higher numbers are better: a sophont with Vision 20 has better vision; one with Vision 12 has worse vision.

Benchmark. Object Size minus Range. If zero or less, the Action cannot be attempted.

Mods. Mods based on circumstances from the Master Mods table (as applicable). Higher Mods are better.

THE VISION CONCEPT

The Vision Action is the referee's opportunity to present sense information to a character. When the character indicates he is trying to see what he can ("I am scanning the horizon" or "I am looking around"), the referee resolves the Vision Action based on the Vision Constant, Range, Object Size, and other details.

Once an object is noticed, the character continues to see it until it moves out of range or somehow becomes hidden.

For example, human Eneri Dinsha V-16-RGB has landed his scoutship on a broad plain. He steps out and looks around. It is ordinary daytime.

There is a cargo mover Size=6 moving near the horizon Range=6.

Vision Constant = 16. Benchmark = Size minus Range = 6-6 = 0. Mod = +2 Vfast.

The referee hands the player 6D and says "Roll." He must roll 16 +0 + 2 = 18 or less on 6D to notice the cargo mover. He has about a 28% chance of seeing it.

Option1. Eneri rolls 12. The referee tells him: "There is a Cargo Mover out near the horizon, moving from left to right, appears to be moving quite fast.

Option2. Eneri rolls 21. The referee tells him: "The landscape looks fairly common. Some flats, a few rocks, some hills off in the distance." He's probably not looking very hard.

Eneri can go back inside because there's nothing to see.

Or he can keep looking and try again.

More About Vision

- Vision senses a variety of light wavelengths.

Vision-2

THE COLORS OF LIGHT

The Vision String identifies three adjacent Bands: named adjacent peak wavelengths corresponding to colors. Vision detectable wavelengths (defined in nm nanometers) range from the ultraviolet to the infrared across a spectrum of sixteen colors.

Humans see in RGB (Red-Green-Blue); others may see a spectrum which overlaps human vision (for example, PBG, or RCA), or a spectrum above or below the human range.

Subjective Color. A being "sees" a range of colors analogous to RGB. Someone with vision in the PSU (Purple-Sparkle-Uv) band "sees" P as Red, S as Green, and U as Blue).

Seeing Colors

Objects reflect (or radiate) many different colors; beings can only see the colors their eyes can sense. Colors convey information; beings seeing different wavelengths harvest different information from what they see.

Seeing White. A white object reflects all colors. A human seeing RGB sees a white object. A sophont seeing PSU also sees a white object.

Seeing Black. A black object reflects no colors. A human seeing RGB sees a black object. A sophont seeing PSU also sees a black object.

Seeing Heat. A sophont who sees in the InfraRed (any of the colors ANIFXZ) can see objects hotter than its body temperature as bright glowing ANIFXZ colors and those colder as dull grey or black regardless of light levels. In addition, the sophont can see ordinary objects in reflected ANIFXZ colors.

AN OVERVIEW OF COLORS

nm	Code	Name	Star	Extended Color Name
30	V	Vharduv	B0 I	Very Hard Ultra Violet.
100	H	Harduv	B0 V	Hard Ultra Violet.
170	D	Darkuv	B5 V	Dark Ultra Violet.
240	U	Uv	B9 V	Ultra Violet.
310	S	Sparkle	A2 V	Near Ultra Violet.
380	P	Purple	A9 V	Human visible Violet (almost ultraviolet).
450	B	Blue	F7 V	Human visual Blue.
540	G	Green	G2 V	Human visible Green.
610	R	Red	K1 V	Human visible Red.
680	C	Cerise	K4 V	Human visual Cerise (almost infrared)
750	A	Aglow	K7 V	Edge of infrared.
820	N	Nearir	M0 V	Near Infra Red
890	I	Ir	M2 V	Infra Red
1000	F	Farir	M5 V	Far Infra Red
2000	X	Xir	L9 VII	Extreme Infra Red
4000	Z	Zir	T7 VII	Beyond Extreme Infra Red

nm: the wavelength in nanometers (nm). The peak wavelength perceived; the eye actually sees wavelengths within 100 nm on either side of the peak (more in the Infrared). **Code.** The single letter abbreviation for this color.

Name. The name of this color. **Star.** Stellar spectral class with peak output at this wavelength. **Extended Color Name.** A description of this color.

IT'S MORE COMPLEX THAN THESE FEW STATEMENTS

The equivalence of colors across wavelengths is far more complex than these few statements. For role-playing purposes, a player can assume the equivalences for everyday usage can concentrate on the differences.

THE ADVANTAGES OF OTHER COLORS

A sophont with vision in the infrared can see heat: hotspots in machinery; body heat from animals or sophonts, even in the darkest night; heat traces left by vehicles.

A sophont with vision in the ultraviolet can see fluorescing minerals, chemicals left by organic activity.

Vision in other colors can often detect flaws, document alterations, or overpainting not visible to the original users.

THE DISADVANTAGES OF COLOR

Devices may show blank output: in colors invisible to the user.

Insignia, markings, color identifiers, warning signs, or alarms may be in invisible colors.

TECHNOLOGICAL VISION

Many devices depend on light input, produce light output, and operate to enhance vision.

A Vision device is identified with a Vision String and may include an enhanced Vision Constant, a Range Mod, and alternate color input and output.

An unaided human V-16-RGB has a 40% chance of noticing a person Size = 5 at R=5.

Binox-10 V-20-VHD> RGB is a TL-10 vision enhancer seeing in the VHD range and outputting in human-visible RGB. Constant 20 increases the chance of success.

A human using Binox-10 V-20-VHD has a 78% chance of noticing a person Size = 5 at R=5.

Binox-12 V-16-RGB R-1 is a TL-12 vision enhancer seeing in the RGB range. R-1 reduces the applicable range band by 1.

A human using Binox-12 V-16-RGB BM+1 has a 40% chance of noticing a person Size=5 at Range=6 (resolved as R=5).

Range	HEARING
0 Contact	
R Reading 0.5 m	Whisper
T Talking 1.5 m	Talking
1 Vshort 5 m	Lecture
2 Short 50 m	SHOUT
3 Medium 150 m	! Distress
4 Long 500 m	! ! ! Distress
5 Vlong 1000 m	 Gunshot
6 Distant 5000 m	 Thunder
Horizon	
7 Vdistant 50 km	 Massive Explosion
8 From Orbit 500 km	Not Possible

Hearing

Hearing senses vibration of matter in atmosphere. The motion of objects induces vibration in atmospheric gases (or in water) and this vibration provides information about motion and location.

Hearing-1

UNDERSTANDING HEARING

The sense organ for hearing is the ear. It takes in vibration and feeds it to a nerve system that then processes the information. Typically, the ear is sensitive to a range of frequencies which correspond to sound pitch.

A sophont with the sense of hearing has **ears** and can **hear**. A sophont without the sense of hearing is **deaf**.

H =HEARING — Human Hearing Constant **16**

Sense ID	Constant	Freq	Span	Voice	Range
H -	00 -	F	S	V	R
Human=	16	9	3	8	2

Sound Benchmarks

Earbud	-2
Whisper	-1
Talking	0
Lecture	+1
Shout	+2
Distress	+3
Distress Many	+4
Gunshot	+5
Thunder	+6
Explosion	+7

nD To Notice a Sound < Constant + Benchmark + Mod + Mod

Range. Roll Dice equal to Range. Treat Range=R and Range=T as Range=1.

Hearing. The Hearing Constant for the Race (Human = 16). Higher numbers are better; a sophont with Hearing 20 has better hearing; one with Hearing 12 has worse hearing.

Benchmark. Sound Intensity minus Range. A benchmark less than zero can still be attempted.

Mods. Mods based on circumstances from the Master Mods table (as applicable). Higher Mods are better.

THE HEARING CONCEPT

The Hearing Action is the referee's opportunity to present sense information to a character. When the character indicates he is trying to hear what he can ("I am listening" or "I am trying to hear any unusual noises"), the referee resolves the Hearing Action based on the Hearing Constant, Range, Object Size, and other details.

The referee may also introduce information (when an unusual sound happens, he gives the player an opportunity to hear it through the Hearing Action).

Once a sound is noticed, the character continues to hear it until it ends.

For example, human Eneri Dinsha H-16-9382 is relaxing in the Lone Star with his friends. They notice two uniformed human naval officers talking to each other. Eneri's friend whispers "Sh! Listen to those officers. Can you hear what they are saying?"

The officers are Talking. Their table is close by: Range=1.

Hearing Constant= 16. Benchmark = Sound minus Range = 0 - 1 = -1. The room isn't crowded, and relatively quiet. Mod= 0. He must roll 16 -1 = 15 or less on 1D to listen to the conversation. He rolls 6. After a while, the officers notice and stop talking.

Or, the room is crowded and noisy. Background Noise Mod= -12. He must roll 16-1-12 = 3 or less on 1D. He rolls 5, and can't make out anything.

Outside, it starts to rain.

There is a clap of thunder about a kilometer away. Hearing Constant= 16. Benchmark = Sound Minus Range = 6 - 5 = +1. The Lone Star has background noise = -3.

The player rolls 5D. He must roll 16 +1 -3 or less on 5 D. He rolls 22 and doesn't notice the noise outside.

Later they step outside and notice its raining. There's another clap of thunder. It's obvious; there's no need to roll. They hear the thunder.

More About Hearing

Hearing senses sound frequencies.

Hearing-2

THE FREQUENCIES OF SOUND

The Hearing String identifies the sound frequencies (pitch) which a sophont can hear, and the sound frequencies of the sophont voice.

F Freq. The central frequency the ear can hear in Hertz (= cycles per second). F is a power of 2 (so, if F=8, Freq = 2^8 = 256). The difference between any two Freq values is an Octave.

S Span. The number of Octaves above and below Freq. If S=1, then the span of sound the sophont can hear is one octave above and below Freq.

V Voice. The central frequency of the voice in Hertz.

R Range. The number of Octaves above and below Voice.

THE FREQUENCIES OF SOUND

Flux	Code	Freq (Hz)	Formula		Description
-9	1	2	2^ 1	C d	delta
-8	2	4	2^ 2	C th	theta
-7	3	8	2^ 3	C a	alpha
-6	4	16	2^ 4	C 0	beta
-5	5	32	2^ 5	C 1	gamma
-4	6	64	2^ 6	C 2	Low human audible.
-3	7	128	2^ 7	C 3	
-2	8	256	2^ 8	C 4	Middle C
-1	9	512	2^ 9	C 5	
0	A	1,000	2^10	C 6	
+1	B	2,000	2^11	C 7	
+2	C	4,000	2^12	C 8	High human audible.
+3	D	8,000	2^13	C 9	
+4	E	16,000	2^14	C10	Dog whistle
+5	F	32,000	2^15	C11	
+6	G	64,000	2^16	C12	
+7	H	128,000	2^17	C13	
+8	J	256,000	2^18	C14	
+9	K	524,288	2^19	C15	

Pitch is sound frequency (in Hertz; in cycles per second). Each increase in pitch is twice the frequency of the previous level and equals one octave.

Calculating What Sounds Can Be Heard

Human Hearing is H-16-9392.

Frequency =9. Human hearing is centered on Frequency =9 = 2^9 cycles per second = 512 hertz. This corresponds to C5 on the Musical Pitch Chart.

Span = 3. Human hearing extends 3 octaves above and below the central Frequency. A human can hear sounds from 2^6 (= 64) Hz to 2^12 (= 4000) Hz.

Voice= 9. The human voice is centered on Voice= 9 = 2^9 cycles per second = 512 hertz. This corresponds to C5 on the Musical Pitch Chart (the Human male voice is one octave lower).

Range = 2. The human voice extends 2 octaves above and below the central Voice frequency. A human can make sounds from 2^7 (= 128) Hz to 2^11 (= 2000) Hz. The Human Male is about one octave lower.

SPECIAL SOUNDS

Some frequencies of sound have additional effects outside of the sense of hearing (they have no effect on sophonts who hear the Frequency naturally).

F=1. Delta Waves. Induces or promotes sleep. After 5 minutes of exposure, Check C3: Failure = Character falls asleep for 1D minutes the first time; 1D hours the second time.

F=2. Theta Waves. Induces hypnotic or trance suggestive states. After 5 minutes, a Personal against the subject may include Mod = Good Flux.

F3. Apha Waves. Induces relaxation states. After 5 minutes, the subject is Sleepy.

F=4. Beta Waves. Induces alertness. After 1 minute of exposure, subject is Ordinary for 1 hour, followed by a return to previous attention level.

Many alarms include output at F=4 (overuse checks San).

F=5. Gamma Waves. Induces heightened productivity. After 5 minutes, subject is Optimal for 1 hour, followed by a return to previous attention level.

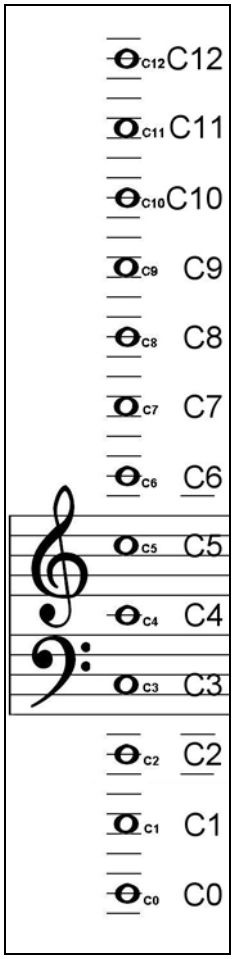
TECHNOLOGICAL HEARING

Many devices input, process, and output sound. A Hearing Device is identified with a Hearing String and may include an enhanced Hearing Constant, a Rang Mod, and alternate sound input and output.

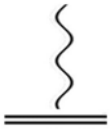
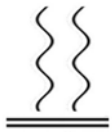
Player-8 H-16-0093 is a TL-8 sound entertainer reproduces sound in the human hearing range.

Comm-9 H-16-9090 R=5 inputs and outputs sound (with a tinny quality) and communicates with similar communicators to Range=5.

MUSICAL PITCH



Musical Pitch. Pitch is most understandable in a musical format. The pitch levels shown correspond to musical C (Middle C= 256 Hertz). The typical human male voice centers on C4 or Middle C; the typical human female voice centers on C5.

Range	SMELL
0 Odorless	
1 Slight	
2 Aromatic	
3 Strong	
4 Intense	
5 Over-whelming	

Smell

Smell senses volatile molecules. Objects emit molecules through evaporation, fragmentation, or combustion, and the types of molecules provide information about objects.

Smell-1

UNDERSTANDING SMELL

The sense organ for smell is the nose. It gathers molecules in the environment and feeds it to a nerve system that processes the information. In addition, some smells (pheromones) create automatic direct responses that bypass the consciousness.

A sophont with the sense of smell has a nose and can smell. A sophont without the sense of smell is smellblind or anosmic.

Smells may original far away; they are senses based on their intensity at the nose (the sensing location)

S =SMELL — Human Smell Constant **10**

Sharpness

Sense ID

Constant

S - 00 - S

Human= 10 2

Smell Intensity	
Odorless	0
Slight	+1
Aromatic	+2
Strong	+3
Intense	+4
Overwhelming	+5

Sharpness Mods	
Second Digit	-2
Third Digit	-3
Fourth Digit	-4
Fifth Digit	-5
Sixth Digit	-6

2D To Notice a Scent
< Constant + Benchmark + Mod + Mod

Range. Roll 2D.

Smell. The Smell Constant for the Race (Human = 10). Higher numbers are better.

Benchmark. Smell Intensity. If zero, there is no smell to be sensed.

Adjust and Comment. Mods based on circumstances from the Master Mods table (as applicable). Higher Mods are better.

THE UNIVERSAL ODOR PROFILE

Differentiator 1 (also Gender)
Differentiator 2 (also Caste)
Overtone

S1 S2 S3 S4 S5 S6

9 A B - 5 6 7

Primary Smell
Differentiator 3 (also Pheromone)
Nuance

The Universal Olefactory Profile identifies Scents. The first three digits (PON) identify the smell of the Scent. The next three digits (GCE) identify the effects of the Scent.

Sharpness is the ability to identify increasingly subtle elements of smell, and the number of digits in the Universal Odor Profile which a sophont may try to identify.

Noticing a Scent provides the first digit in the UOP.

The character may try again to sense the additional digits in the UOP subject to Sharpness and Sharpness Mods, stopping when a failure occurs.

Sharpness is the maximum number of digits in the UOP that the individual can try to sense.

THE SMELL CONCEPT

The Smell Action is the referee's opportunity to present sense information to a character. When the character indicates he is trying to smell what he can ("I am sniffing" or "I am trying to smell anything"), the referee resolves the Smell Action based on the Smell Constant, Intensity, and other details.

Once a smell is noticed, the character continues to be aware of it as necessary.

For example, human Eneri Dinsha S-08-1 steps out of his scout ship.

There is a forest fire upwind, but out of sight. The smell intensity at Eneri's location is Slight = 1.

Smell Constant = 10. Benchmark = Intensity = +1. There are no Mods.

The referee hands the player 2D and says "Roll." He must roll 10 +1 = 11 or less on 2D to scent of forest fire in the air.

More About Smell

Smells are atmosphere or water-borne volatile chemicals and biochemicals.

Smell-2

THE DETAILS OF SMELL

The characteristic smell of a Scent consists of its Primary Smell, an Overtone, and a Nuance (together PON). Taken together, these three digits define the smell of a Scent and how it is perceived by the individual.

A Scent is a characteristic of the substance that emits it. The Scent of a chemical or being indicates that the chemical or being is present (or was recently present).

The Racial Characteristic Scent. Each Race has its own characteristic Scent (as indicated on the Being Creation Card and on the Character Card) expressed a PON. Beings of the Race emit (in greater or lesser amounts) a characteristic Scent with the same initial PON. The Scent is further refined by the individual. All members of a specific Gender emit the same G; if there is caste, those of the same caste emit the same C (otherwise the C emitted is random). Individuals emitting pheromones emit them as E (otherwise, the E emitted is random).

Intensity. A scent has a base Intensity at its origin, and reduces in strength with distance from its origin (usually 1 level per 1 or 2 Range Bands).

Identifier

Most Scents have no effect other than as a marker. Some have specific effects.

Gender Identifier. Each Race includes in its definition Gender Identifiers for each Gender. When the Smell of a Scent has been identified, the individual also knows the Gender Identifier (if present and applicable).

Caste Identifier. Each Race includes in its definition Caste Identifiers for each Caste (if the Race has Caste). When the Smell of a Scent has been identified, the individual also knows the Caste Identifier (if present and applicable).

If the Race does not have Caste, this digit has no apparent or obvious meaning.

Substance Effects

The substance which a Scent identifies may have its own effects (which are independent of the Scent). For example, the Scent of smoke indicates a fire nearby. These effects are independent of the Scent.

Respiratory Effects

A Scent with a numeric GC (any numbers from 01 through 99) has a negative respiratory effect when breathed, and equal to 1 hit per digit times Intensity. Intensity-1 scent ABC-95A inflicts Poison-2. Intensity-5 scent ABC-00K inflicts Poison-10.

PSEUDOMONES

Some Scents may mimic Pheromones based on similarities in the PON.

Strong Pseudomone. A Scent PON with the same three Digits (in any order) as the Racial PON. For Race PON= ABC, BCA and BAC are Strong Pseudomones).

Equivalent Pseudomone. A Scent PON with two of its Digits the same (in any order) as the Racial PON. For Race ABC, AYC and C4B are Equivalent Pseudomones.

Faint Pseudomones. A Scent PON with two identical digits which are contained in the Racial PON. For Race PON= ABC, AAT and CCN are Faint Pseudomones.

Pseudomone Effects

A Pseudomone takes its effect from the sixth digit E regardless of other digits in GCE (see the Pheromone table). Equivalent operates at full strength; Strong operates at Double Strength; Faint operates a Half Strenth.

PHEROMONES

A variety of pheromones exist, although they are not necessarily produced by individuals.

The Pheromone Marker. A Scent with a Racial PON and GC=00 is a pheromone with an effect determined by E below. It exerts its effects only on the race identified by PON.

THE PHEROMONE CATALOG

Code	Value	Descriptor	Character
1	1	blank	
2	2	blank	
3	3	blank	
4	4	blank	
5	5	blank	
6	6	blank	
7	7	blank	
8	8	blank	
9	9	blank	
A	10	blank	
B	11	Trail Marker	
C	12	Alarm	
D	13	Opposite Gender Attractor	
E	14	Fear	
F	15	Repellant	
G	16	Soother	
H	17	Gender Balancer	
I	18	Gender Determiner	
J	19	Caste Balancer	
K	20	Caste Determiner	
L	21	Gender Change Trigger	
M	22	Caste Change Trigger	
N	23	Blinder	
O	24	Deafener	
P	25	Smell Blinder	
Q	26	Royalty Marker	
R	27	Universal Compeller	
S	28	Dread	
T	29	Courage	
U	30	Shun	
V	31	Berserk	
W	32	Scatter	
X	33	Paralyze	
Y	34	Freeze	
Z	35	Rally	
0	36	Undefined	

Pheromones impose a variety of effects on the subject based on the Descriptor.

	TOUCH
Hand	
Paw	
Tentacle	
Gripper	
Grasper	
Socket	

Touch

Touch senses direct contact with objects. The pressure of contact (and other details: temperature, texture) provides information about objects.

Touch-1

UNDERSTANDING TOUCH

The sense organ for touch is the skin in general, but specifically manipulators (hands for humans; other manipulators for other sophonts). They feel contact with objects and feed the information to the nervous system.

All sophonts have a sense of touch.

T =TOUCH — Human Touch Constant **06**

Sense ID — Constant — Sensitivity

T - 00 - S

Human=	08	2

Textures

Xfaint	-4
Vfaint	-3
Faint	-2
VSmall	-1
Small	0
Grooved	+1
Coarse	+2
Rough	+3
Very Rough	+4

2D To Notice a Texture
< Constant + Benchmark + Mod + Mod

Range. Roll Dice equal to Range.

Touch. The Touch Constant for the Race (Human = 08). Higher numbers are better; a sophont with Touch 20 has better touch sensitivity; one with Touch 04 has worse.

Benchmark. Object Texture.

Adjust and Comment. Mods based on circumstances from the Master Mods table (as applicable). Higher Mods are better.

Sensitivity. Sensitivity is the number of times the character may retry before deciding there is nothing of interest.

MANIPULATOR MODS

Manipulator	Grip Mod	Touch Mod
Hand	0	0
Paw	- 2	-1
Tentacle	+1	0
Grasper	0	-2
Gripper	+2	-1
Socket	- 1	-3

THE TOUCH CONCEPT

The Touch Action is the referee's opportunity to present sense information to a character. When the character indicates he is trying to feel a texture or a surface ("What does this surface feel like?" or "Are there any seams, or cracks?"), the referee resolves the Touch Action based on the Touch Constant, Sensitivity, and other details.

For example, human Eneri Dinsha T-06-3 is exploring the interior of a ruined structure. He runs his hand and fingers along a stone wall.

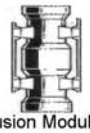
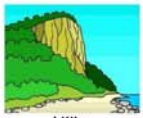
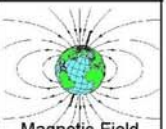
There are Faint carvings in the surface.

Touch Constant = 6. Benchmark = Faint = -2. Mods = 0.

The referee hands the player 2D and says "Roll." He must roll 6 - 2 = 4 or less on 2D.

Option1. Eneri rolls 12. The referee tells him: "There doesn't seem to be much there."

Option2. Eneri rolls 3. The referee tells him: "The surface feels like etched writing, strange writing, obscured by years of dirt."

Range	Mass	Electric	Magnetic
	AWARENESS		
0 Contact			
(=1) R Reading 0.5 m	 Coin		
(=1) T Talking 1.5 m	 Cards		
1 Vshort 5 m	 Book	 Chips	 Magnet
2 Short 50 m	 Suitcase	 Low Energy Devices	 Pistol
3 Medium 150 m	 Person	 Wiring	 Rifle
4 Long 500 m	 Truck	 Fusion Modules	 Metal Devices
5 Vlong 1000 m	 Building	 Generators	 Truck
6 Distant 5000 m	 Hills	 Transmission Lines	 Building
Horizon			
7 Vdistant 50 km	 Mountain	 Lightning Strike	
8 In Orbit 500 km		 Massive EMP	 Magnetic Field

Awareness

Awareness senses electrical and magnetic fields.

Aware-1

UNDERSTANDING AWARENESS

The sense organ for awareness is the nervous system. As a being moves within a field, the nervous system responds to the microcurrents which the field creates, and this information is processed by the brain (in much the way that the skin senses wind or radiant heat).

A sophont with the sense of awareness is aware. A sophont without the sense is unaware.

Awareness is an analog of Vision. When Awareness functions in association with Vision, the result is a form of Synthetic Vision. The brain maps its sensing of Mag and Lek to a three-dimensional metal visual image.

Full Circle Coverage. Awareness functions in all directions. As a result, awareness input is mapped to the beings mental image rather than to the sights seen by the eyes.

False Colors. Awareness is mapped to the mental image using mind generated false colors **Mag** and **Lek**. They are perceived as transparent colors which do not illuminate or reflect. They are perceived despite intervening objects (more or less). To the extent they are not absorbed or attenuated, they create a kind of xray vision.

A =AWARENESS Human Aware Constant **X**

Sense ID — Constant — Acuity

A - 00 - A

Human=

nD To Notice a Field
< Constant + Benchmark + Mod + Mod

Range. Roll Dice equal to Range.

Vision. The Aware Constant for the Race (Human do not have Awareness). Higher numbers are better: a sophont with Aware 20 has better awareness; one with Aware 12 has worse awareness.

Benchmark. Object Size minus Range.

Mods. Mods based on circumstances from the Master Mods table (as applicable). Higher Mods are better.

THE AWARENESS CONCEPT

The Awareness Action is the referee's opportunity to present sense information to a character. When the character is trying to sense what he can ("I am trying to sense anything unusual" or "I am concentrating on fields").

The Awareness Action is resolved. Once an object is noticed, the character continues to be aware of it until it moves out of range or somehow becomes hidden.

More About Awareness

Awareness senses electric and magnetic fields. By extension, it senses disturbances in those fields by various masses.

Aware-2

SENSING THE ETHER

Awareness senses the complex jumble of electrical and magnetic fields that pervade almost every environment.

Over evolutionary time, beings who have developed this sense of Awareness come to believe that what they sense is perturbations in the ether, the universal fluid which pervades all space.

In a sense, this understanding provides a working model for the understanding of how Awareness works. All of space is permeated by electrical and magnetic fields and individuals sense these fields and perturbations in them.

Awareness provides three types of sensory input.

Relative Direction. Awareness detects the background magnetic field of a world and allows the individual to instinctively know magnetic north (assuming the world has a magnetic field). A character takes about one sleep cycle for his body and sense to adjust to the new environment; thereafter, he unfailingly knows local directions.

Local Features. Massive objects (mountains, buildings, starships) distort local fields and thus register their presence. This is mapped to visual information as hazy, indistinct silhouettes observable even when visually obscured. Awareness senses mountains even when invisible because of forest, fog, clouds, or distance. It senses buildings even in darkness. Larger masses are sensed farther away; metals are more likely sensed than non-metals.

Electric and Magnetic Fields. Current flowing through wires is sensed as a glow of a specific color ("Lek") even behind walls or barriers (alternating current flickers or pulses). Magnetic objects are sensed as a glow of a different specific color ("Mag").

THE UNSEEABLE COLORS: MAG AND LEK

Code	Name	Character
L	Lek	Color associated with Electric Fields
H	Mag	Color associated with Magnetic Fields

Code. The single letter abbreviation for this color.
Name. The name of this color.
Character. Brief description of this color.

One of the great challenges to Aware artists is the reproduction in paint or pigment of the appearance of Lek and Mag.

For Example

For example, sophont Norhin Sakdili A-20-1 has landed his ship on a new world, its surface shrouded in mist. He is slightly disoriented: he has not yet developed a sense of direction on this world.

He has a general sense of massive objects, feeling the presence of a range of mountains beyond the horizon, and a vast sea in the distance.

Standing at the hatch of his ship, he is aware (behind him) of flickering Lek from the ship's alternating current circuits, and of scattered Mag glows from magnetic devices.

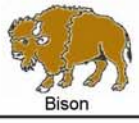
There is a storm near the horizon Range=6 and a flash of lightning Size=7.

Awareness Constant = 16. Benchmark = Size minus Range = 7 – 6 = +1.

The referee hands the player 6D and says "Roll." He must roll 20 +1 = 21 or less on 6D to notice lightning. He has a 55% chance of success.

Option1. Norhin rolls 12. The referee tells him: "You see a flash of Lek on the horizon." Norhin starts counting and at 18 the referee says, "You hear a distant clap of thunder." 18 / 3 = 6 km distant.

Option2. Norhin rolls 31. The referee tells him: "There doesn't seem to be much going on."

Range	Life	Thought
	PERCEPTION	
0 Contact	 Flea	Calm Life Processes
R Reading 0.5 m	 Moth	Complex Life Processes
T Talking 1.5 m	 Bird	Simple Thought
1 Vshort 5 m	 Rat	Complex Thought
2 Short 50 m	 Dog	Strong Emotion
3 Medium 150 m	 Man	Death Throes
4 Long 500 m	 Bison	Death Throes
5 Vlong 1000 m	 Hexaphant	
6 Distant 5000 m	 Leviathan	
Horizon		
7 Vdistant 50 km	 Forest	
8 From Orbit 500 km		

Perception

Perception senses auras surrounding life and intelligence.

Percept-1

UNDERSTANDING PERCEPTION

The sense organ for perception is the brain. Native brain structures detect auras associated with life and with intelligence directly and process the information.

Perception is an analog of hearing: a sophont "hears" the information that the perception sense provides overlaid by brain processes on whatever hearing input is available.

The sense organ for awareness is the nervous system. As a being moves within a field, the nervous system responds to the microcurrents which the field creates, and this information is processed by the brain (in much the way that the skin senses wind or radiant heat).

P = PERCEPTION Human Perception Constant **X**

Sense ID — Constant — Tone — PVoice

P - 00 - T P

Human=

nD To Notice an Aura
< Constant + Benchmark + Mod + Mod

Range. Roll Dice equal to Range.

Perception. The Perception Constant for the Race (Humans do not have Perception). Higher numbers are better: a sophont with Perception 20 has better perception; one with Perception 12 has worse perception.

Benchmark. Object Size minus Range.

Mods. Mods based on circumstances from the Master Mods table (as applicable). Multiple Thoughts or Emotions of the same type use the Multiples Mod. Higher Mods are better.

THE PERCEPTION CONCEPT

The Perception Action is the referee's opportunity to present sense information to a character. When the character indicates he is trying to sense what he can ("I am concentrating on life signs or thoughts" or "I am trying to sense anything ususual"), the referee resolves the Perception Action based on the Perception Constant, Range, Object Size, and other details.

Once an object is noticed, the character continues to see it until it moves out of range or somehow becomes hidden.

For example, sophont Sir Glibern Dashash P-24-33 is preparing for the evacuation of Efate, shredding files and destroying technical equipment. The Zhodani invasion is imminent.

A missile strike hits Windrose City, some 50 km away R=7. Thousands of people die in a matter of minutes = Multiple Death Throes = Size 8.

Perception Constant = 16. Benchmark = Size minus Range = 8 - 7 = +1. 100,000 victims = +5.

The referee hands the player 7D and says "Roll." He must roll 24 +1 +5 = 30 or less on 6D to notice the death throes. He rolls 24. He feels the pain of thousands of people dying. A couple minutes later, the building shakes and he hears a loud sound in the distance.

Personals

Characters routinely meet non-player characters and engage them for enjoyment, to gather information, to persuade them to do something (or to not do something), and even to command them to do something (or not do something).

Many Personals are automatic (following the general rule that, if the situation is trivial or unremarkable, there is no need to resolve or role-play it). When a non-trivial Personal arises, the player must decide the process and state it for resolution.

Why Not Just Role-Play? Personal situations are the essence of social interaction and they are perfectly suited for role-playing. The Personal system gives structure to the role-playing situation. Without a structure which gives options to the character, role-playing becomes an interaction between the personality of the player and the personality of the referee. The Personal system gives options to the player and gives structure to the role-playing response of the referee.

THE PERSONAL SITUATION

Personal interactions are governed by laws of behavior. Rarely can a character simply walk up to another and ask detailed questions and expect detailed answers, or give orders and expect them to be obeyed. When a character encounters and interacts with a non-player character, the player must consider the purpose of the encounter, its goal, and adopt strategies to help accomplish that goal.

HOW THIS WORKS

A Personal Situation is a role-playing situation which allows a character to interact realistically with a non-player character. It proceeds through several escalating steps based on the intentions of the character (the Actor) ands the responses of the non-player character (the Target).

RESOLVING A PERSONAL

Purpose	__ D	Select a Purpose. Purpose determines the number of dice to be rolled.
Strategy		Select a Strategy. Strategy provides a Base Point Value.
Tactic	x __	Select a Tactic to implement the Strategy. Some tactics are inappropriate.
Laws		Apply the best applicable Law to create a Mod.
Mod1		Apply up to two Mods, as available.
Mod2		
Target No. =		Roll the dice specified by Purpose against the Target Number.

The values create the Target Number; the dice are rolled, compared and success of the Personal is determined. Failure terminates the Personal (subject to Please Reconsider). Success allows the Personal to continue with a new interaction.

THE ELEMENTS OF THE PERSONAL

Every Personal Interaction (for short, its called a Personal) consists of a Goal, Participants, a Purpose, and supporting Strategies, Tactics, and Mods.

The entire sequence of a personal from start to finish is called an Interaction.

The Goal

Every Personal has a Goal: a statement of the desired results. Goals are usually stated as a phrase or a sentence, and are subject to approval by the Referee.

The Participants

The Participants in a Personal are the Actor and the Target.

Actor. The Actor is one or more characters resolving the Personal. The Actor is typically a Player Character.

Target. The Target is one or more characters who are the object of the Actor's activity. Targets are typically role-played by the referee.

The Purpose

A Purpose is a subordinate Goal within a Personal. There are four general Purposes: Carouse, Query, Persuade, and Command.

Strategies

Players implement their Purpose with a Strategy. The Player selects a strategy and determines its value. The Actor determines the Strategy value based as points from the Strategy table.

Tactics

Actors add strength their Strategies with Tactics. The Player selects a Tactic and determines its value. Tactics are typically multipliers applied to Strategies.

THE FOUR TYPES OF PERSONAL

There are four general types of Personal: Carouse, Query, Persuade, and Command.

Each Personal is generated with 2D; but they have escalating Difficulties: Carouse 1D, Query 2D, Persuade 3D, and Command 4D.

Check <Personal>

Check Personal is resolved by noted the appropriate Personal and any Mods. Roll the appropriate number of dice: if the result is equal to or less than the Personal plus Mods, the check succeeds. Otherwise it fails.

Carouse (Difficulty= 1D)

Carouse is a general enjoyable social activity, paraphrased as "Let's Have A Good Time!" The Actor and Target interact socially, getting to know each other better. Neither asks anything of the other or makes any demands of the other.

Carouse has a social purpose. When successful, the participants establish a foundation of acquaintance and familiarity which allows later attempts at Query or Persuade. For example, businessmen have dinner together to get acquainted before they start negotiating a deal. A salesman may take a client to an athletic event before a later meeting presenting their line of products.

The casual friendship created by Carousing is expressed as Mod +1 per successful Carouse (to a reasonable maximum of 6).

Query (Difficulty= 2D)

Query is devoted to obtaining information or performance of a discretionary duty, paraphrased as "Tell Me About X." The Actor asks the Target some question. Often, the Target already has a responsibility to provide simple answers, and Query is devoted to obtaining additional information, elaborating, or assistance.

Query is an information gathering activity. That information may be a goal in itself, or it may be helpful in determining what specific actions will later be requested.

Functionaries often decide whether to help a customer based on their reactions to their requests. Query is the method of asking for their help.

Persuade (Difficulty= 3D)

Persuade is devoted to obtaining decisions which the Target is free to make, paraphrased as "You Should Do X." Its goal is to make the object decide to do something (or to decide to not do something). It implies that the Target will use some rationale (usually provided by the Actor) to make that decision.

Persuade is a convincing activity. Some action by the Target is necessary, and Persuade is the Actors attempt to make that happen. Extreme examples of Persuasion may be coerced.

Command (Difficulty= 4D)

Commands are not easily given. Individuals may be persuaded to do things, but rarely do they obey commands without a social structure to back them up, paraphrased as "I Require You To Do X." Its goal is a specific action (or inaction) by the Target. It depends on external social structures or social dominance to bring about obedience.

Command is an order-giving activity. Authority figures (for example, police officers) can give commands; organizational superiors (for example, those with a higher rank in a company or military unit) can give commands.

THE FIVE LAWS OF PERSONAL INTERACTION

Personals are governed by the Five Laws: a series of statements detailing how social interaction operates.

Law 1. Similarity. Similar people cooperate.

Law 2. Superiority. Superiors give commands.

Law 3. Inferiority. Inferiors use politeness and flattery.

Law 4. Comfort. Comfort promotes cooperation.

Law 5. Violence. Violence compels obedience.

The Five Laws are universal: they apply across many different cultures. For example, there is no culture in which inferiors bark commands at superiors. When a traveller encounters a society in which this occurs, then there are cultural forces at work which explain it. Perhaps, barking orders is perceived culturally as behavior for inferiors. In practice, those "orders" are obeyed only when a superior actually wants to.

The triggers for the Laws are binary: a character is Similar, or not; is Superior, or not; is Inferior, or not.

If the character can point out (to the Referee) facts supporting the Law, it allows a Mod based on the Five Laws Table.

The Laws of Similarity

Social interaction is enhanced when the speaker demonstrates common links with the listener. When the Actor can establish common interests, a Strategy can provide Mods which support a positive result.

Similarity (and common interests) is established by obvious observable facts (a uniform; an obvious career, an interesting insignia on a shirt).

For example, a non-player character may wear a shirt with an Imperial Army logo: an Army veteran can use that fact to establish similarity. Or, in the course of Carousing, a character may learn facts which support similarity.

Similarities, include: common skills, knowledges, careers, life pursuits, or homeworlds.

The Law of Superiority

Superiors have the charisma to support Query, Persuade, or Command.

When the Actor can establish superiority, it provides positive Mods.

For example, superiority in Rank, in an appropriate Characteristic, or even being armed.

The Law of Inferiority

Inferiors support Query or Persuade by appealing to Superiors.

When an Actor can establish Inferiority, it provides Positive Mods.

If Inferiority is used in an Interaction, the Actor cannot subsequently use Similarity or Superiority.

For example, inferiority in Rank, or in an appropriate Characteristic.

The Law of Comfort

Personals become easier as the level of comfort rises. Providing Comfort typically involves hospitality: buying meals, picking up the check at dinner, providing a ride to a destination, providing a small helpful part, or bit of advice.

When the Actor can establish Comfort, it provides positive Mods.

For example, after casually meeting the Target, he offers a ride to the hotel, or he buys a shared meal.

The Law of Violence

Personals backed by violence have a greater risk of violence in response.

The use of Insult or Pain as a tactic makes the Personal Violent (or Threat of Violence). The Actor may use Fighting skill (or any subordinate Knowledge) as a Mod.

If the Personal fails, the interaction ends and become a Fight.

DISTANCE

Personals take place at a distance which allows for conversation, typically Vshort or Talking. A meaningful Personal cannot be accomplished at a distance greater than Vshort.

By Communicator. Personals can be attempted by Communicator, subject to a Mod -4.

STATING A PERSONAL

The components are simple words or phrases which convey the process. Because this is an on-going role-playing situation, there is no need to repeat the data sought, or the identity of the clerk. The Personal tells the referee enough information to resolve the situation.

TALKING TO THE CLERK

The ship needs a replacement part for the J-Drive. Engineer Gustav Windhoek knows exactly what the part is, but for some reason the drive logs don't reflect the proper part number. He goes across the tarmac to the parts window. There's a sign posted: "Closed For Inventory. Come Back Tomorrow."

He taps on the glass to get the clerk's attention.

The Referee rolls 2D each for the Clerk's Carouse (= 5), Query (= 9), Persuade (= 7) and Command (=8). These values are behind the screen.

The clerk comes to the window, "We're closed. Come back tomorrow."

Gustav asks "Can you help me?" Check Query (=9). Query (Difficulty = 2D) Gustav rolls 6. The Clerk asks, "What do you need?"

"My Drive Reciprocator comes in three alternate variations, and I can't find the identifier for the one I have. Check Query (=9) Gustav rolls 11. "Whoa! That's way beyond me. You need to talk to the Lieutenant. Over there."

THE INTUITIONS

Related to the Personals are the three Intuitions: **Insight**, **Luck**, and **Curiosity**. Characters from time to time are awarded values for these Intuitions in the current session (they cannot be accumulated).

The Procedure

At the beginning of the current game session, the Referee may decide to use the Intutions. Each player rolls 2D (ties reroll). The highest roll receives **Insight**. The second highest receives **Curiosity**. The lowest receives **Luck**.

Each Intuition can be used by its character as desired in the current session

Check Insight. The character can see (or puzzle out) correct action, which usually expresses itself as a question: "Why don't we try (blank)?"

Roll 2D. If the result is equal or less than **Insight**, the proper course of action reveals itself to the character.

Check Curiosity. The character wonders about the nature of objects or the environment, which usually expresses itself as a question: "Why is that (blank)?"

Roll 2D. If the result is equal or less than **Curiosity**, the nature of the object becomes apparent.

Check Luck. The character is naturally lucky. When a negative event occurs, he has a chance that it will miss him. "Just lucky I guess." Luck applies to its holder: it cannot be shared or transferred to others.

Roll 2D. If the result is equal or less than **Luck**, the negative event does not happen.

Personals

Interacting with other sophonts requires a knowledge of the principles of interpersonal actions.

Personals

Purpose	Strategy		Tactics: Interests	Enemies	Logic	Authority	Morality	Culture	Emotion	Indebted	Payment	Begging	Politeness	Flattery	Referral	Familiarity	Insult	Pain
1D Carouse	Casual	**1**	+3	+2		no					no	no		x2	x2	x2	no	-8
	Enjoyment	**2**										no		x2	x2	x2	no	-6
	Discussion	**3**			x2	x2	x2	x2	x2						x2	x2	no	-6
	Active Listen	**4**																-6
	Appeals To	**5**			X2		x2	x2	x2		x2	x2	x2	x2				+4*
2D Query	Enjoyment	**1**										no		x2	x2	x2	no	-6
	Discussion	**2**			x2	x2	x2	x2	x2						x2	x2	no	-6
	Active Listen	**3**																-6
	Appeals To	**4**			X2		x2	x2	x2		x2	x2	x2	x2				+4*
	Force of Will	**5**			x2	x2	x2	x2	x2			no					x2	+6*
3D Persuade	Discussion	**1**			x2	x2	x2	x2	x2						x2	x2	no	-6
	Active Listen	**2**																-6
	Appeals To	**3**			X2		x2	x2	x2		x2	x2	x2	x2				+4*
	Force of Will	**4**			x2	x2	x2	x2	x2			no					x2	+6*
	Charming	**5**		x3		x2	x2	x2	x2	x2		x2		x2	x2			-4*
4D Command	Active Listen	**1**																-6
	Appeals To	**2**			net		x2	x2	x2		x2	x2	x2	x2				+4*
	Force of Will	**3**			x2	x2	x2	x2	x2			no					x2	+6*
	Charming	**4**		x3		x2	x2	x2	x2	x2		x2		x2	x2			-4*
	Angry	**5**		x3	x2	x2	x2	x2	x2	x2							x2	+6*

THE FIVE LAWS

		Carouse	Query	Persuade	Command
1	Similarity	+1	+1	+1	
2	Superiority		+1	+2	+3
3	Inferiority		+1	+2*	
4	Comfort	+2	+1	+1	
5	Violence		+1	+2	+3

*if Begging, Flattery, or Politeness.

The Five Laws are a series of statements governing interactions.

Similarity. Similar people cooperate.

Superiority. Superiors give commands.

Inferiority. Inferiors use politeness, flattery and begging.

Comfort. Comfort promotes cooperation.

Violence. Violence (or its threat) compels obedience.

DISTANCE

If by Communicator, Mod -4.

THE BASIC RULES

Purpose	D
Strategy	
Tactic	X
Laws	
Mod1	
Mod2	
Target No. =	

1. Select a Purpose
2. Select a Strategy
3. Select a Tactic
4. Apply the best applicable Law
5. Apply up to **two** Mods, as available.

Roll against the Target Number.

Each success in Carousing increases Cameraderie +1.

Any Failure stops the Interaction (but Please Reconsider may be possible).

MODS

Personals are influenced by several circumstances.

Strategies. After the first use of a Strategy, Mod -1 per use of a Strategy.

Tactics. After the first use of a Tactic, Mod -1 per use of a Tactic.

Urgent. If there is a time constraint, try a Purpose only once with Mod +2.

Deliberate. Carefully planned query or persuasion allows using a Third Tactic.

(Threat of) Violence. Use of Fighting as a Mod. makes a Personal Violent. If a Violent Personal fails, the Personal becomes a Fight.

Bluff. Use Flux as Mod at the last minute before resolving the Personal (can be used once in the conversation).

Brazen. Mod +3 in Query or Persuade.

Please Reconsider. A Failure can be rerolled as **Please Reconsider** IF Begging/Politeness/Flattery are possible for the Strategy. For the rest of the Interaction, only Inferior Mods can be used.

Personals

Interacting with other sophonts requires a knowledge of the principles of interpersonal actions.

Personals

THE PURPOSE

A Purpose is a subordinate Goal within a Personal. There are four general Purposes:

Carouse "Let's Have A Good Time!"

The participants interact socially, getting to know each other better. Neither asks anything of the other.

Query "Tell Me About X."

Query is information gathering. Query is devoted to obtaining information or the performance of discretionary duties. Information may be a goal in itself, or it may be helpful in understanding the Target.

Persuade "I Request You Do X"

Persuade is a convincing activity. Its goal is to make the object decide to do something (or to decide to not do something). Persuade is devoted to obtaining decisions which the Target is free to make.

Command **"**I Require You Do X"

Command is order-giving. Its goal is a specific action (or inaction) by the Target. It depends on external social structures or social dominance to bring about obedience. Individuals may be persuaded to do things, but they rarely obey commands without a social structure to back them up. Authority figures (for example, police officers) and organizational superiors (for example, higher rank in a company or military unit) can give commands.

STRATEGIES

Players implement their Purpose with a Strategy. The Player selects a strategy and determines its value.

Casual [Our Interaction Has No Long-Term Effects]. The encounter is unstructured and unconcerned with ultimate goals.

Enjoyment [Let's Enjoy Ourselves]. The encounter is based on recreation and the pleasure of personal interaction.

Discussion [Let's Exchange Information]. The encounter is focused on conversation about some topic of mutual interest.

Active Listening [I Enjoy Listening To You]. The Actor listens and encourages participation by the Target.

Appeals To [Do X Because of Y]. The Actor focuses on a tactic to focus the interaction.

Force-of-Will [Do X Because Of My Strength]. The Actor strongly presents information based on Tactic.

Charming [My Positive Emotions Influence You. The Actor presents positive social cues in the conversation.

Angry [My Negative Emotions Influence You]. The Actor dominates the conversation with negative social cues.

TACTICS

Actors add strength their Strategies with Tactics. The Player selects a Tactic and determines its value.

Common Interests [We Share The Same Interests]. The particpants have knowledge of the same subjects.

Common Enemies [We Share The Same Adversaries]. The participants have interests opposed by the same adversaries.

Logic [Logic Requires You Do X]. Actor indicates that Logic supports compliance.

Authority [My Authority Requires That You Do X]. The Actor is empowered by an outside source to expect assistance.

Morality [Morality Requires You Do X]. Actor indicates that the Target's Morality supports compliance.

Culture [Culture Requires You Do X]. Actor indicates that the Target's culture support compliance.

Emotion [Emotion And Sympathy Require You Do X]. Actor supports the Strategy in emotional terms.

Debt [You Owe Me]. Actor indicates that compliance will cancel a debt between Target and Actor.

Payment [I Will Give You Money]. Actor offers money in return for compliance.

Begging [Charity Requires That You Do X]. Actor assumes an inferior position by requesting assistance.

Politeness [I Include Appropriate Courtesy]. Actor makes use of courtesy to supplement Strategy.

Flattery [I Tell You Positive Compliments]. Actor makes use of flattery to supplement Strategy.

Referral [I Am Vouched For By Another]. A third party has provided details about Actor's character.

Familarity [I Am Known To You]. Actor is a friend or acquaintance of Target.

Insult [I Reinforce My Appeal With Dominating Negative Words]. The use of insults punctuates the appeal.

Pain [I Will Hurt You If You Do Not Do X]. Actor indicates he will provide negative consequences.

Captain Lagash Visits the Lone Star

Captain Eitan Lagash of the **Wilderness Traveller** and his First Officer **Aia Resteff** have arrived at Glisten Belt Starport on their way rimward. After offloading their cargo and handling various details, they visit the Lone Star. They are interested in general information about the worlds they may visit, and are always open to discussing a charter to a patron.

1. Aia Bungles The Encounter

They enter and look around. There is an Aslan male in the corner and they identify him as a likely patron. Aia approaches him: "We're looking for a patron to hire us."

She wants to persuade him to charter the **Wilderness Traveller**.

RESOLVING A PERSONAL

Purpose	Persuade	3 D
Strategy	Appeals To	3
Tactic	Logic	x 2
Laws		
Mod1		
Mod2		
	Target No. =	6

She has to roll 6 or less on 3D. She rolls 10 and fails. The Aslan laughs at her.

2. The Captain Approaches A Patron

Captain Lagash watches the crowd for a while, and finally sees a likely prospect: a prosperous looking gentleman. He walks over and introduces himself.

"Excuse me. Hi. I'm Lagash on the *Wilderness Traveller*. We're heading rimward into the Hierate, which is new territory for us. Can I buy you a beverage and talk for a few minutes?"

RESOLVING A PERSONAL

Purpose	Carouse	1 D
Strategy	Discussion	3
Tactic	Culture	x 2
Laws	Similarity	+1
Mod1		
Mod2		
	Target No. =	7

He has to roll 7 or less on 1D. He rolls 3. The two seem to get along well.

He learns that, they are both Star Marine veterans and the prospect's name is Ank Jonston.

Success awards Captain Lagash Cameraderie-1.

3. The Captain Continues

The two talk for a while. He introduces Aia to Ank. Everyone has a good time.

RESOLVING A PERSONAL

Purpose	Carouse	1 D
Strategy	Active Listen	4
Tactic	Culture	x 2
Laws	Similarity	+1
Mod1	Strategy Again	-1
Mod2	Cameraderie-1	+1
	Target No. =	9

He has to roll a 9 or less on 1D, and success is automatic.

He learns Jonston imports premium Aslan textiles.

Captain Lagash adds Cameraderie-1 for a total of Cameraderie-2.

4. Lagash Asks Some Questions

Lagash steers the conversation toward information gathering. He asks about the worlds rimward of Glisten.

RESOLVING A PERSONAL

Purpose	Query	2 D
Strategy	Appeals To	4
Tactic	Familiarity	x 2
Laws	Similarity	+1
Mod1		
Mod2	Cameraderie-2	+2
	Target No. =	11

He has to roll a 11 or less on 2D; he rolls 7 and succeeds.

Ank tells him several stories about trade on worlds to rimward.

5. Lagash Asks for Referral Chip

Jonston knows merchants in the rimward territories. Having a referral from Jonstone would be a great help.

Lagash escalates to Persuade and asks Jonston for a referral chip.

RESOLVING A PERSONAL

Purpose	Persuade	3 D
Strategy	Charming	5
Tactic	Flattery	x 2
Laws	Similarity	+1
Mod1		
Mod2	Cameraderie-2	+2
	Target No. =	13

He has to roll a 13 or less on 3D. He rolls 15 and fails. Maybe he was too aggressive, or didn't explain himself well enough.

Or maybe Ank doesn't like giving referrals.

6. Lagash Asks Again

Lagash is undeterred: he continues to talk about trade and how helpful such a referral chip would be. He asks Ank to Please Reconsider.

RESOLVING A PERSONAL

Purpose	Persuade	3 D
Strategy	Charming	5
Tactic	Flattery	x 2
Laws	Similarity	+1
Mod1		
Mod2	Cameraderie-2	+2
	Target No. =	13

He has to roll a 13 or less on 3D. He rolls 6 and Ank codes the Captain a chip. They spend the rest of the evening telling travel stories.

OR

He rolls 16. Jonston again says no. Lagash and Aia excuse themselves and return to their ship.

Objects vary widely in quality and usefulness. This variation gives seemingly identical objects a variety of positive and negative attributes. The QREBS system details these differences.

Despite the uniformity which mass production techniques impart to their output, individual pieces of equipment can vary widely due to the differences between manufacturers, and the different emphases that they give to design and quality.

THE QREBS EQUIPMENT EVALUATION SYSTEM

The QREBS (pronounced “krebs”) system evaluates pieces of equipment for five essential characteristics:

Q	**R**	**E**	**B**	**S**
Quality	Reliability	Ease Of Use	Bulk /Burden	Safety
QUA	REL	EOU	BUR	SAF
2D-2	**Flux**	**Flux**	**Flux**	**Flux**

Objects. Any item which is subject to QREBS is called an **object** (or a device, a piece of equipment, a machine, an item, or an apparatus). QREBS is primarily concerned with devices and machinery, but it can also be used (judiciously omitting some parts of the system) with plants and animals, artwork, even books, drama, or music.

Multi-Component Objects. Where several objects are combined into a larger item (for example, components combined to become a groundcar), the proper use of the QREBS system is to treat each major subsystem separately.

THE QREBS FORMATS

Full QREBS

QREBS = 4 -4 -4 +4 0

Write the individual values (preceded by + / -.
Notice the first Digit Quality has no sign.

Individual QREBS Values

qreBs = - 4

Capitalize the appropriate value.

Burden = - 4

Write out the appropriate value as a word.

BUR = - 4

Abbreviate it.

B = -4

Use the appropriate value as a letter.

Use Equal (to avoid confusing a minus with a hyphen). (B = - 4 rather than B - 4; B = +1 rather than B +4).

The essential rule is to state the value in an unambiguous way to ensure easy comprehension

THE STANDARD OR EXPECTED VALUE IS…

The most common roll for any of the QREBS values is zero (or 5 for Quality). If values have not been created or calculated, the standard values apply.

The presence of standard or expected values makes the entire system optional, or applicable piecemeal.

THE FIVE QREBS VALUES

QREBS values (except for Quality) are Flux values from -5 to +5. Quality is a number (2D-2) from 0 to 10. Low values are poor or bad; high values are good (Burden is an exception; low Burden is better).

Quality is an overall measure of workmanship.

Reliability is compared to Flux for the occurrence of mishaps.

Ease of Use is a Mod on tasks using an object.

Burden is a Mod on the felt weight of an object.

Safety is compared to Flux for Dangerous and Destructive Mishaps.

Q Quality

Quality is a measure of the consistency of workmanship, merit, value, or worth of an object. It directly reflects the time period between reliability downgrades.

Determining Quality. Quality may be pre-specified for an object; if not, it is generated with 2D-2.

Quality Mod. The Quality Mod (=Q minus 5) is a Flux equivalent to Quality and is used as a Mod when using the object.

Quality Gives Period directly on the Quality table.

For example, a Vacc Suit Q= 5 is an average Quality piece of equipment. A Jump Drive Reciprocator Q= 9 is Better Than Most.

A Quality. The top value in ordinary situations for a QREBS object is 10. Expressing 10 in Ehex, top Quality objects are A Quality.

(Even higher quality is possible).

P Period

Period is the elapsed non-storage time between Reliability downgrades.

Period= Quality.

As each Period ends, reduce Reliability for the object by minus 1.

For example, a Vacc Suit Q= 5 is an average Quality piece of equipment: Q = 5 translates to Six Month Periods and it degrades one level of Reliability every six months when in use. A Jump Drive Reciprocator Q= 9 is Better Than Most; Q= 9 translates to Four Year Periods. It degrades one level of Reliability every four years when in use; on the other hand, if the Jump Drive Reciprocator is in original packaging on the shelf, it probably does not degrade.

R Reliability

Reliability measures the dependability of an object.

Reliability = Flux. Or as specified otherwise.

Reliability Degradation. Reliability degrades at a rate determined by the Quality of the equipment. Quality indicates Period (usually the number of years between reliability downgrades). Reduce reliability by -1 at the end of each period.

Reliability is independent of Quality.

An object can be Low Reliability and High Quality. For example, a Jump Drive Reciprocator Q=9 and R= -2 is Somewhat Unreliable, BUT Q=9 states that its Reliability will not get any worse for at least four years.

An object can be High Reliability and Low Quality. A Vacc Suit Q= 3 R=+3 is Lesser Quality and Reliable. In any specific use, the Vacc Suit can be depended on to function properly, but it needs to be checked

Staving Off Reliability Downgrades. When (or before) an object reaches Reliability Downgrade, a competent technician can perform an IROAN (Inspect and Repair Only As Necessary).

To IROAN (1D Hours)
Average (2D) < Characteristic + Skill + Quality Mod + Mod
Uncertain 1D if Skill < 6

Success forestalls the Reliability Downgrade.

For example, Eneri Dinsha is comfortable with his Vacc Suit QREBS= 3 +3 +3 +3 +3. It is of Lesser Quality, but Reliable, Easy to Use, Easy to Wear, and Safe to Use. Since he likes it and is comfortable with it, and since he cannot afford better at the moment, he takes steps to keep it in good repair: Every week he has it IROAN checked by a Vacc Suit-6 technician.

No Downgrades in Quality Storage. Objects in proper storage (temperature controlled, anti-corrosion packaging, no energy cells installed) have Reliability Downgrades suspended.

Why Is It Unreliable?

Equipment may be less reliable due to wear, age deterioration, poor engineering, or poor craftsmanship.

E Ease of Use

Ease of Use measures the facility with which a piece of equipment can be put into operation.

Ease of Use = Flux. Or as specified otherwise.

Large Equipment: Ease of Use refers to individual systems rather than to the craft or vehicle or assembly as a whole.

For example, a Communicator with EOU= +5 is activated with the touch of a single button. An Inertial Navigator with EOU= -5 requires careful calibration before use and displays position as a series of 8-digit numbers.

Using Ease Of Use

Ease of Use is a Mod on tasks involving the object or device.

Why Is It Hard To Use?

An object may have low Ease of Use for several reasons.

Bad Design. The object may be designed by engineers who have not clearly considered how it will ultimately be used.

Cheap. Standard (but ill suited) components may have been used to reduce cost.

B Burden (or Bulk)

Burden measures the difficulty of carrying or using a piece of equipment. It expresses how ergonomically well-fitted to use the item is. Alternatively, it measures the bulk or unwieldiness of an object.

Burden = Flux. Or as specified otherwise.

Note that the sign on Burden runs opposite to the signs on the other elements of QREBS: minus is good and plus is bad. The reasoning is that negative Burden reduces felt weight or mass, and positive Burden increases felt weight or mass and becomes more burdensome.

For example, a Pistol Burden= -5 feels light in the hand and is barely noticeable in its holster. A Revolver Burden= +5 feels bulky, awkward, and unbalanced. It fits poorly in the holster and is difficult to remove.

Using Burden

Burden is the reduction in the perceived Load for a character (not to exceed its actual weight or mass). For example, an Advanced Combat Rifle-10 weighs 2.8 kilograms. A model with BUR= -4 reduces that felt weight by -4 kilograms (effectively cancelling its Burden on the character).

Why Is It Bulky?

An object may have poor Bulk for several reasons.

Lack Of Design. The designers may not have clearly understood the interaction of the user and the object.

Unwieldy. The object has no natural features for grasping, or such features may be uncomfortable or even painful.

Unbalanced. The object is not well balanced.

Why Is It Easier To Carry?

Objects with a low Burden are easier to carry. Possible reasons include:

Handles. An attached handle would make it easier to carry this object.

Straps. A strap or shoulder sling allows the object to be carried in a slung position without using the hands.

Packs. A pouch or bag with straps allows several different objects to be carried without using the hands.

Ergonomic. Some objects are naturally (or deliberately) configured so that they are easy to carry or manipulate.

S Safety

Safety measures the inherent safety or danger presented by an object when in use. It expresses the possibility or probability that use of a piece of equipment will inflict pain, injury, or even death.

Safety = Flux. Or as specified otherwise.

For example, a Respirator Safety= -5 lacks a battery reserve and a low energy warning; its compressor can catastrophically fail and send metal shavings into the face. A Filter Mask with Safety= +5 is constructed so replacement filters can only be inserted correctly. With Ease-of-Use +5, they can also be inserted while the Filter Mask is being used.

Using Safety

Safety is the roll which determines if a mishap is dangerous or destructive. If Safety is equal or less than Flux, then the mishap injures the operator. On a separate roll, if Safety is equal or less than Flux, then the mishap damages or destroys the object.

Why is It Unsafe?

There are many possible reasons why an item may be unsafe.

Lack of Safety Features. The item is poorly designed in terms of safety and lacks safety features, guards on moving parts, fail-safe mechanisms.

Inherently Hazardous. The item is inherently unsafe because it is intended to produce hazardous consequences: knives or cutters, poisons, explosives.

EVALUATING OBJECTS

The QREBS values for an object are initially unknown (and assumed to be QREBS = 5 0 0 0 0).

Inspecting An Object

A skilled individual can check an object: it takes about an hour to carefully look it over, test its operation, disassemble and reassemble it looking for flaws or problems.

The inspector must have a skill related to the object.

For each QREBS value,

Roll Flux plus the QREBS value.

The referee should reveal one correct (regardless of flux) QREBS value for each level of skill (to a maximum of 4).

POTENTIAL DISASTER

Every day, there is the potential for objects to fail.

The Daily Roll

At the beginning of each game day, the Referee rolls Flux.

Daily Zero or Greater. The QREBS system is ignored unless something important arises.

Daily Less Than Zero. There is the potential for Mishaps throughout the day. The QREBS system may come into play and this may turn into a Bad Day.

Why? QREBS is intended to add spice to adventures, not to bog them down in trivial accidents and mishaps.

The Potential Bad Day

When a significant piece of equipment is brought into use for the first time on a Potential Bad Day, roll for its Potential Failure.

Potential Failure if	Reliability <= Flux

Passing. If the equipment passes this test, it performs properly throughout the day.

Failure. If it fails this test, roll 1D, which is the next use in which it fails. If the item is in continuous use, the result is the hour in which it fails.

Warnings of Failure. When a device starts to fail while in operation, it will emit warning signals (telltale warning lights, squeaks, smoke, dust, shavings, vibrations) for Reliability (in half-hours) before failure.

Over Until Tomorrow. Once it has been determined that a device will fail, the event is foreordained. If the failure doesn't happen during the current day, it will happen in immediate future use.

Dangerous and Destructive Mishaps. When the mishap occurs, determine if it is dangerous or destructive or both.

Roll Flux twice.

Dangerous Mishap if	Safety <= Flux
Destructive Mishap if	Safety <= Flux

A dangerous mishap may injure the user/operator.

A destructive mishap may destroy parts of the device.

AN ADVENTURE ON ZEYCUDE

Eneri Dinsha 777777 needs a new respirator. He checks at the Starport market and finds one, buys it and throws it in his pack for the day when he will need it.

The Referee quietly rolls QREBS for the item.

Q= 5. R= -2. E= +2. B= -1. S= -1.

Several weeks later, he arrives at Zeycude C330698-9 and its Atm-3 means he needs a Respirator. He digs in his pack and gets his out.

Mishaps. The Referee has privately determined today is a Potential Bad Day. He has also privately rolled for this Respirator. 2D + - 2 = 3 -2 = -1 = Failure. He further rolls 1D = 5 = a failure in 5 hours.

Ease of Use. The first thing he notices is that it so easy to put on and adjust. EOU= +2.

Burden. The second thing he notices is that it feels heavy. BUR = -1.

Because reliability is less than 1, there is no warning of the impending mishap. Five hours later, Eneri has left his vehicle and is walking toward a maintenance shop. He's two minutes away from a doorway and the respirator stops working.

Atm 3 inflicts Suff-2 every minute. For the first minute, he rolls 2D and applies them to Int and Edu, even as he realizes that he has a problem and sprints to the doorway. For the second minute, he again applies 2D to Int and Edu.

He just makes it, and collapses inside the airlock door.

He rolls Flux against Safety for Dangerous (= +4 = no effect). He rolls Flux against Safety again for Damage (= -3 = Damaged) and finds that his Respirator has basically shut down with a bearing failure.

He needs a new Respirator. He notices some fine print on the tag that he can return this one (postpaid) for a refund or replacement.

WHY USE QREBS

The most common roll for any QREBS value is 0 (5 for Quality). The neutral QREBS value adds nothing or takes away nothing.

The purpose of QREBS is:

To add variation to otherwise standard objects. When the adventurers visit a store, they can buy communicators. QREBS allows the store to offer a range of products instead of a single model.

To add variation to otherwise standard adventures. Devices have the potential of breaking down; new found treasures can turn out to be junk. Some acquisitions can prove to be especially reliable or useful.

Do I Use This Every Day?

Although players will certainly pursue devices and objects that are high quality, the primary beneficiary of QREBS is the referee.

QREBS is the mechanism that justifies special situations and special circumstances in the course of ordinary adventures. Without a rules basis, it is difficult for a referee to impose, and for players to accept, the sudden breakdown of vehicles and equipment, or the failure of a weapon at a crucial time. Under the QREBS regime, the catalog of equipment is vastly larger and filled with goods from the very good to the very bad.

But every day? No. QREBS can be safely ignored most of the time. In fact, the average QREBS value is 0 = no effect.

QREBS-1

Despite the uniformity which mass production techniques impart to their output, individual pieces of equipment can vary widely due to the differences between manufacturers, and the different emphases that they give to design and quality.

QREBS-1

THE QREBS EQUIPMENT EVALUATION SYSTEM

The QREBS (pronounced “krebs”) system evaluates pieces of equipment for five essential characteristics: Quality, Reliability, Ease Of Use, Bulk (or Burden) and Safety.

Objects. Any item which is subject to QREBS is called an **object**. It may alternatively be called a device, a piece of equipment, a machine, an item, or an apparatus. While QREBS is primarily concerned with devices and machinery, it can also be used (judiciously omitting some parts of the system) with plants and animals, artwork, even books, drama, or music.

Multi-Component Objects. Where several objects are combined into a larger item (for example, components combined to become a groundcar), the proper use of the QREBS system is to treat each major subsystem separately.

Q QUALITY

2D-2	Description	Mod	Period
0	Very bad	- 5	Minutes
1	Bad	- 4	Hours
2	Poor	- 3	Days
3	Lesser	- 2	Weeks
4	Below average	- 1	Months
5	Average	0	Six Months
6	Better than some	+1	One Year
7	Better than many	+2	Two Months
8	Very good	+3	Three Years
9	Better than most	+4	Four Years
10	Excellent	+5	Ten Years
11	Superb	+6	Twenty Years
12	Masterpiece	+7	Centuries

Quality is a measure of the workmanship of an object. It directly reflects the Period between reliability downgrades.

Quality= 2D-2. Or as specified otherwise.

Quality Mod= Q minus 5. Converted to Flux for use as a Mod.

When an Object fails, reduce its Quality by -1.

Period is the time between Reliability downgrades.

As each Period ends, reduce Reliability for the object by -1.

For example, an Average quality object with a Period of One Year is reduced in Reliability -1 every Year.

When an Object fails, reduce its Period -1.

R RELIABILITY

Value	Description
- 5	Very unreliable
- 4	More unreliable
- 3	Unreliable.
- 2	Somewhat unreliable
- 1	Slightly unreliable.
0	Reliability neutral.
+1	Better than some.
+2	Better than many.
+3	Reliable.
+4	More reliable.
+5	Very reliable.

Reliability measures the dependability of an object.

Reliability = Flux. Or as specified otherwise.

Reliability Degrades. Reliability degrades -1 per Period.

Reliable / Unreliable

E EASE OF USE

Value	Description
- 5	Very difficult to use
- 4	More difficult to use
- 3	Hard to use.
- 2	Somewhat hard to use
- 1	Slightly difficult to use.
0	Ease of use neutral.
+1	Better than some.
+2	Better than many
+3	Easy to use.
+4	Easier to use
+5	Very easy to use.

Ease of Use measures the facility with which a piece of equipment can be put into operation.

Ease of Use = Flux. Or as specified otherwise.

Large Equipment: Ease of Use refers to individual systems rather than to the craft or vehicle or assembly as a whole.

EaseOfUse / HardToUse

B BULK / BURDEN

Value	Description
- 5	Very easy-to-carry.
- 4	Easier to carry
- 3	Easy to carry.
- 2	Better than many
- 1	Better than some.
0	Burden neutral.
+1	Slightly un-ergonomic.
+2	Somewhat hard to carry
+3	Difficult to carry.
+4	More burdensome
+5	Very burdensome

Burden measures the difficulty of carrying or using a piece of equipment. It expresses how ergonomically well-fitted to use the item is. Alternatively, it measures the bulk or unwieldiness of an object.

Burden = Flux. Or as specified otherwise.

Burden/Ergonomic
Bulky/Compact

S SAFETY

Value	Description
-5	Very hazardous.
-4	More hazardous
-3	Hazardous.
-2	Somewhat hazardous.
-1	Slightly hazardous.
0	Safety neutral.
+1	Better than some.
+2	Better than many
+3	Safe to use.
+4	Safer to use
+5	Very safe.

Safety measures the inherent danger presented by an object when in use.

Safety = Flux. Or as specified otherwise.

Safe / Hazardous

QREBS-2

QREBS allows an evaluation of used objects based on their age.

QREBS-2

NEW OBJECTS

New objects determine QREBS values without adjustment.

For example, a new Communicator Q=5 Period= 5 (= Six Months) R= 0 is Reliability Neutral when New. After six months, it falls to Reliability= -1, after another six months, it falls to Reliability= -2.

OLDER OBJECTS

When a used or older object is acquired, determine its **True Age** and **Working Age.**

True Age (also Chronological Age) is the number of years since the object was created or manufactured. It is determined from the True Age Table.

Working Age is the number of years the object has been in use. Since use wears an object out, Working Age is the important value in determining Quality and Reliability.

WORKING AGE

Working Age = Good Flux (in Periods)

TRUE AGE

Flux	Current	Antique	Artifact	Surplus	Experi
- 5	50	400	RR	100	20
- 4	35	300	1300	90	10
- 3	25	250	1200	80	9
- 2	21	210	1100	70	8
- 1	18	180	1000	60	7
0	15	150	900	50	6
+1	12	120	800	40	5
+2	9	100	700	30	4
+3	6	80	600	20	3
+4	3	60	500	10	2
+5	new	50	400	new	1

Values are in Years before the present date. Determine the current date and subtract the value on this table.

RR= Reroll and add 1000.

True Age. This table provides the true age of the object.

Storage. The Object has been in Storage (was not used, did not degrade in Quality) for the period between Working Age and True Age. A Communicator with True Age = 100 Years and Working Age = 1 year has been in Storage for 99 years: it is Like New.

AGING THE OBJECT

Create QREBS. Determine its Working Age (= Good Flux in Periods). Reduce Reliability by Working Age in Periods. .

For example, Eneri Dinsha has acquired a Jump Drive Diagnosticator QREBS= 5 0 0 0 0. Period= 5 = 6 Months. Working Age = Good Flux times Period = +2 x 6 months = 1 Year. True Age (from Table) = Flux = -3 = 25 Years.

This device was manufactured 25 years ago, but has only been used for a year. Reduce Reliability Minus Working Age in Periods (=-2), downgrading Reliability to -2.

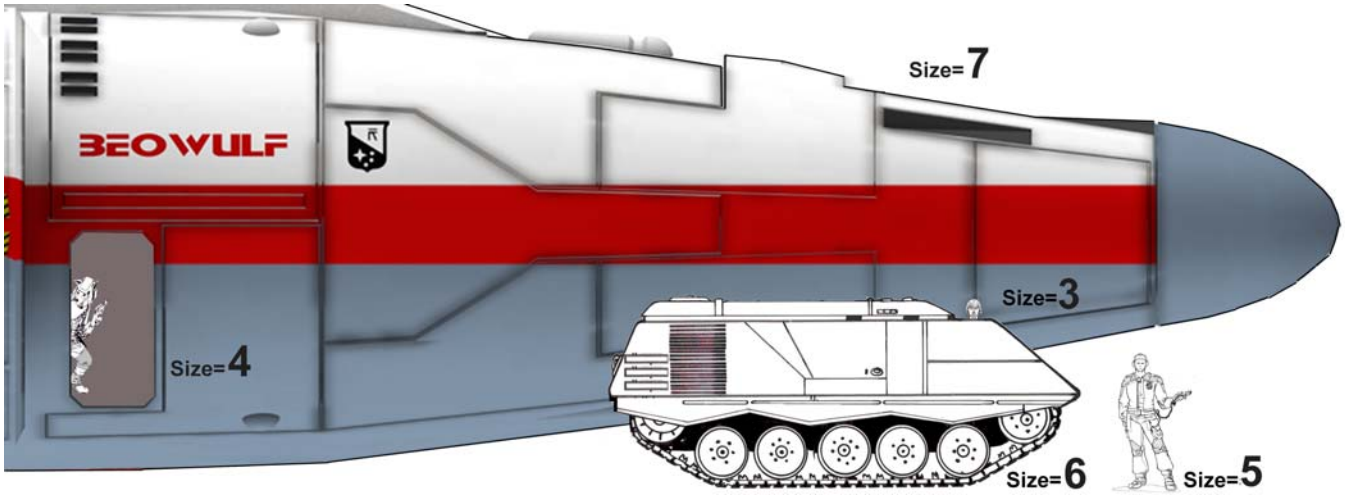
This Jump Drive Diagnosticator QREBS = 5 -2 0 0 0 is unremarkable except it has a -2 Reliability Mod.

CALCULATING QREBS

Q	**R**	**E**	**B**	**S**	**|**	**Wa**	**P**
Quality	Reliability	Ease Of Use	Bulk /Burden	Safety	**|**	Working Age	Period
QUA **2D-2**	REL **Flux**	EOU **Flux**	BUR **Flux**	SAF **Flux**		**Good Flux**	**=Quality**
					|		

Adjust R= - Wa/P

1. Quality = 2D-2. Usually ranges from 10 Excellent to 0 Very Bad.
2. Reliability = Flux. Provides the value for a New object. Ranges from +5 Very Reliable to - 5 Very Unreliable.
3. Ease Of Use = Flux. Ranges from +5 Very easy to use to -5 Very difficult to use.
4. Bulk/Burden = Flux. Ranges from +5 very burdensome to -5. Very easy to carry
5. Safety = Flux. Ranges from +5 Very safe to -5 very hazardous.
6. Period = Quality. Determine the units of time from the Quality Table.
7. Working Age= Good Flux (in Periods).
8. True Age = from Table.
9. Adjust Reliability (= minus subtract Working Age divided by Period; drop fractions).



SIZE, RANGE, SPEED, AND DISTANCE

Size= Range=	0	1	2	3	4	5	6	7	8	9
Size			Eye	Head	Crouch	Person	Vehicle	ACS	BCS	
Range	Contact	Vshort	Short	Medium	Long	Vlong	Distant	VDistant	Orbit	Far Orbit
Distance		5 m	50 m	150 m	500 m	1000 m	5000 m	50 km	500 km	5000 km
Speed	Still	Walk	Run		Tracked	Wheeled	ACV			

Understanding Sizes. Most people are Size=5. A half-hidden person is Size=4, as is a Small sophont. Just a head or a limb is Size=3. A very small control sensor, or an eye, is Size=2. Most vehicles are Size=6. ACS Adventure Class Starships (2000 tons or less) starships are Size=7. BCS Battle Class Starships are Size=8.

Size minus Range gives apparent size. A Size-5 Person at Range=5 looks about the same size as a Size-6 Vehicle at Range=6. If Size minus Range is less than zero, the object to too far away to see (or attack).

Understanding Speeds. Humans (and most sophonts) Walk at Speed=1 and Run at Speed=2. The full array of Speeds is shown on the Vehicles Speed Chart

Personal Combat

Conflicts between individuals, groups, or military units is resolved using the Traveller Combat System.

Combat is the resolution of violent conflict based on the weapons used, the tactics, decisions, and choices of the participants, and some measure of chance. Combat is based on coarse variable scales which give a feeling of authenticity without slavish adherence to exact formulas. Distance is a coarse set of approximate ranges. Time is a coarse measure of passing time. Size is an approximation of the relative size of objects and targets.

Finally, the **Traveller Combat System (TCS)** assumes that many shots and many attacks are taking place, but many bullets go wild and many attacks come to nothing. The system also assumes that there are lulls in the action which characters wait or think or catch their breath. The TCS accomplishes all of these realistic constraints without burdening the players with arbitrary or constraining rules.

THE ELEMENTS OF A FIGHT

A fight includes the following elements:

The Situation

A situation is an encounter. One or both sides have goals and the situation dictates that violence will be used to resolve the conflict.

The encounter is defined by:

The Participants. Participants are characters. One side is the player-characters operated by the players. The opposition consists of non-player characters controlled by the referee. The participants are defined along with the weapons, armor, and protection they are using or have available.

The Terrain. The location and its important characteristics are the terrain. Terrain can provide concealment to hide fighters from the enemy, and cover to protect them from enemy attacks. Terrain also serves to constrain or channel movement by either side.

Initial Range. The distance between the two sides determines which weapons can be used and when.

The Battle

The characters attack, defend, move, and otherwise act to resolve the encounter in a series of Rounds.

In a Round, every participant has the opportunity to move and to use a weapon (or to do some other activity like use a communicator or operate an important device). When every participant has had an opportunity to act, the current Round ends and the next Round begins.

The Aftermath

Once the fight is over, participants resolve the consequences of their actions: gathering the dead, helping the wounded, occupying the territory they have won, or fleeing the enemy to a place of safety.

SCALE

Fighting is based on variable distance in Range Bands, variable time in Rounds, and approximate Size for Objects.

Distance Scale

Physical location for Fighting is tracked using Scaled Range Bands. Each Band is numbered and corresponds to a specific physical distance and to a benchmark object.

For example, Range Band 3 (Range=3) represents a distance of approximately 150 meters. Its benchmark is a book (a typical human can see a Size -3 (book-sized) object at 150 meters, but probably not at the next Range Band).

Weapon maximum ranges are expressed in Range Bands.

Time Scale

Combat takes place in Rounds. Some seem like seconds; some seem like hours. Some pass without anything happening; others are flurries of activity.

At the end of combat, count the number of Rounds that have passed and equate them generally to minutes (thus, a fight taking ten Rounds probably took about ten minutes).

GUNMAKER, ARMORMAKER, AND VEHICLEMAKER

The Maker Series allows referees and players to design and produce weapons, armor, and vehicles for use in the Traveller Combat System.

GunMaker produces a variety of weapons from low tech blades to high-tech plasma guns, and provides their range, cost, combat effects, and other details.

ArmorMaker produces a variety of armors and protections from simple bullet-proof vests to powered armor, and provides their cost, protective abilities, and other details.

VehicleMaker produces a variety of ground and air vehicles and provides their cost, performance, and combat effects.

In addition, an armory full of pre-generated weapons is provided.

NON-COMBAT EVENTS

The Damage rules of the TCS can be implemented in non-combat situations; they detail the effects of storms, blizzards, falls, collisions, and other mishaps.

How Attacks Work

AN OVERVIEW

The central mechanism for Fighting is the **Fighting Action:** an Attacker shoots a weapon at a Target and resolves the Fighting Action to determine if the shot Hits. If it misses, the process ends; if it succeeds, the Attacker determines if it penetrates armor, and then determines damage.

The Fighting Action takes into account:
- The shooter's Characteristic and Skill.
- The target's speed and evasion status.
- The target's size based on range.
- Any target Mods, and
  - If shooting with AutoFire, a range penalty, or
  - If shooting with SnapFire, a greater range penalty.

Unskilled

If the character is unskilled (or using default Fighting=0) use 3D rather than 2D.

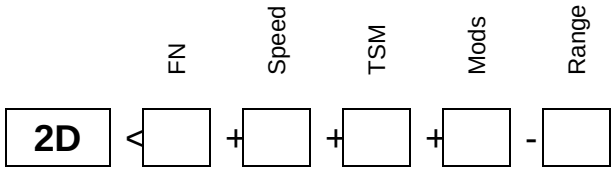
Failure On 12

Any Attack (whether 2D, 3D) fails on a roll of 12.

First Attacker

The first one to attack receives Mod +1 in any Attack against him in the Round. If the First Attacker succeeds, that Target cannot fire in the current Round.

THE FIGHTING ACTION



FN =	Characteristic + Skill
Speed =	Speed
TSM =	Size - Range
Mods =	As appropriate. Status
Range =	If Autofire, 1x Range If SnapFire, 2x Range

Hand To Hand:

Mod= Attacker Str minus Defender Str.

Must be Range=0.

Duelling (Guns, Blades)

Mod= Attacker Dex minus Defender Dex.

Range= 1 or 2.

Aiming

A Weapon may target any Object or part of an Object whose Size is equal or greater than Range.

ATTACK TYPES

	Speed must be	
Aimed Fire	0	Single Shots
AutoFire	1 or less	Full Automatic
SnapFire	any	Quick Unaimed Fire

Special rules apply to Vehicles.

STATUS

Stealthy	Evading	Normal	Unaware	Obvious
- 2	**- 1**	**0**	**+1**	**+2**
Sneaking	Zig-Zag Crouched	Fighting		Surprised

SPEED

	Still	Walk	Run
For People	**0**	**+1**	**+2**
For Vehicles		**(use Speed)**	

Vehicle Speed above 2 is Negative (the vehicle is harder to hit). But, a Vehicle moving directly Toward or Away From the Attacker (then Mod = 0).

TARGET SIZE MOD

TSM= Size - Range

A Size-5 Object at Range=5 has TSM=0.

If TSM is less than 0, the Target cannot be attacked.

If Vehicle is behind something, or a person is prone, Reduce Size by 1.

FIGHTING NUMBER

FN= Characteristic + Skill

WEAPONS SKILLS AND CHARACTERISTICS

Based on Weapon Used:	Skill	Characteristic
Portable	BattleDress	+ Dexterity
Fixed, Tank Mount	Artillery	+ Intelligence
Gun, Gatling	Artillery	+ Intelligence
Cannon, Autocannon	Artillery	+ Intelligence
Launcher	Launcher	+ Dexterity
Laser, Fusion, Plasma	Beams	+ Dexterity
Acid, Fire, Gas, or Stench	Sprays	+ C2
Shock, EMP, Rad, Flash	Exotics	+ C2
Freeze, Mag, Sonic, Grav	Exotics	+ C2
Psi Amp	Exotics	+ Psi
Edged Weapons	Blades	+ Strength
Hand-to-Hand	Unarmed	+ Strength
Designator	Fwd Observer	+ Dexterity
Fires Bullets *	Slug Thrower	+ Dexterity
*and not otherwise assigned.		
Hand Thrown Explosives	Athlete	+ Strength
Or	Explosives	+ Strength

How Armor Works

AN OVERVIEW

When an attack hits a target, the Attacker determines if it penetrates armor, and then if it inflicts Injury to Beings and Damage to Objects. If there is no Armor or Protection, determine Injury or Damage and apply it.

AGAINST ARMOR

1D per Weapon Effect= Injury
If Injury exceed Armor Value:
- Reduce Armor Value -1
- Reduce RadProof -1
- Reduce SoundProof -1
- Reduce Insulated -1
- Reduce Sealed -1

Apply Injury Exceeding Armor to Target

For example, Bullet-2 inflicts 2D against Armor-6.
Roll 2D, subtract Armor-6, and apply the excess to Target.

AGAINST PROTECTIONS

1D per Weapon Effect= Damage
If Damage exceed Protection Value:

Apply Damage Exceeding Protection to Target

For example, Stench-2 inflicts 2D against Sealed-8.
Roll 2D, subtract Sealed-8, and apply excess to Target.

HIT EFFECTS ON ARMOR

Code	Effect	Must Penetrate	Or Must Overwhelm	Armor	EMCage	Flashproof	Radproof	Soundproof	PsiShield	Insulated	Sealed	Type	Injures Beings	Damages Objects
A	Corrode	Armor		▣								Hit	Yes	Yes
B	Bullet	Armor		▣								Hit	Yes	Yes
C	Slash	Armor		▣								Cut	Yes	Yes
D	Blast/Blow	Armor		▣								Hit	Yes	Yes
E	EMP		EMCage		▣							Fry	Awareness	Electronics
F	Frag	Armor		▣								Hit	Yes	Yes
G	Gas		Sealed								▣	Suff	Yes	No
H	Hot		Insulation							▣		Heat	Yes	Yes
I	Infection		Sealed								▣	Hit	Yes	No
J	Psi		PsiShield						▣			Stun	Yes	No
K	Burn	Armor		▣								Hit	Yes	Yes
L	Elec		Insulation							▣		Hit	Yes	Yes
M	Magnetic		( )									Stun	Yes	Magnetics
N	Bang		SoundProof					▣				Deaf	Hearing	No
O	Stench		Sealed								▣	Stun	Yes	No
P	Pain	Armor	Sealed	▣							▣	Stun	Yes	No
Q	Cold		Insulation							▣		Freeze	Yes	No
R	Rad		RadProof				▣					Hit	Yes	Yes
S	Sound		SoundProof					▣				Stun	Yes	No
T	Poison		Sealed								▣	Hit	Yes	No
U	Flash		Flashproof			▣						Blind	Vision	No
V	Vacc		Sealed								▣	Suff	Yes	No
W	Wound	Armor		▣								Hitt	Yes	No
X	Pen	Armor		▣								Hit	Yes	Yes
Y	Grav		( )									Hit	Yes	Yes
Z	Tranq		Sealed								▣	Stun	Yes	No

▣ **=** Attack is stopped by this Armor or Protection. Otherwise, the Armor or Protection is ignored.
Must Penetrate. The act of penetrating destroys Armor. The armor value is permanently reduced.
Must Overwhelm. The act of overwhelming bypasses a protection. The protection value is unchanged.

For example, an EMP Projector hits with EMP-3. The Target has Cage=5. A successful attack rolls 3D (=10) for Fry against the Target. Cage stops 5 of the 10; the Target receives Fry=5 against its Electronics; a person with Awareness receives Ablind-5. An ordinary human would be unaffected.

How Injury and Damage Work

AN OVERVIEW

Injury or Damage in excess of those stopped by Armor or Protection is applied to the Target.
For **Non-Player** Characters and Equipment, make a simple assessment of Out-Of-Action if Injury or Damage is 10+.
For **Player** Characters and Equipment, assess detailed Injury and Damage as necessary.

Non-Player Character Injury = 10+ = Out-Of-Action (ignore Injury 9 or less)
Non-Player Object Damage = 10+ = Out-Of-Action (ignore Damage 9 or less)

CHARACTER HIT LOCATION

If Injury is Hits or Cuts, Consult Hit Location Table

For other Injury, go directly to Injury Table

Location	2D	Location
Head	2	Comms
Head	3	Cargo
Left Arm	4	Sensors
Right Arm	5	Protections
Torso	6	Life Support
Torso	7	Locomotion
Torso	8	Power Source
Left Leg	9	Body Panels
Right Leg	10	Weaponry
Graze	11	Navigation
Graze	12	Computer

Automatic Severity= 1
Automatic Severity= 1

OBJECT HIT LOCATION

If Damage is Hits Consult Hit Location Table

For other Damage. Go directly to Damage Table

INJURY **(to Characters)**

Effect	Injury	Inflicts
Flash	Blind	Blind for Rounds = Injury
Slash	Cut	Total Cuts / 3 = Wound Severity
Bang	Deaf	Deaf for Rounds= Injury
Cold	Freeze	Unconscious if Check C3 fail*
EMP	Fry	Ablind for Rounds = Injury
Hot	Heat	Unconscious if Check C3 fails*
Pen	Hit	Total Hits / 2 = Severity
Bullet	Hit	
Wound	Hit	
Corrode	Hit	
Blast/Blow	Hit	
Frag	Hit	
Burn	Hit	
Rad	Hit	
Elec	Hit	
Infection	Hit	
Poison	Hit	
Grav	Hit	
Pain	Stun	Unconscious for Rounds = Injury.
Psi	Stun	
Stench	Stun	
Tranq	Stun	
Magnetic	Stun	
Sound	Stun	
Gas	Suff	Unconscious if Check C3 fails*
Vacc	Suff	

*Mod -1 per Round of this Injury.

DAMAGE **(to Vehicles and Equipment)**

Effect	Damage	Inflicts
Slash	Cut	Total Cuts / 3 = Severity
EMP	Fry	Inoperable for Rounds = Fry.
Rad	Fry	
Hot	Heat	Inoperable for Rounds = Heat.
Pen	Hits	Total Hits / 2 = Severity
Bullet	Hits	
Corrode	Hits	
Blast/Blow	Hits	
Frag	Hits	
Burn	Hits	
Elec	Hits	
Grav	Hits	
Magnetic	Hits	
Bang		No Effect
Flash		
Gas		
Infection		
Pain		
Poison		
Psi		
Sound		
Tranq		
Vacuum		

Round Fractions Down.

\

How Movement Works

AN OVERVIEW

Characters and Vehicles can change Range Bands in the course of combat.

They can change from one Band to an adjacent Range Band during the Movement Phase of a Combat Round, subject to limitations.

CHARACTER MOVEMENT

Bands 0-1-2

A Character (minimum Speed=1) can move one Band per Round between Bands 0 - 1 - 2.

Bands 3-4-5

A Character (minimum Speed=2) can spend Rounds equal to the destination Band and then move one Band between Bands 3 - 4 - 5 in the Movement Phase of that final counted Round.

Bands 6

A Character at Range Band 6 or greater cannot change Range during a battle.

RANGE BANDS

Range	
0 Contact	
1 Vshort 5 m	 Coin
2 Short 50 m	 Cards
3 Medium 150 m	 Book
4 Long 500 m	 Suitcase
5 Vlong 1000 m	 Person
6 Distant 5000 m	 Truck
Horizon	

VEHICLE MOVEMENT

Bands 0-1-2

Vehicles cannot move closer than Range Band 3 unless directly approaching the Attacker. They may move one Band per Round between Bands 0 - 1 - 2.

Bands 3-4-5-6

A vehicle at Speed=2 can spend Rounds equal to the destination Band and then move one Band between Bands 3 - 4 - 5 in the Movement Phase of that final counted Round.

A Vehicle at Speed=3 or greater can move one Range Band per Round.

FLYERS

A Flyer may maintain Range unchanged (the equivalent of Hover or Circling).

RANGE, SPEED, AND DISTANCE

Speed= Range=	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Range	Contact	Vshort	Short	Medium	Long	Vlong	Distant	VDistant	Orbit	Far Orbit
Distance		5 m	50 m	150 m	500 m	1000 m	5000 m	50 km	500 km	5000 km
Speed	Still	Walk	Run		Tracked	Wheeled	ACV			

Understanding Speeds. Humans (and most sophonts) Walk at Speed=1 and Run at Speed=2. The full array of Speeds is shown on the Vehicles Speed Chart.

The Combat Round

AN OVERVIEW

Combat is resolved in Combat Rounds.

Each Round moves through five Phases of activity. This sequence repeats with each new Combat Round.

Combat Round = about 1 Minute

Combat takes place in Rounds. Some seem like seconds; some seem like hours. Some pass without anything happening; others are flurries of activity.

At the end of combat, count the number of Rounds and equate them generally to minutes (a ten Round fight probably took about ten minutes).

S T A M P

Situation - Target - Attack - Move - Penetrate

THE FIVE COMBAT ROUND PHASES

1	**S**	**SITUATION**	The Attacker notes current Situation. Situation affects how he may attack. He notes his Weapon and may change Weapon at this Step.	
2	**T**	**TARGET**	The Attacker identifies a Target (one he can see or sense) and determines its Range, Size, and Target Mod.	Picking Targets reflects cooperation between the participants. Targeting can be changed at the very last minute.
3	**A**	**ATTACK**	The Attacker uses (fires, shoots, launches) his weapon and rolls to see if it hit. Make a note if the attack hit.	Most Attackers shoot at only one target; Suppression allows attacking multiple targets.
4	**M**	**MOVE**	The attacker may Move or perform any important action. He can change his status. He can move even if he has been Hit.	Movement can include Important Actions.
5	**P**	**PENETRATE**	The effects of any Hits are determined: if the attack penetrated armor or protection, any damage, wounding, or injury is noted.	All final activity in the Round occurs here.

Who Goes First?

STAMP governs the actions of each participant in combat. Each of the Phases is completed by everyone involved before play proceeds to the next Phase. It helps for the Referee (or someone in charge) to call out “End Of <Phase Name> Phase!” when every one is done.

Controlling Who Goes When. Within each Phase, everyone participates (targets, attacks, moves) more-or-less at the same time. Nevertheless, it helps for participants to play in some sequence. Someone must volunteer to go first; if no one volunteers, the Referee says, “Everyone hesitates. Next Phase.”

First Attacker

The first participant to make an attack in the Attack step is subject to the First Attack Mod +1; every attack against the First Attacker is slightly easier. If the attack by the First Attacker succeeds, that Target cannot fire in the current Attack step.

Suppression

A Machinegun may be allocated to Suppression. The attacker specifies Suppression. It attacks every enemy who makes an attack during the Round, but may not initiate an attack.

The Nuances of Combat

AN OVERVIEW

There are many exceptions and special situations in Combat.

Surprise

The side which begins Combat starts with Status=0.

Other potential participants have Status=+2. They shift to Status= 0 in the Round after being attacked.

Aiming

A Weapon can target any object with Size equal or greater than Range.

Gun Targets

Cannon, AutoCannon, and Gatling (but not Guns) cannot attack TSM less than 2.

First Attacker

The first participant to make an attack in the Attack step is subject to the First Attack Mod +1; every attack against the First Attacker is slightly easier. If the attack by the First Attacker succeeds, that Target cannot fire in the current Attack step.

KO Knockout

The traditional hit-on-the-back-of-the-head attack renders the target unconscious.

The Target must be Status= +1 or greater and head unarmored. The attack uses a hand (or manipulator) and delivers a Blow effect at Contact range. The automatic result is Unconscious for 2D Rounds.

QK Quick Kill

An overwhelming attack kills the target.

The Target must be Stats= +1 or greater and unarmored. The attack uses a weapon at Contact whose total possible hits equals or exceeds the target's Physical Characteristics C1+C2+C3. The automatic result is death.

Suppression

A Machinegun may be allocated to Suppression. The attacker specifies Suppression. It attacks every enemy who makes an attack during the Round, but may not initiate an attack.

Projectors

A Projector attacks all enemy targets in the specified Range Band. For a Projector, TSM= 0 and Status=0.

Reloading

Ammunition for weapons is counted in Loads. Specific ammunition counting is not required and Reloading is automatic if Speed= 1 or less.

Most weapons require reloading after three Rounds of firing.

Launchers Load= one Shot.

Multi-Launcher Load = three Shots.

MachineGuns. Notice that MachineGuns automatically reload if Still or Walking.

Energy Projectors do not require reloading within the context of a battle.

Spray Projectors Load= 3 Shots.

Remotes

A Remote weapon is emplaced at a location and slaved to an operator's Designator. When the Designator is fired, the Remote automatically aims at the location marked by the Designator.

Triggered Operation. Designator fires at the Target. If it hits, then in the next Round, the user may Trigger the Remote weapon, which fires at the designated target.

Automatic Operation. Designator fires at the Target; the Remote automatically fires at the same time.

A Designator must Hit, but need not Penetrate. If the Designator misses, then the Remote misses.

FN. The FN for a Remote depends on its installation.

FN = Char + Skill

Char = Weapon Quality (if not known, = 2D-2).

Skill = Installation.

To Install A Remote Weapon

2D < Dexterity + (Fighting or Ordnance)

Installation = Assets minus Die Roll.

Anti-Designators

An Anti-Designator weapon (if On) senses the operation of a Designator, automatically targets the Designator, and alerts the Operator. Firing the Anti-Designator completes the attack.

Slaves

A Slave Weapon is a weapon installed in a Slave Vehicle. Slaved weapons fire automatically at a target hit by a Designator.

Vehicle Speed

Speed above 2 is a Negative Mod (makes the vehicle harder to hit) except, if the vehicle is travelling directly Toward or Away from the Attacker (then Mod = 0).

COLLISIONS

A collision inflicts Damage equal to:

D= Tons * Speed^2

Tons= Volume Tons of the **other** vehicle.

Speed. If the crash is head-on, use the sum of the two speeds. If the two vehicles are at angles to each other, use the greater speed. If the two vehicles are travelling in the same direction, use the difference between the two speeds.

Useful Tonnage Calculation. To convert Sophont Size (Human= 100) to tons (displacement Tons = 13.5 cubic meters), divide by 20,000.

INDIRECT FIRE

Some weapons can attack targets which are not directly in their line of sight. This Indirect Fire involves Artillery (high arcing shots which descend on the target), Ortillery (shots dropped from orbit on a target), or Bombing (shots dropped from flyers on a target). In most cases, Indirect Fire is controlled by a Forward Observer.

BATTLEFIELD EFFECTS

Some effects on the battlefield are not the deliberate result of enemy attacks: they just happen: Mines, random artillery attacks, random bombing. The Battlefield Effects Charts show the effects of casual (or deliberate) weapons on the battlefield, including Weapons of Mass Destruction.

ENVIRONMENTAL EFFECTS

The effects imposed by weapons can also be imposed by the environment. The Environment Effects Charts show common environmental situations and how they can inflict damage on characters and equipment.

Fighting

The capabilities of weapons are reflected in their controls. These charts determine the controls to be expected on weapons.

VEHICLE HIT LOCATIONS

Comms	2
Cargo	3
Sensors	4
Protections	5
Life Support	6
Locomotion	7
Power Source	8
Body Panels	9
Weaponry	10
Navigation	11
Computer	12

Use this table for vehicles.

SOPHONT HIT LOCATIONS

A	Head	2
A	Head	3
C	LG-2	4
D	LG-1	5
B	Torso	6
B	Torso	7
B	Torso	8
E	LG-3	9
F	LG-4	10
G	Tail	11
G	Tail	12

Use this table for non-humans; it may need to be adapted.

HUMAN HIT LOCATIONS

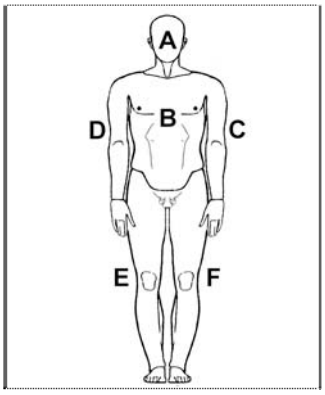
A	Head	2
A	Head	3
C	L Arm	4
D	R Arm	5
B	Torso	6
B	Torso	7
B	Torso	8
E	L Leg	9
F	R Leg	10
G	Graze	11
G	Graze	12

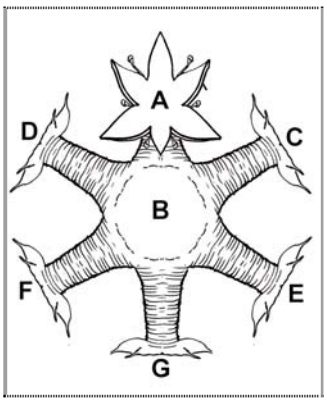
Use this table for humans.

BIOLOGICAL HIT LOCATIONS

Brain	2
Senses	3
Circulation	4
Skeleton	5
Respiration	6
Skin	7
Digestion	8
Elimination	9
Muscle	10
Skin	11
Skin	12

Use this table for Infections.





The Battle Damage charts show useful alternatives to these tables based on object size and function.

WEAPONS SKILLS AND CHARACTERISTICS

Based on Weapon Used:	Skill	Characteristic
Portable	BattleDress	+ Dexterity
Fixed, Tank Mount	Artillery	+ Intelligence
Gun, Gatling	Artillery	+ Intelligence
Cannon, Autocannon	Artillery	+ Intelligence
Launcher	Launcher	+ Dexterity
Laser, Fusion, Plasma	Beams	+ Dexterity
Acid, Fire, Gas, or Stench	Sprays	+ C2
Shock, EMP, Rad, Flash	Exotics	+ C2
Freeze, Mag, Sonic, Grav	Exotics	+ C2
Psi Amp	Exotics	+ Psi
Edged Weapons	Blades	+ Strength
Hand-to-Hand	Unarmed	+ Strength
Designator	Fwd Observer	+ Dexterity
Fires Bullets *	Slug Thrower	+ Dexterity

*and not otherwise assigned.

Bay Weapon	Bay Weapons	+ Intelligence
Turret	Turrets	+ C2
Ortillery	Ortillery	+ C5
Spines	Spines	+ C5
Hand Thrown Explosives	Athlete	+ Str
Or	Explosives	+ Str

Battle Damage

Battle Damage disables vehicles and equipment. Depending in its severity, it may be able to be repaired.

L1 DAMAGE LOCATION -1

2D	Vehicle	Ship	Hvy Weapons	Armor	Organic: Anatomical	Organic: Biological
2	Comms	Bridge	Controls	Controls	Head	Brain
3	Cargo	Hold	Mount	Interior	Head	Senses
4	Sensors	Sensors	Sights	Visor	Limb-Group-1	Circulation
5	Protections	Protections	Shields	Protections	Limb Group-2	Skeleton
6	Life Support	Life Support	Stocks	Life Support	Torso	Respiration
7	Locomotion	Drives	Barrel	Legs	Torso	Skin
8	Power Source	Power Plant	Power	Power	Torso	Digestion
9	Body Panels	Hull	Frame	Torso	Limb Group-3	Elimination
10	Weaponry	Weaponry	Ammunition	Manipulators	Limb Group-4	Muscle
11	Navigation	Astrogation	Mechanism	Navigation	Graze	Skin
12	Computer	Computer	Computer	Computer	Graze	Skin

Anatomical locations are injuries; biological locations are illnesses or infections.

L2 DAMAGE LOCATION -2

1D	Device	Tool	Weapon
1	Case	Case	Frame
2	Power	Power	Ammunition
3	Input	Adjuster	Sights
4	Output	Toolhead	Barrel
5	Controls	Grip	Grip
6	Processor	Safety	Mechanism

S SEVERITY

1D	How Severe?
1	Easy 1D
2	Average 2D
3	Difficult 3D
4	Formidable 4D
5	Staggering 5D
6	Hopeless 6D

Immediate Action (Damage Control)

For any malfunction, identify the appropriate skill and

Check Skill (2D)

Success converts Severity to Easy 1D and the device remains operable (but a result of 12 is automatic failure).

THE MALFUNCTION

The Referee determines the details of the malfunction. Some information is dictated by the situation; the remainder is generated from the charts. The three details of a malfunction are Location, Severity, and Diagnosis.

Location. Roll 2D on the Location Table appropriate to the device or person.

Severity. Roll 1D on the Severity Table. The result is the difficulty of the repair task.

Diagnosis. Roll 1D again on the Severity Table for the separate difficulty of the diagnosis task.

At the end of the process, the Referee knows where the problem is, the difficulty of its repair task, and the difficulty of its diagnosis task. For example,

Sensors, Difficult Repair, Easy Diagnosis,

Navigation, Easy Repair, Staggering Diagnosis.

Until the Diagnosis is successful, the repair task cannot be attempted.

WHAT WENT WRONG?

Characters determine the details of the malfunction using the diagnosis process.

Fault Diagnosis

The characters first diagnose the problem (which may not be obvious). Difficulty = Diagnosis Severity.

To diagnose why this object doesn't work.
Difficulty (nD) < Int
Uncertain (Difficulty minus 3).
Anyone may try to diagnose a fault.

Difficulty (nD) < Int + Skill + Diagnostic Tools
Uncertain (Difficulty minus 1).

Apply Mod +1 for each successive diagnosis attempt.

LET'S FIX IT

Using the diagnosis, the appropriate components are replaced or repaired.

To replace a malfunctioning component
Severity (nD) < Int + Skill +1
Item must be available as a spare.

To repair a malfunctioning component
Severity (nD) < Int + Skill
Uncertain (1D)

An ineffective or incorrect repair increases the Severity of the malfunction +1.

PICKING A SKILL

Various characters can volunteer that a particular skill applies to the diagnosis and repair. Obviously wrong skills can be dismissed (the character says: "I don't understand this thing."). Proper or appropriate skills are used (with negative Mods as appropriate.

USEFUL SKILLS

Biologics
Craftsman
Electronics
Fluidics
Gravitics
Magnetics
Mechanic
Photonics
Polymers
Programmer

Medical

Behind-The-Screen Damage

A procedure for generating consequences for dangerous situations not otherwise covered by existing rules.

BTSD

Referees occasionally encounter dangerous situations not otherwise covered by the general body of rules. They must, in such circumstances, create the results quickly and reasonably. BTSD allows a referee to roll dice using a single procedure to produce rational results with a minimum of preparation.

BTSD is rolled secretly (Behind The [Referee's] Screen) when rules do not otherwise cover the situation, or when time is short. It produces results that can be quickly and easily interpreted and imposed.

Assumptions. BTSD assumes that a situation has come out negatively, and that the character faces potential consequences in the form of injury or wounding, or that an object or piece of equipment faces some level of damage.

Using Bad Flux: Bad Flux is a variant of Flux which produces only negative results (average - 2, ranges from - 1 to - 5). Roll 2D and subtract the larger result from the smaller result.

With Negative Focus. BTSD concentrates on negative consequences; once consideration moves to BTSD, the best that can occur is a "no-result."

MODS TO BTSD

BTSD is eligible for various Mods. The spirit of BTSD allows only minimal Mods.

FOR EXAMPLE

Eneri and Aia are racing across a solidified lava plain just after the adjacent volcano begins an unexpected eruption. Hot ash is falling all around, and it is impossible for them to complete their dash to the safety of their ATV without some consequences. There isn't time for the Referee to make up falling ash rules, and he doesn't want to be arbitrary in imposing damage. He decides that each of the two is subject to one possible injury. He turns to BTSD and selects two dice.

Eneri is wearing ordinary clothing and receives no Mods. The Referee rolls 2 and 1. Subtract the larger from the smaller for a result of -1. Eneri suffers a slight wound.

Aia is wearing Mesh (= heavily clothed) and receives Mod +1. The Referee rolls 4 and 1. Subtract the larger from the smaller for a result of -3; Mod +1 gives a final result of -2. Aia receives a Light wound.

The ATV. The Referee decides the ATV is also subject to possible damage. The Referee rolls 6 and 6. Subtract the larger from the smaller for a result of 0. The ATV suffers a Scratch of no particular consequence (the characters can probably buff that out later).

BTSD Behind-The-Screen-Damage

Roll	Wound	Damage	N	N%
-7	Complete	Total	0	0%
- 6	Disastrous	Near Total	0	0%
- 5	Very Heavy	Very Heavy	2	6%
-4	Heavy	Heavy	4	11%
-3	Common	Common	6	17%
-2	Light	Light	8	22%
-1	Slight	Surface	10	27%
0	Scratch	Scratch	6	17%
+1			0	0%
+2			0	0%
+3			0	0%
+4			0	0%
+5			0	0%
+6			0	0%

Wounding applies to characters. **Damage** applies to equipment.

BTSD Mods

Mod	Protections	Actions
-7		
- 6		
- 5		
-4		
-3		
-2		
-1		
0	Typical	Typical
+1	Heavily Clothed	Dodging
+2	Armored	
+3	Heavily Armored	
+4		
+5		
+6		

Protections apply to clothing or equipment; Actions apply to movement or position.

	Vehicle Name
	Model / LongName (Bulk - Motive - Mission - Type -User - TL)

Vx: VEHICLE EXTENSION

	Tons	Speed	Load	Stage	Environ	Endurance	QREBS	Options
Vx:	Tons=	Speed=	Load=					

The basic information required to use a vehicle.

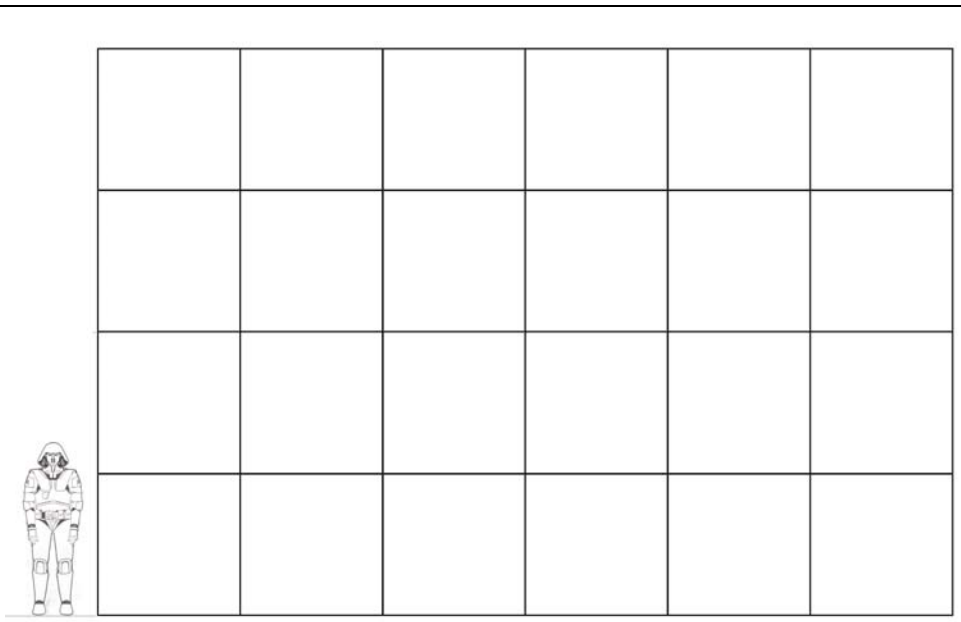
Wx: WEAPON EXTENSION

	Range	Cost	Mass	QREBS		Effect1	Effect2	Effect3
Wx:	R=	Cr	kg					

The basic information required to use a weapon mounted on a vehicle.

HIT LOCATIONS

Comms	**2**
Cargo	**3**
Sensors	**4**
Protections	**5**
Life Support	**6**
Body Panel	**7**
Power Source	**8**
Locomotion	**9**
Weaponry	**10**
Navigation	**11**
Computer	**12**



Paste any **Traveller** vehicle image here. Include a human figure for scale.

ARMOR / PROTECTION

Armor	
Cage	
FlashProof	
RadProof	
SoundProof	
PsiShield	
Insulated	
Sealed	

COMMENTS

Q	R	E	B	S	Period	Age

Weapons

Weapons are the tools that characters use for personal protection, for hunting, and for violence in pursuit of personal, corporate, and governmental goals.

Weapons are a natural consequence of, and element of, any tool-using sophont society: they are used (ideally) in situations that have escalated beyond non-violent personal interactions.

UNDERSTANDING WEAPONS

Weapons are devices designed to inflict Effects (damage, injuries, wounds, destruction) on targets.

Each weapon has LongName which generally describes its principles and construction, and a Model which is an abbreviation of the LongName.

With an understanding of the principles of Weapons, Armor, Vehicles, and Combat, players can generally understand the relative worth of weapons from their LongNames and Models.

Types of Weapons

Traveller Weapons are differentiated by Type: there are seven different Types of Weapons based more or less on function.

A **Gun** is a relatively large projectile- or energy-firing artillery weapon created for distinctly military purposes.

A **Rifle** is a personal long-arm used by soldiers and by sportsmen.

A **Pistol** is a personal handgun intended to be operated with one hand.

A **Shotgun** is a personal long-arm firing a group of shot pellets rather than single bullets.

A **Machinegun** is a military weapon firing multiple bullets in bursts with each pull of the trigger.

A **Projector** utilizes non-traditional technology not ordinarily or otherwise encountered.

A **Designator** marks or illuminates potential targets so that other weapons may attack them.

A **Launcher** ejects or launches self-propelled projectiles at a target.

USING WEAPONS

Weapons have Effects which inflict hits, wounds, injuries, or damage under the V1 or V2 hit systems.

The Hit System V1. The Basic Hit System (version 1) provides a simple hit mechanic for resolution of combat. V1 is intended for use with non-player characters (and especially hordes of NPCs) when speed of resolution is important.

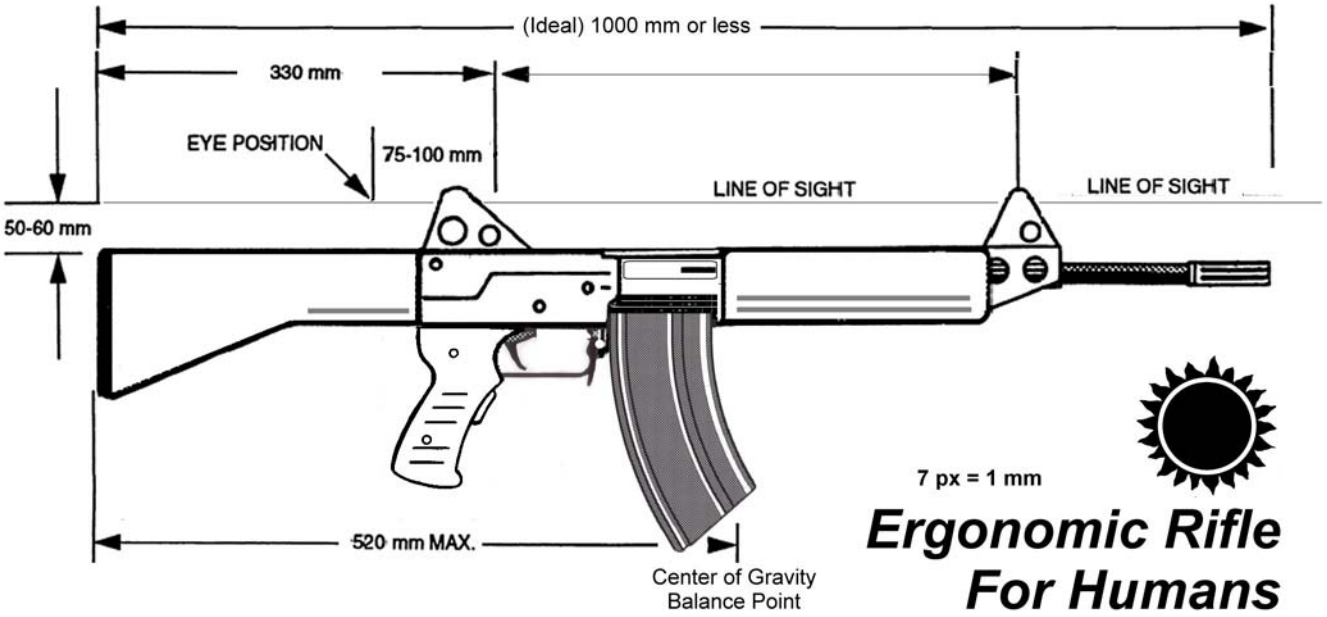
The Hit System V2. V2 Damage inflicts different types of damage based on the specific weapon.

CREATING WEAPONS

Weapons can be created randomly, or by design.

Random Creation. The **GunMaker** system produces weapons based on die rolls. Randomly created weapons can be used in a variety of encounters with adversaries, or to define trade goods.

Design. Weapons can be designed by substituting selections for die rolls in the Gunmaker system.



WEAPON DESCRIPTION

Model	LongName (Stage-Burden-Descriptor-Type-User-Portability-TL)
SnAC-8	Sniper (blank) Assault Carbine-8

The basic information required to describe a weapon.

Wx: WEAPON EXTENSION

	Range	Cost	Mass	QREBS	Effects		
Wx:	R=5	Cr1200	2.6 kg	B= 0	Bang-1	Blast-2	Bullet-1

The basic information required to use a weapon.

DESCRIBING WEAPONS

Weapons can be described in many ways depending on the printed format required: any format is possible as long as it provides the information necessary for the situation.

The Weapon Description

Weapons are described in a series of elements to form the LongName or abbreviated to form the Model. The LongName or Model contains enough information to allow a character to describe a weapon.

The LongName consists of the following elements:

Stage - Burden - Descriptor - Type - User - Portability - TL

Stage is the weapons' position in the spectrum of sophistication in the developmental life cycle. It is possible for Stage to be blank. For example, Prototype, Basic, or Advanced.

Burden identifies the relative weight, mass, or bulk of the weapon. It is possible for Burden to be blank. For example, Vlight, Light, Heavy, or Vheavy.

Descriptor elaborates on combat purpose, size, or the form of energy or injury it inflicts. It is possible for the Descriptor to be blank. For example, Laser or Survival.

Type identifies the basic function of the weapon. For example, Carbine. Type is required.

User identifies the intended or designed user, either by sophont, or by manipulator. Blank assumes the user is Human or Man or Hand. For example, Man, Hiver, Tentacle, or Gripper.

Portability identifies the relative size of the weapon.

Tech Level identifies the Technological Level at which the Weapon is commonly manufactured. TL is required.

The **Identifying Weapons Chart** shows the various component names and abbreviations.

Elements of a LongName not necessary for a proper understanding may be omitted; User and Portability are often omitted for basic weapons.

Model. LongName elements have abbreviations which are used to create the weapon Model.

Model is a jargon abbreviated Longname. Once a character is familiar with a specific weapon, references to it devolve to its abbreviation. P-5 is a Tech Level 5 Pistol. When used, Stage and Burden may be enclosed in parens to increase comprehension (some familiarity is required before players can quickly understand aFmLC-12).

Given the restrictions of the alphabet, element abbreviations are not necessarily unique.

The Weapon Extension

The capabilities of a weapon are contained in the Weapon Extension. This string of values details enough information to allow a character to use a weapon. The Weapon Extension is a variable length string: only such information as is needed is included.

The Prefix. The Weapons extension begins with the prefix Wx:

The Elements. Following the prefix, the Weapons Extension includes

Wx: Range - Cost - Mass - qreBs - Effects

Range (R=N) is the maximum effective range of a weapon. Beyond this range, it is impossible to hit a reasonable target. Some weapons have options which increase this Range.

Cost. The cost of the weapon in Credits.

Mass. The mass (more-or-less the weight) of the weapon expressed in kilograms (unless otherwise identified).

QREBS. The QREBS values for the weapon (if known). Various formats are used to identify specific QREBS values, and care must be taken to avoid confusion with Range if Reliability is shown.

Effects. The Hit System effects inflicted by the weapon.

DESIGNING WEAPONS

Weapons are designed using the Weapons Fillform. The Fillform guides the designer through the process with spaces for information and references to the applicable charts.

DELIBERATE DESIGN

The deliberate design process begins with a blank Weapons Fillform. In each step, the Chart Number indicates the Weapons Chart from which the information is selected.

Chart 1 Identifying Weapons, and Chart 2 Weapon Design may be consulted, but are not actually used in Deliberate Design.

These steps include:

Chart 2. Weapon Design FillForm.

Prepare a blank Fillform for the weapon design.

Chart 3. Weapon Type

Select weapons **Type** and **SubType**. Record Model, TL, Range, Mass, qreBs (Burden), H1 (Weapon Effect) and D1 (Effect Dice), and Cost.

Chart 4. Descriptor

Based on the Weapon Type, select the Weapons **Descriptor.** Record TL, Range, Mass, qreBs (Burden), H2 and D2, and H3 and D3, and Cost.

Range. Note that a non-zero Range under Descriptor supersedes Range under Category and Type (cross out Category and Type Range).

Mass. Mass is a multiplier. Entries from this chart should be preceded by x (a times sign).

Chart 5. Burden

Select an appropriate **Burden** and record its TL, Range, Mass, qreBs (Burden), Miscellaneous (usually Mods to QREBS), D2 (Mod to D2), and Cost. Observe the requirements under Comment.

Mass. Mass is a multiplier. Entries from this chart should be preceded by x (a times sign).

Chart 5. Stage

Select an appropriate **Stage** and record its TL, Range, Mass, qreBs (Burden), Miscellaneous (usually Mods to QREBS), D2 (Mod to D2), and Cost. Observe the requirements under Comment.

Mass. Mass is a multiplier. Entries from this chart should be preceded by x (a times sign).

Chart 6. Weapon Special Effects

Review the Weapon Type, Descriptor, and Burden for applicable notes and record this information.

Chart 7. Options

Review the available options and note those selected.

Record the QREBS drawbacks from the Weapons Options.

Chart 5. User

Select an appropriate **User** and record its TL, Range, Mass, qreBs (Burden), and Miscellaneous (usually Mods to QREBS). Observe the requirements under Comment.

Chart 8. Weapon Controls

Review the Weapon Type and note the assigned controls. Review the Weapon Descriptor and add any additional controls.

Chart 5. Portability

Calculate the weight for the weapon. Using this value, determine the Portability for the weapon.

Totals

For each column, compute the totals. Tech Levels sum. Ranges sum. Some entries under Mass multiply. Burdens sum. Combine identical Effects and sum their hit dice. Some costs multiply.

Complete the QREBS entries with the calculated Burden (and add any other QREBS entries dictated by comments).

Finally

Create the Weapon Description and Weapon Extension.

RANDOM CREATION

The random creation process begins with a blank Weapons Fillform and the Random Weapon Creation Chart 9.

Using 1D and 2D as directed, roll for each element of the weapon on Chart 9 from **right to left** in the order:

Type (or SubType), Descriptor, Burden, and Stage.

Simple Weapons. A simple weapon can be created directly from the chart (Tech Levels are included).

Complete Weapons Descriptions. Using the information created from Chart 9, return to Deliberate Weapon Design and determine its details from the Charts.

Some Designs Are Impractical. Some combinations of elements may not make sense (Recoilless Laser) or may seem impractical (Vheavy Carbine). It is the Referee's responsibility to discard a design as nonsensical or to justify the design based on local sophont cultural preferences.

For example, the Carbine element of a Vheavy Carbine produces an EOU Mod not available in a Vheavy Rifle.

UNDERSTANDING THE WEAPON ELEMENTS

Each Element of a Weapon description has meaning. Once a weapon has been created, consult the supporting paragraphs for a better understanding of the weapon function and operation.

WEAPON TYPES

Weapons fall into eight distinct categories or types (there is occasional overlap between types) based on size, function, and use.

Guns

A **Gun** is a relatively large projectile- or energy-firing artillery weapon created for distinctly military (as opposed to hunting, recreation, or sport) purposes.

Includes Gatling, Cannon, and AutoCannon. Gatling is a multiple barrel and higher rate of fire version of a **Gun**. **Cannon** is a larger version of a **Gun**. **AutoCannon** is a higher rate of fire version of **Cannon**.

Weapons in Category = Gun are capable of Indirect Fire.

Category = Gun is considered Artillery.

Rifles

A **Rifle** is long-arm used by soldiers in combat and by sportsmen in pursuit of game. A rifle is a stable and relatively accurate weapon, and although the term “rifle” implies spiral grooved barrels which spin stabilize projectiles, that feature is not necessarily present.

Includes Carbine. A Carbine is a shorter version of the Rifle usually created to save weight or reduce size.

Alternative terms for Rifle include Fusil and Musket.

Pistols

A **Pistol** is a personal handgun intended to be operated with one hand. In this context, a pistol is semi-automatic (or self-loading). Less accurate and shorter-ranged than a Rifle, a Pistol offers considerable savings in mass and size.

Includes Revolver. A Revolver is a special type of Pistol using a multiple chambered cylinder instead of a magazine.

Shotguns

A **Shotgun** is a long-arm firing a group of shot pellets rather than single bullets (but see **Splat** under Descriptors).

Machineguns

A **Machinegun** is a military weapon which fires multiple bullets in bursts with each pull of the trigger. Firing more bullets theoretically means the weapon can do more damage.

Projectors

A **Projector** is a weapon which utilizes non-traditional technology not ordinarily or otherwise encountered. An alternative term is Projac.

Designators

A **Designator** is a device which marks or illuminates targets (or potential targets) so that other weapons may engage or attack them. Although a Designator is not itself intended to be a weapon, it may inflict harm when in use.

Forward Observers use Designators to illuminate or mark a Target so that it can be attacked by Artillery.

Launchers

A **Launcher** is a device which ejects or launches self-propelled projectiles which then proceed to the target.

A Launcher can fire missiles (guided) or rockets or grenades (unguided).

Includes Multi-Launchers. A Multi-Launcher is a refinement of a Launcher to allow multiple uses before reloading.

WEAPON DESCRIPTORS

Descriptor is a statement of the specific mechanism, purpose, or effect the weapon may have. When paired with a Weapon Type, it provides a basic statement of a weapon and its function.

A Descriptor may apply to several different types of weapons, but Descriptors are not necessarily used with every Weapon Category.

(blank). The weapon has no modifications or effects based on Descriptor.

Accelerator. The weapon fires a projectile at a low initial velocity; after it leaves the barrel, an internal charge accelerates the bullet to greater velocities. Accelerator weapons have low recoil and are well adapted to zero-G environments. For example, Accelerator Carbine.

Acid. The weapon discharges acid at the target. For example, Acid Projector.

Anti-Flyer Missile. The weapon launches a missile which attacks Flyers. Anti-Flyer Missiles are guided. For example, Anti-Flyer Missile Multi-Launcher.

Anti-Flyer. The weapon is intended for use against Flyers, typically through a higher rate of fire than similar weapons. Anti-Flyer refers to some aspect of the weapon’s operation (as distinct from Anti-Flyer Missile). For example, Anti-Flyer Gatling.

Anti-Tank. The weapon is intended for use against Tanks and other armored vehicles; it may reasonably be used against any vehicle. Anti-Tank refers to some aspect of the weapon’s operation (as distinct from Anti-Tank Missile). For example, Anti-Tank AutoCannon.

Anti-Tank Missile. The weapon launches a missile which attacks Tanks or other Armor. For example, Anti-Tank Missile Multi-Launcher.

Assault. The weapon is designed for use on the battlefield by soldiers. It is characterized by an ability to hit person - size targets at moderate ranges (Range 4 = 500 meters) and by bullets and explosive projectiles. For example, Assault Rifle.

Auto. An abbreviation for Automatic and another term for Battle (used about half the time). When a weapon is designated Battle by the tables or by design, Auto may be used instead. For example, a Battle Rifle may also be called an Auto Rifle.

Battle. The weapon is designed for use on the battlefield by soldiers. It is characterized by an ability to hit -person size targets at the limit of unaided vision (Range 5 = 1000 meters). For example, Battle Rifle.

Combat. The weapon is designed for use in combat by soldiers. It is characterized by an ability to hit person - size targets at relatively short ranges (Range 3 = 150 meters) using explosive projectiles. For example, Combat Rifle.

Dart. The weapon fires a small injector projectile which, on contact, injects a Tranq dose into the target. For example, Dart Rifle.

EMP. The weapon fires a directed electromagnetic pulse which fries electronic circuits and Ablinds sophonts who have Awareness. For example, EMP Projector.

Fire. The weapon fires or projects flame or fire at the target. For example, Fire Projector (the equivalent of a Flame Thrower).

Flash. The weapon fires a bright, blinding flash of light. For example, Flash Projector.

Freeze. The weapon induces an entropic effect, removing heat from the target. For example, Freeze Projector.

Fusion. The weapon superheats hydrogen fuel to a plasma state and retains it briefly (to allow progression to the fusion state). It fires its beam through a magnetically focused field along the weapon's barrel. The initial beam is approximately 2 cm, but it begins to expand immediately. Fusion weapons have a greater range than Plasma weapons.

Fusion weapons have significant recoil.

For example, Fusion Gatling.

Gauss. The weapon electromagnetically accelerates a projectile and spin stabilizes it through magnetic effects. For example, Gauss Rifle.

Grav. The weapon projects a high frequency gravitic effect onto the target; this rapid gravitic pushing and pulling reduces internal structural strength in objects and induces organic damage in beings. In addition, this weapon effect shuts down grav equipment. For example, Grav Projector.

Grenade. The weapon fires an explosive projectile. For example, Grenade Launcher.

Hunting. The weapon is adapted to game hunting situations. For example, Hunting Rifle.

Laser. The weapon fires a coherent beam of photons at the target. For example, Laser Designator.

Mag. The weapon projects a high frequency magnetic effect onto the target; this rapid magnetic pulsing scrambles electronic circuits and induces temporary disorientation in organic beings. In addition, this weapon effect shuts down magnetic equipment. For example, Mag Projector.

Missile. The weapon fires a missile which is guided to the target. For example, Missile Launcher.

Plasma. The weapon heats hydrogen fuel to a plasma state and fires it as a beam through a magnetically focused field along the weapon's barrel. The initial beam is approximately 2 cm, but it begins to expand immediately.

Plasma weapons have significant recoil.

For example, Plasma Gun.

Poison Dart. The weapon fires a small pointed projectile which, on contact, injects a Poison dose into the target. For example, Poison Dart Carbine.

Poison Gas. The weapon projects a poison gas at the target. For example, Poison Gas Projector.

Psi Amp. The weapon amplifies the natural psionic ability of the user. For example, Psi Amplification Projector.

Rad. The weapon projects radiation effects at the target. For example, Rad Projector.

RAM Grenade. The weapon fires an explosive projectile which has extended range (RAM= Rocket Assisted Munition). For example, RAM Grenade Launcher.

Rocket. The weapon fires an unguided rocket at the target. For example, Rocket Multi-Launcher.

Shock. The weapon applies an electric shock to the target. For example, Shock Projector.

Sonic. The weapon projects a sound-based effect at the target (as distinct from the sound some weapons make when firing). For example, Sonic Projector.

Splat. The weapon is a multi-barrel slightly diverging configuration, with each barrel loaded with several projectiles (and associated propellant). Each use fires one projectile in each of the barrels. For example, Splat Gun.

Splat is distinct from Shotgun: Splat is a multi-barrel multi-projectile Rifle or Carbine.

Stench. The weapon projects a strong foul-smelling or obnoxious effect at the target. For example, Stench Projector.

Sub. The weapon configuration uses smaller (or less powerful) ammunition than normal, resulting in lighter weight and somewhat less power. For example, Sub Machinegun.

Survival. The weapon is adapted to use in survival situations. For example, Survival Rifle.

WEAPON BURDEN

Burden is the spectrum of effects based primarily on weight, mass, and bulk.

(blank). The weapon has no modifications or effects based on Burden.

Anti-Designator. The weapon senses the marking or illumination effects emitted by a Designator. The weapon can sense the Designator's trigger signal and fire automatically, or can fire at the user's command.

Body (applies only to Pistols and Revolvers). The Pistol or Revolver is light-weight and ergonomically designed.

Disposable. The weapon is manufactured from inexpensive materials to reduce cost; it has a usable lifetime measured in days.

Heavy. The weapon is significantly heavier than the standard weapon, but has greater range.

Light. The weapon is significantly lighter than the standard weapon and thus easier to carry, but at a reduction in range.

Magnum (applies only to Pistols and Revolvers). The Pistol or Revolver is heavier than standard and has greater range.

Medium (the term is often omitted). The weapon has no specific enhancements with the Burden classification.

Recoilless. The weapon is designed to have no recoil and is adapted to zero-G environments.

Snub. The weapon is specifically designed to be easy to carry and operate, but at a cost in range and effect.

Vheavy. The weapon is extremely heavy, but has longer range and inflicts greater damage.

Vlight. The weapon is extremely light, but at a reduction is range and effect.

VRF (Very Rapid Fire). The weapon has a very high rate of fire.

WEAPON STAGE

Stage is the spectrum of effects based on the technological product development cycle.

(blank). The weapon has no modifications or effects based on Stage.

Advanced. The weapon is significantly better than the standard version, and features lower weight and excellent ergonomic design. It inflicts increased damage.

Alternate. The weapon uses an alternate technology to achieve its effects.

Basic. The weapon is a stripped down design with greater weight and lower cost.

Early. The weapon is a preliminary design available through mass production with the bugs not yet worked out.

Experimental. The weapon is an early test model.

Improved. The weapon features small improvements.

Modified. The weapon features improvements.

Ultimate. The weapon represents the technological pinnacle of the design cycle.

Precision. The weapon is able to target a specific component of the target. A Precision weapon may specify (rather than roll) the result on a Hit Location Table.

Prototype. The weapon is a hand made model.

Remote. The weapon is designed to be emplaced or installed in a location at some distance from the operator, or emplaced to operate independently. Remote weapons are controlled by a Designator and traverse to track a target which is being designated. The operator can trigger a fire signal from the Designator.

Sniper (used only with Rifles). The weapon is optimized for accuracy at extended ranges.

Standard (often omitted). The weapon has no specific enhancements with the Stage classification.

Target (used only with Rifles and Pistols). The weapon is optimized for accuracy.

WEAPON USERS

User indicates the typical or intended user, either by species or by manipulator type.

(blank). The weapon has no modifications or effects based on User. The default user is Man or Human.

If no User is specified, the weapon is intended to be operated by a Human or similar being.

Universal. The weapon has compromise controls which are usable by most sophonts.

By Sophont

User may be described as a specific sophont.

Man. The intended user is Human (the military user term Man was adopted during the Second Empire to refer to Humans in general; although archaic in other uses, it is the accepted term here). The preferred manipulator is Hand.

Aslan. The preferred manipulator is Paw.

Hiver. The preferred manipulator is Grasper.

Vegan. The preferred manipulator is Tentacle.

K'kree. The preferred manipulator is the Hand.

Vargr. Rarely used. Vargr easily use human weapons. The preferred manipulator is the Hand.

Droyne. The preferred manipulator is the Hand.

Bwaps. The preferred manipulator is the Hand.

<Sophont>. The intended user is a specific Sophont, and various details are custom determined. For example, Plexxan (where Plexxan is a Sophont familiar to the characters, or otherwise described in available data bases).

By Manipulator

User may be specified by the manipulator it is crafted to fit: Hand, Graspers, Grippers, Paws, Sockets, Tentacles.

PORTABILITY

Portability is a measure of the ability of a weapon to be moved or carried.

(blank). The weapon has no modifications or effects based on Portability. If no Portability is specified, the weapon is intended to be a Personal weapon carried and used by one person.

Crewed. The weapon is commonly deployed and operated by a crew of two or more persons. A crew is necessary to carry the weapon and often it ammunition.

Semi-Portable. An alternative term for Crewed. Generally a large bulky weapon which can be carried by two or more persons, but once set up is rarely moved.

Fixed. The weapon is securely attached to an immovable base.

Portable (often Man-Portable). The weapon is designed to be operated by a user in BattleDress (or powered armor). This feature is dictated by the high recoil of the weapon, or by its mass.

Tank Mount. The weapon is mounted in a tank, armored fighting vehicle, or other vehicle (armored or not).

Turret. The weapon mounted in a standard turret on a starship or spacecraft.

WEAPON TECHNOLOGY LEVEL

The weapon Tech Level indicates the relative level of technological sophistication required for manufacture. Any world with the indicated Tech Level and appropriate machinery can produce this item.

QREBS

Any acquired weapon is ordinarily assumed to be QREBS=00000 (no effects under QREBS system).

If the Weapon Design System imposes any QREBS elements (for example, B= -2), that imposed element applies to the weapon.

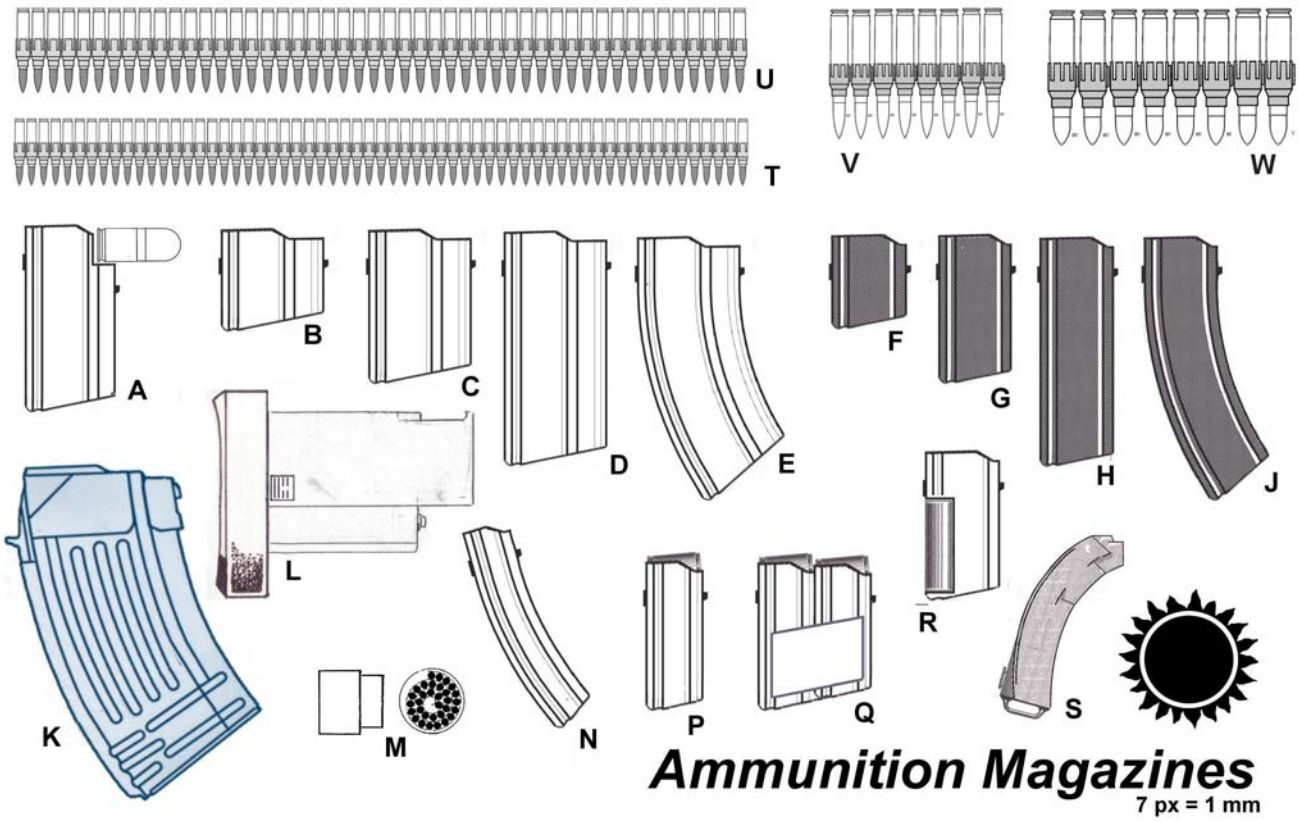
As Issued. A weapon with only the imposed QREBS elements is considered **As Issued**. It is typical of the weapon as used in service. Most weapons are in this state, and any reasonable character can research and determine this information.

Used. Any character may ask for a **Used** weapon instead. The Referee then evaluates the weapon under QREBS and records this information.

For example, a Eneri Dinsha has acquired a Prototype Vheavy Gauss Carbine with QREBS Burden -5. The other elements are all zero. In an attempt have a better weapon, he specifies it is Used. The Referee rolls for all five QREBS elements. -1 +2 -3 +4 -1. The +4 brings the existing Burden up to -1. The Used weapon becomes QREBS -1 +2 -3 -1 -1. Eneri is better served by looking for a better weapon.

AMMUNITION AND MAGAZINES

The creation or design of weapons assumes the creation of suitable ammunition and of magazines or cassettes that will feed munitions to the weapon. The weapon design does not delve into the process in that great a depth. This Ammunition Magazines Image provides some detail for various weapons.

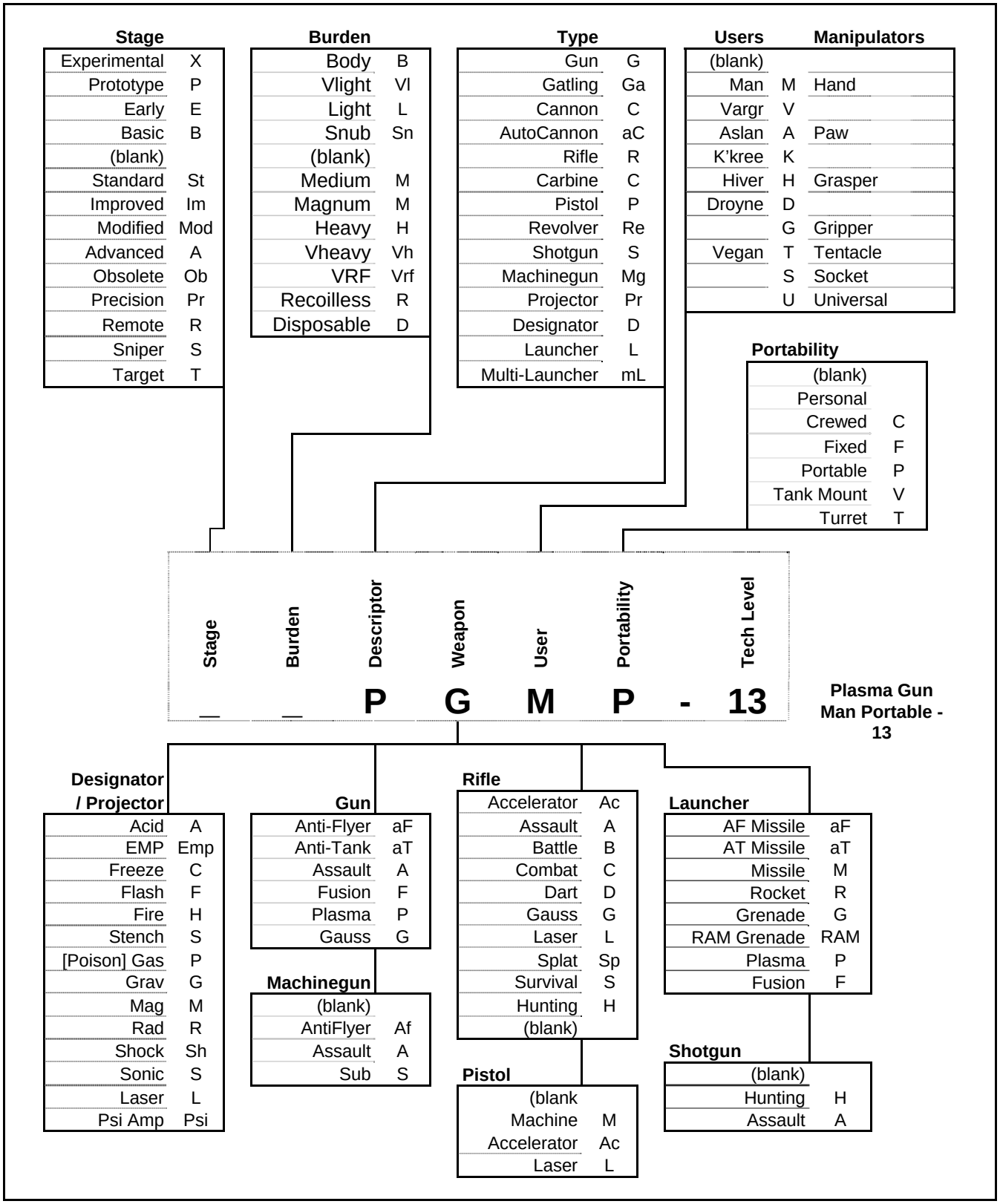


Typical Magazines for Typical Weapons. A. 30mm Grenade Launcher Magazine (= 4 rounds). B. 8mm Battle Rifle Magazine (= 10 rounds). C. 8mm Battle Rifle Magazine (= 20 rounds). D. 8mm Battle Rifle Magazine (=30 rounds). E. 8mm Battle Rifle Magazine Variant (= 30 rounds). F. 6mm Assault Rifle Magazine (= 10 rounds). G. 6mm Assault Rifle Magazine (= 20 rounds). H. 6mm Assault Rifle Magazine (=30 rounds). J. 6mm Assault Rifle Magazine Variant (= 30 rounds). K. 25mm Recoilless Zero-G Vheavy Carbine Magazine (= 12 rounds). L. 5 mm Bullpup Cassette (= 200 rounds plus binary propellant reservoir). M. 4mm Revolver Magazine (removable) (= 32 round internal spiral). N. 9mm Sub Machinegun Magazine (= 30 rounds). P. 15mm Shotgun Magazine (= 6 rounds). Q. 15mm Shotgun Double Column Magazine (= 12 rounds). R. 6mm Gauss Gun Magazine (includes high output power cell and 100-round bullet reservoir). S. 3mm StapleGun Magazine (= 200 rounds). T. 6mm Machinegun Ammunition Belt. U. 8mm Machinegun Ammunition Belt. V. 13mm (the archaic .50 caliber) Machinegun Ammunition Belt. W. 20mm Heavy Machinegun Ammunition Belt.

Identifying Weapons

Decode the elements describing weapons using this chart.

Weapons



Weapon Design

As the weapon is designed insert the design values and details into this Fillform. Values may be inserted in any order as the design is considered: the ultimate requirement is that the values balance and properly reflect the charts and tables.

Weapons 2

BUILDING WEAPONS

This Fillform allows an interactive design process which ultimately produces a final weapon design.

Tech Level. Tech Level for a weapon is the minimum level required for manufacture.

WEAPONS MANUFACTURER

Manufacturer			
Surface or Orbital Factory?	TL	LL	

WEAPONS

Chart	Item	Description	Q R E B S	Model	TL	Range	Mass	Burden	H1 H2	D1 D2	H3	D3	KCr 000,	Cr ,000
3	Type													
3	SubType													
4	Descriptor													
5	Burden													
5	Stage													
6	Notes	Recoil= Loud=												
		Flash= Heat=												
		Vacc= UW=												
		CQ=												
7	Options													
			Q R E B S											
5	User													
8	Controls													
5	Portability													
	QREBS= Totals													

WEAPON DESCRIPTION

Model	LongName (Stage-Burden-Descriptor-Type-User-Portability-TL)

The basic information required to describe a weapon.

Wx: WEAPON EXTENSION

	Range	Cost	Mass	QREBS	Effects		
Wx:	R=	Cr	kg	B=			

The basic information required to use a weapon.

Weapons

Select the Category and Type of Weapon from this Chart.

Weapons 3

WEAPONS TYPES

Weapons have eight distinct Categories (some with subordinate Types); there is occasional overlap:

Artillery	Destructive military weapons.	Includes Guns, Gatlings, Cannon, and AutoCannon.
Long Gun	Personal long arms typically used by soldiers.	Includes Rifles and Carbines.
Handgun	Firearms operated with one hand.	Includes Pistols and Revolvers.
Shotguns	Long arms firing shot pellets rather than single bullets.	
Machineguns	Military weapons firing multiple bullets in bursts.	
Projectors	Weapons which use non-traditional technologies.	
Designators	Devices which mark targets for attack by other weapons.	
Launchers	Devices which eject self-propelled projectiles.	Includes Launchers and Multi-Launchers.

CATEGORIES

Category	Code	Type	TL	Range	Mass	qreBs	H1	D1	Misc	Hits (v1)	Cr
Artillery	G	Gun	6	4	9	-1	*	2		2	5,000
	Ga	Gatling	7	4	40	-2	*	3		2	8,000
	C	Cannon	6	6	200	-4	*	4		2	10,000
	aC	Autocannon	8	6	300	-4	*	5		3	30,000
Long Guns	R	Rifle	5	5	4	0	Bullet	2	Not Bullet if Laser	2	500
	C	Carbine	5	4	3	1	Bullet	1	Not Bullet if Laser	1	400
Handguns	P	Pistol	5	2	1.1	0	Bullet	1	Not Bullet if Laser	1	150
	R	Revolver	4	2	1.25	0	Bullet	1	Not Bullet if Laser	1	100
Shotguns	S	Shotgun	4	2	4	0	Bullet	2		2	300
Machineguns	Mg	Machinegun	6	5	8	-1	Bullet	4		4	3,000
Projectors	Pj	Projector	9	0	1	0	*	1		1	300
Designators	D	Designator	7	5	10	-1	*	1		1	2,000
Launchers	L	Launcher	6	3	10	-1	*	1		0	1,000
	mL	Multi-Launcher	8	5	8	-1	*	1		0	3,000

* Hit Type is determined by other details of the weapon.

EFFECTS, ARMOR, AND DAMAGE

Code	Type	Effect	
A	Corrode	Armor	Hit
B	Bullet	Armor	Hit
C	Cut	Armor	Cut
D	Blast/Blow	Armor	Hit
E	EMP	EMCage	Fry
F	Frag	Armor	Hit
G	Gas	Sealed	Suff
H	Hot	Insulation	Heat
I	Infection	Sealed	Hit
J	Psi	PsiShield	Stun
K	Burn	Armor	Hit
L	Elec	Insulation	Hit
M	Magnetic		Stun
N	Bang	SoundProof	Deaf
O	Stench	Sealed	Stun
P	Pain	Armor+Sealed	Stun
Q	Cold	Insulation	Freeze
R	Rad	RadProof	Hit
S	Sound	SoundProof	Stun
T	Poison	Sealed	Hit
U	Flash	Flashproof	Blind
V	Vacc	Sealed	Suff
W	Wound	Armor	Hit
X	Pen	Armor	Hit
Y	Grav		Hit
Z	Tranq	Sealed	Stun

WEAPONS SKILLS AND CHARACTERISTICS

Based on Weapon Used:	Skill	Characteristic
Portable	BattleDress	+ Dexterity
Fixed, Tank Mount	Artillery	+ Intelligence
Laser, Fusion, Plasma	Beams	+ Dexterity
Gun, Gatling, Cannon, Autocannon	Artillery	+ Intelligence
Launcher	Launcher	+ Dexterity
Acid, Fire, Gas, or Stench	Sprays	+ C2
Shock, EMP, Rad, Flash	Exotics	+ C2
Freeze, Mag, Sonic, Grav	Exotics	+ C2
Psi Amp	Exotics	+ Psi
Edged Weapons	Blades	+ Strength
Hand-to-Hand, Martial Arts	Unarmed	+ Strength
Designator	Fwd Observer	+ Dexterity
Fires Bullets (and not otherwise assigned)	Slug Thrower	+ Dexterity

WEAPON RANGES

Range	Distance	Benchmark	
0	contact	contact	
1	Vshort	5 meters	coin
2	Short	50 meters	card
3	Medium	150 meters	book
4	Long	500 meters	suitcase
5	Vlong	1000 meters	person
6	Distant	5 km	truck (horizon typically here)
7	Vdistant	50 km	tower
8	Orbital	500 km	
9	Far Orbit	5000 km	

Weapon Descriptors

Weapons descriptors detail the specific mechanism, purpose, or effect that a weapon may have. Not all weapons types use all descriptors. A weapon may have one Descriptor.

DESCRIPTORS

Category	Code	Descriptor	TL	Range	Mass	qreBs	H2	D2	H3	D3	Hits (v1)	Cr
Artillery	aF	Anti-Flyer	+4	=6	x6.0		Frag	1	Blast	3	4	x 3.0
(includes	aT	Anti-Tank		=5	x8.0		Pen	3	Blast	3	6	x 2.0
Guns, Cannon,	A	Assault	+2	=4	x0.8		Bang	1	Blast	2	3	x 1.5
AutoCannon,	F	Fusion	+7	=4	x2.3		Pen	4	Burn	4	8	x 6.0
Gatling)	G	Gauss	+7	=4	x0.9		Bullet	3			3	x 2.0
	P	Plasma	+5	=4	x2.5		Pen	3	Burn	3	6	x 2.0
Long Guns		(blank)			x1.0							
(includes	Ac	Accelerator	+4		x0.6		Bullet	2			2	x 3.0
Rifles,	A	Assault	+2	=4	x0.8		Bang	1	Blast	2	3	x 1.5
Carbines)	B	Battle	+1	=5	x1.0	+1	Bullet	1			1	x 0.8
	C	Combat	+2	=3	x0.9		Frag	2			2	x 1.5
	D	Dart	+1	=4	x0.6		Tranq	1-2-3			1-2-3	x 0.9
	P	Poison Dart	+1	=4	x1.0		Poison	1-2-3			1-2-3	x 0.9
	G	Gauss	+7		x0.9		Bullet	3			3	x 2.0
	H	Hunting		=3	x0.9	-1	Bullet	1			1	x 1.2
	L	Laser	+5		x1.2		Burn	2	Pen	2	4	x 6.0
	Sp	Splat	+2	=4	x1.3	+1	Bullet	1			1	x 2.4
	S	Survival		=2	x0.5		Bullet	1			1	x 1.2
Handguns		(blank)			x1.0							
(includes	Ac	Accelerator	+4		x0.6		Bullet	2			2	x 3.0
Pistols,	L	Laser	+5	=4	x1.2		Burn	2	Pen	2	4	x 2.0
Revolvers)	M	Machine**		=3	x1.2		Bullet	2				x 1.5
Shotguns		(blank)			x1.0							
	A	Assault	+2	=4	x0.8		Bang	1	Blast	2	3	x 2.0
	H	Hunting		=3	x0.9		Bullet	1			1	x 1.2
Machineguns		(blank)			x1.0							
	aF	Anti-Flyer	+4	=6	x6.0		Frag	1	Blast	3	4	x 3.0
	A	Assault	+2	=4	x0.8		Bang	1	Blast	2	3	x 1.5
	S	Sub	-1	=2	x0.3		Bullet	-1			-1	x 0.9
Spray Designators	A	Acid		=3	x1.0	+1	Acid	2	Pen		4	x 3.0
And Projectors	H	Fire		=1	x0.9		Burn	1-2-3	Pen	1-2-3	2-4-6	x 2.0
	P	Poison Gas		=2	x1.0		Gas	1-2-3	Poison	1-2-3	2-4-6	x 3.0
	S	Stench	+3	=2	x0.4		Stench	1-2-3			1-2-3	x 1.2
Exotic	Emp	EMP	+1	=3	x1.0		EMP	1-2-3			1	x 4.0
Designators	F	Flash	-1	=2	x0.5		Flash	1-2-3			2	x 1.5
And Projectors	C	Freeze	+1	=3	x1.0	+1	Cold	1-2-3			2	x 3.0
	G	Grav	+5	=2	x3.0		Grav	1-2-3			3	x 20.0
	L	Laser *	+5		x1.2		Burn	1-2-3	Pen	1-2-3	2-4-6	x 6.0
	M	Mag	+4	=1	x2.0		EMP	1-2-3	Mag	1-2-3	2-4-6	x 15.0
	Psi	Psi Amp	+4	=2	x1.0		Psi	1-2-3			1-2-3	x 9.0
	R	Rad	+1	=4	x1.0	+2	Rad	1-2-3			1-2-3	x 8.0
	Sh	Shock		=2	x0.5		Elec	1-2-3-	Pain	1-2-3	2-4-6	x 2.0
	S	Sonic	+3	=2	x0.6		Sound	1-2-3	Bang	1-2-3	2-4-6	x 1.1
Launchers	aF	AF Missile	+4	=7	x4.0		Frag	2	Blast	3	5	x 3.0
	aT	AT Missile	+3	=4	x1.0	+1	Frag	2	Pen	3	5	x 2.0
	Gr	Grenade	+1	=4	x0.8		Frag	2	Blast	2	4	x 1.0
	M	Missile	+1	=6	x2.2		Frag	2	Pen	2	4	x 5.0
	RAM	RAM Grenade	+2	=6	x1.0		Frag	2	Blast	2	4	x 3.0
	R	Rocket	-1	=5	x3.0		Frag	2	Pen	2	4	x 1.0

= (the Range shown replaces the range for the weapon Type).
+ / - shows an increase or decrease to the base value of the weapon type.
1-2-3. The weapon has three power levels selectable by the user.
x shows a multiplication of the base value for the weapon.

*Laser cannot be used in Projector.
** Machine cannot be used with Revolver.

Weapon Details

Weapons are further described by burden (size or bulk), stage (technological sophistication), user (human or other), and portability.

Weapons 5

WEAPONS BURDEN AND STAGE

	Code	Descriptor	TL	Range	Mass	qreBs	Misc	D	Comment	Cr
Burden		(blank)	0	0	x1.0	0		0		x 1.0
	aD	Anti-Designator	3	1	x3.0	+3		1	Not Pistols. Shotguns.	x 3.0
	B	Body	2	*1	x0.5	-4		-1	Only Pistols.	x 3.0
	D	Disposable	3	0	x0.9	-1	Q= -2	0		x 0.5
	H	Heavy	0	1	x1.3	+3		1		x 2.0
	Lt	Light	0	-1	x0.7	-1		-1		x 1.1
	M	Magnum	1	1	x1.1	+1		1	Only Pistols.	x 1.1
	M	Medium	0	0	x1.0	0		0	Not Pistols.	x 1.0
	R	Recoilless	1	-1	x1.2	0		1		x 3.0
	Sn	Snub	1	* 2	x0.7	-3		1		x 1.5
	Vh	Vheavy	0	* 5	x4.0	+4		5		x 5.0
	Vl	Vlight	1	-2	x0.6	-2		-1		x 2.0
	Vrf	VRF	2	0	x14.0	+5		1	Only Guns and Mgs	x 9.0

	Code	Descriptor	TL	Range	Mass	qreBs	Misc	D	Comment	Cr
Stage		(blank)	0	0	x1.0	0		0		x 1.0
	A	Advanced	3	0	x0.8	-2		2		x 2.0
	Alt	Alternate	1	1	x1.1	0		2		x 1.1
	B	Basic	0	0	x1.3	0		0		x 0.7
	E	Early	-1	-1	x1.7	+1		0	EOU - 2	x 1.2
	X	Experimental	-2	-1	x2.0	+3	R=- 2	0		x 4.0
	Im	Improved	1	0	x1.0	0	R=+2	1	EOU + 2	x 1.1
	Mod	Modified	2	0	x0.9	0		1		x 1.2
	Pr	Precision	6	3	x4.0	+2		0	Only Designators.	x 5.0
	P	Prototype	-1	-1	x1.9	+2		0		x 3.0
	R	Remote	1	0	x1.0	0		0	Not Pistols.	x 7.0
	Sn	Sniper	1	1	x1.1	+1	Q= +2	0	Only Rifles.	X 2.0
	St	Standard	1	0	x1.0	0		1		x 1.0
	T	Target	0	0	x1.1	+1	Q= +2	0	Only Rifles and Pistols.	x 1.5
	Ul	Ultimate	4	0	x0.7	-2	R= +2	2		x 1.4

	Code	Descriptor	TL	Range	Mass	qreBs	qrEbs	Comment
Users		(blank)	0	0	x1.0	0	0	
	M	Man	0	0	x1.0	0	0	
	V	Vargr	0	0	x1.0	0	-1	
	A	Aslan	0	0	x1.0	0	-2	
	K	K'kree	0	0	x1.3	+2	0	
	<S>	Sophont	(insert appropriate information)					
	H	Grasper	0		x1.0	0	-1	Includes Hivers.
	P	Paw	0		x1.0	0	-1	Includes Aslan.
	G	Gripper	0		x1.0	0	-2	
	T	Tentacle	0		x1.0	0	-2	Includes Vegans.
	S	Socket	0		x1.0	0	-2	
	U	Universal	0		x1.1	+1	-1	Usable by ANY manipulator.

	Code	Descriptor	TL	Range	Mass	qreBs
Portability		(blank)	0	0	x1.0	0
	C	Crewed	0	0	x1.0	+1
	F	Fixed	0	+1	x1.0	+4
	P	Portable	0	1	x1.0	-2
	V	Vehicle Mount	0	+1	x1.0	0
	T	Turret	1	0	x1.0	0

Calculate Portability

Min Mass	Max Mass		Portability
	20		(blank)
Hi Recoil and < 40		P	Portable
20	200	C	Crewed *
200	500	T	Turret
500	1000	V	Vehicle Mount
1,000	100,000	F	Fixed
			* or Semi-Portable

Weapon Special Effects

Specific weapons have distinct capabilities or effects depending on the weapon type, descriptor, and other elements.

SPECIAL EFFECTS

Burden	Recoil	Loud	Flash	Heat	Vacc	UW	CQ
Recoilless	No	-	-	-	-	-	No
Snub	Yes	-	-	-	-	Range=1	Yes
Vheavy	Hi	-	-	-	-	-	-
VRF	Hi	-	-	-	-	No	No

Descriptor	Recoil	Loud	Flash	Heat	Vacc	UW	CQ
Accelerator	No	-	-	-	-	No	-
Acid	No	-	-	-	-	Range=0	-
AF Missile	No	Loud	Bright	Hot	-	No	No
AT Missile	No	Loud	Bright	Hot	-	No	No
AT Rocket	No	Loud	Bright	Hot	-	No	No
Dart	No	-	-	-	-	Range=1	-
EMP	No	-	-	-	-	-	-
Fire	No	-	Bright	Hot	-	No	-
Flash	No	-	Bright	-	-	Range=3	-
Freeze	No	-	-	-	-	Range=0	-
Fusion	Hi	-	Bright	Hot	-	Range=2	-
Gas	No	-	-	-	No	No	-
Gauss	Yes	-	Mag	-	-	No	-
Grav	No	-	-	-	-	-	-
Grenade	Yes	-	-	-	-	Range=1	-
Laser	No	-	Bright	-	-	Range=2	-
Mag	No	-	Mag	-	-	-	-
Missile	No	-	Bright	Hot	-	No	-
Plasma	Hi	-	Bright	Hot	-	Range=2	-
Poison Dart	No	-	-	-	-	Range=1	-
Poison Gas	No	-	-	-	No	No	-
Psi Amp	No	-	-	-	-	-	-
Rad	No	-	-	-	-	Range=1	-
RAM Grenade	No	Loud	Bright	Hot	-	Range=1	-
Rocket	No	-	Bright	Hot	-	No	-
Shock	No	-	Bright	Hot	-	Range=0	-
Sonic	No	Loud	-	-	No	Range=1	-
Splat	Yes	-	-	-	-	No	-
Spray	No	-	-	-	No	No	-
Stench	No	-	-	-	No	No	-
Tranq	No	-	-	-	No	No	-

Type	Recoil	Loud	Flash	Heat	Vacc	UW	CQ
AutoCannon	Hi	Vloud	-	-	-	No	No
Cannon	Hi	Vloud	-	-	-	No	No
Carbine	Yes	Loud*	-	-	-	No	- 1
Designator	Yes	-	-	-	-	-	- 3
Gatling	Hi	Vloud	-	-	-	No	No
Gun	Hi	Vloud	-	-	-	No	- 3
Launcher	No	-	-	-	-	-	- 3
Machinegun	Yes	Loud	-	-	-	No	- 3
Multi-Launcher	No	-	-	-	-	No	- 3
Pistol	Yes	Loud*	-	-	-	No	+2
Projector	No	-	-	-	-	-	-
Revolver	Yes	Loud*	-	-	-	No	+2
Rifle	Yes	Loud*	-	-	-	No	- 5
Shotgun	Yes	Loud	-	-	-	-	- 3

* But Not Laser.

If the tables give multiple effects, select the worst effect.

The Hierarchy of Special Effects

Special effects are unusual positive or negative consequences of the weapon design.

Recoil

Recoil disorients a user in Zero-G situations. Hi-recoil disorients.

Yes = weapon has recoil.

Hi = weapon has high recoil.

No = weapon has no recoil and is preferred in Zero-G situations.

Loud

Some weapons make a loud noise when operated (all weapons are Silent in Vacuum).

Loud = Bang-1. Weapon can be silenced (by attachment of a separate Silencer).

Vloud = Bang-2. Weapon cannot be silenced.

No entry = The weapon is silent.

Flash

Some weapons emit a flash when operated.

Bright = Flash-1. Weapon flash is Bright (across all vision bands).

Mag = Mag-1. Weapon flash is Mag.

No entry = Weapon has no flash.

Heat

Some weapons get hot in operation.

Hot = weapon emits heat.

No entry = weapon emits no heat.

Vacc

Some weapons don't work in Vacuum.

No = weapon unusable in Vacuum.

No entry = Vacuum has no effect.

UW (UnderWater)

Some weapons don't work underwater.

No = cannot be used Underwater.

Range=N is the maximum range the weapon may be used underwater.

CQ (Close Quarters)

Some weapons cannot be used in close quarters (typically inside buildings and starships).

No = unusable in Close Quarters.

Yes = preferred in Close Quarters.

N (any Number) = EOU Mod for this weapon in Close Quarters.

Weapon Options

Weapons can be enhanced or varied by the addition of options by the user, or at the factory.

INSTALLABLE WEAPONS OPTIONS

Code	Option Item	Effect	QREBS
a	Low Signature- Visual. Camouflaged	Mod -2 for Visual Detection.	-1 S
b	Low Signature Metal. Plastic Construction.	Mod -4 for Metal Detection.	-1 S
c	Quiet. Silenced.	Converts Loud to Quiet.	-1 E
d	Folding Stock. Collapsing Stock. Close Quarters.	Mod +2 for EOU in Close Quarters.	-2 R
e	Stable Platform. Gyroscopic. Shoulder Stock for Pistols.	Mod +2 to Hit.	-1 E
f	Flash Suppressor Visual.	Mod -4 Visual Detection in Darkness.	-1 B
g	Hot Environment Adapted. Insulated.	Mod +3 Reliability in Hot Environment.	-3 E
h	Corrosive Environment Adapted. Anti-Corrosion Coating.	Mod +3 Reliability in Corrosive Environment.	-3 E
i	Cold Environment Adapted. Insulated.	Mod +3 Reliability in Cold Environment.	-3 E
j	Amplification or Magnification Sights.	Increase Maximum Range +1.	-2 E
k			
l			
m			
n			
o	Locked to Key.	Usable only if in possession of Key..	-2 R
p	Locked To User.	Usable only by Current Identified User.	-2 R
q			
r-	Sight Input is [ ]	V- Vision H-Sound	
s-	Sight Display Output is [ ]	S-Smell T-Touch	
t-		A-Awareness P-Perception	
w			
x	Sensor Acquisition and Tracking of Target.	Specify Sensor. Used with Type: Guns only.	
y			
z			

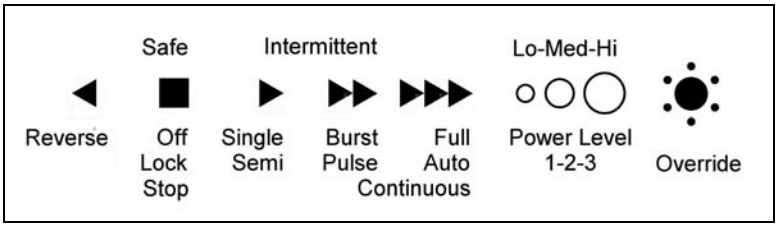
For example, t(NFX) x(RGB) n is a sight mechanism that sees in IR and outputs on a screen or display in visual light. It includes a magnification element.

Selection of an Option requires applying the QREBS Mod shown as well.

Weapon Controls

-The capabilities of weapons are reflected in their controls. These charts determine the controls to be expected on weapons.

WEAPON CONTROL MARKINGS



Type	Off	Single	Burst	Full	P1-P2-P3	Override
Gun	Off	Single	-	-	-	Override
Gatling	Off	-	Burst	Full	-	Override
Cannon	Off	Single	-	-	-	Override
Autocannon	Off	-	Burst	Full	-	Override
Rifle or Carbine	Off	Single	-	-	-	-
Pistol or Revolver	Off	Single	-	-	-	-
Shotgun	Off	Single	-	-	-	-
Machinegun	Off	-	Burst	Full	-	-
Launcher	Off	Single	-	-	-	Override
MultiLauncher	Off	Single	Burst	-	-	Override
Designator	Off	-	-	Full	P1-P2-P3	Override
Projector	Off	Single	-	-	-	Override

Descriptor	Off	Single	Burst	Full	P1-P2-P3	Override
Accelerator	Off	-	Burst	-	P1-P2-P3	-
Acid	Off	-	-	-	-	-
AF or AT Missile	Off	-	-	-	-	-
Anti-Flyer	Off	-	Burst	Full	-	-
Anti-Tank	Off	-	-	-	-	-
Assault	Off	-	Burst	-	-	-
Battle	Off	-	-	-	-	-
Combat	Off	-	-	Full	-	-
Dart	Off	Single	-	-	P1-P2-P3	-
EMP	Off	-	-	-	P1-P2-P3	-
Fire	Off	-	-	-	P1-P2-P3	-
Flash	Off	-	-	-	P1-P2-P3	-
Freeze	Off	-	-	-	P1-P2-P3	-
Fusion	Off	-	-	-	-	-
Gauss	Off	-	Burst	-	-	-
Grav	Off	-	-	-	P1-P2-P3	-
Grenade	Off	Single	-	-	-	-
Hunting	Off	-	-	-	-	-
Laser	Off	-	Burst	-	P1-P2-P3	-
Mag	Off	-	-	-	P1-P2-P3	-
Missile	Off	Single	-	-	-	-
Plasma	Off	-	-	-	-	-
Poison Gas	Off	-	-	-	P1-P2-P3	-
Psi Amp	Off	-	-	-	P1-P2-P3	-
Rad	Off	-	-	-	P1-P2-P3	-
RAM Grenade	Off	-	-	-	-	-
Rocket	Off	-	-	-	-	-
Shock	Off	Single	-	**	P1-P2-P3	-
Sonic	Off	Single	-	**	P1-P2-P3	-
Splat	Off	-	-	-	-	-
Stench	Off	-	-	-	P1-P2-P3	-
Sub	Off	Single	Burst	Full	-	-
Survival	Off	-	-	-	-	-

** Called Continuous.

WEAPON CONTROL OPERATION

The following weapon controls are available.

Off. The weapon is inactive. This control is a safety. Manipulating it again turns the weapon on. A mishap is impossible if this control is Off.

Single. The weapon fires one shot per pull of the trigger.

Burst. The weapon fires three shots per pull of the trigger.

Full. The weapon fires shots until the trigger is released. For some weapons marked **, manufacturers call this “continuous” instead.

P1-P2-P3. The weapon has three settings for power level. The standard level is P1 and corresponds to 1D damage in each of the possible damage types for the weapon.

Power Level P2 corresponds to 2D damage; the user must roll Quality or less to avoid weapon malfunction.

Power Level P3 corresponds to 3D damage; the user must roll Quality or less TWICE to avoid weapon malfunction.

Override. The weapon has a battlefield override. If the weapon malfunctions, this control will force it to function, although damage may result.

Determining Controls

The Controls for a Weapon are the sum of the controls for Type and Descriptor.

For example, a Rifle has Off-Single.

Adding Assault to Rifle adds Burst to become Off-Single-Burst.

Adding Laser to Rifle adds P1-P2-P3 to become Off-Single-Burst-P1-P2-P3.

GunMaker

Most personal and military weapons can be created using this chart.

Weapons 9

Roll (or Pick)
Type, then
SubType-Descriptor-Burden-Stage
Add User
Calculate details,
Add Portability.

Weapon TL=
Sum of TL Mods shown.

		STAGE		BURDEN	
2D	0	Precision*	**6**		
	1	Remote*	**1**	Recoilless*	**1**
	2	Experimental	**-2**	VRF*	**0**
	3	Protoype	**-1**	Anti-Designator*	**3**
	4	Early	**-1**	Disposable	**3**
	5	Basic	**0**	Heavy	**0**
	6	<blank>	**0**	Light	**0**
	7	Standard	**1**	<blank>	**0**
	8	Modified	**2**	Medium*	**0**
	9	Improved	**1**	Snub	**1**
	10	Advanced	**3**	Vheavy	0
	11	Alternate	**1**	Vlight	1
	12	Obsolete	**4**	Body*	2
	13	Sniper*	**1**	Magnu1m*	**1**
	14	Target*	**0**		

		USER	
2D	2	<S1>	Socket
	3	Droyne	
	4	Vegan	Tentacle
	5	Vargr	Universal
	6	<blank>	
	7	Man	Hand
	8	<blank>	
	9	Aslan	Paw
	10	Hiver	Grasper
	11	K'kree	Gripper
	12	<S2>	

		DESCRIPTOR		SUBTYPE		TYPE
1D	1	Anti-Flyer	4	Gun	6	**1** Guns
	2	Anti-Tank	0	Gun	6	
	3	Assault	2	Gatling	7	
	4	Fusion	8	Cannon	6	
	5	Gauss	7	Cannon	6	
	6	Plasma	6	AutoCannon	8	
2D	2	<blank>	0	Carbine	5	**2** Rifles
	3	Accelerator	4	Carbine	5	
	4	Assault	2	Carbine	5	
	5	Battle	1	Rifle	5	
	6	Combat	2	Rifle	5	
	7	(Poison) Dart	1	Rifle	5	
	8	Gauss	7	Rifle	5	
	9	Hunting	0	Rifle	5	
	10	Laser	5	Carbine	5	
	11	Splat	2	Carbine	5	
	12	Survival	0	Carbine	5	
1D	1	<blank>	0	Revolver	4	**3** Pistols
	2	Accelerator	4	Pistol	5	
	3	Laser	5	Pistol	5	
	4	<blank>	0	Pistol	5	
	5	<blank>	0	Pistol	5	
	6	<blank>	5	Revolver	4	
1D	1	<blank>	0	Shotgun	4	**4** Shotguns
	2	Assault	2			
	3	Hunting	0			
	4	Hunting	0			
	5	Assault	2			
	6	<blank>	0			
1D	1	<blank>	0	Machinegun	4	**5** Machineguns
	2	Anti-Flyer	4			
	3	Assault	2			
	4	Sub	-1			
	5	Sub	-1			
	6	<blank>	0			
1D	1	AT Missile	4	Launcher	6	**6** Launchers
	2	AF Missile	3	Launcher	6	
	3	Grenade	1	Launcher	6	
	4	RAM Grenade	1	Multi-Launcher	8	
	5	Missile	2	Multi-Launcher	8	
	6	Rocket	-1	Multi-Launcher	8	
2D	2	Poison Gas	0	Projector	7	**0** Projectors
	3	EMP or Rad	1			
	4	Fire	3			
	5	Flash	1			
	6	Freeze	1			
	7	Grav or Laser	5			
	8	Mag	4			
	9	Psi Amp	4	Designator	9	**7** Designators
	10	Acid or Shock	0			
	11	Sonic	3			
	12	Stench	3			

Weapon Design

As the weapon is designed insert the design values and details into this Fillform. Values may be inserted in any order as the design is considered: the ultimate requirement is that the values balance and properly reflect the charts and tables.

Weapons 2

BUILDING WEAPONS

This Fillform allows an interactive design process which ultimately produces a final weapon design.

Tech Level. Tech Level for a weapon is the minimum level required for manufacture.

WEAPONS MANUFACTURER

Manufacturer			
Surface or Orbital Factory?	TL	LL	

WEAPONS

Chart	Item	Description	Model	TL	Range	Mass	Burden	H1 H2	D1 D2	H3	D3	KCr 000,	Cr ,000
		Q R E B S											
3	Type	Gun	G	6	~~4~~	9	-1	*	2			5	
3	SubType												
4	Descriptor	Plasma	P	5	4	x2.5		Pen	3	Burn	3	x2	
5	Burden												
5	Stage												
6	Notes	Recoil= Hi Loud= Vloud											
		Flash= Bright Heat= Hot											
		Vacc= UW= No											
		CQ= -3											
7	Options												
		Q R E B S											
5	User	Man											
8	Controls	Off-Single-Override											
5	Portability	Portable			+1		+2						
	Totals			11	5	22	-1	Pen	5	Burn	3	10,000	

WEAPON DESCRIPTION

Model	LongName (Stage-Burden-Descriptor-Type-User-Portability-TL)
PGMP-11	Plasma Gun Man Portable- 11

The basic information required to describe a weapon.

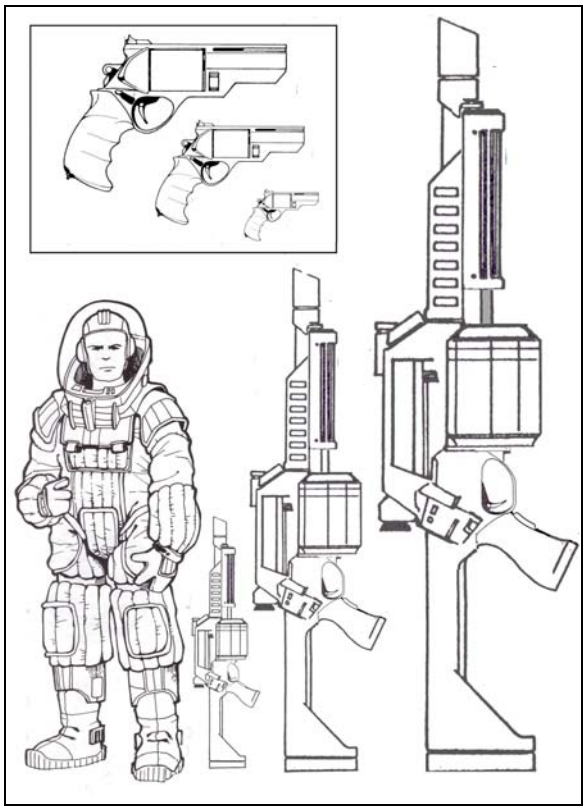
Wx: WEAPON EXTENSION

	Range	Cost	Mass	QREBS	Effects	
Wx:	R=5	Cr10,000	22.5 kg	B= -3	Pen-5	Burn-3

The basic information required to use a weapon.

BIG WEAPONS

The majority of weapons are manufactured as Standard, and the weapon creation system produces Standard size weapons. Appropriate automated and CNC manufacturing systems allow the production of upsized weapons for Oversize and Titan Sophonts, Robots, and Armor. Upsized weapons can be produced for all Categories except Guns.



Left to Right: Std MRAMmL-10, OS MRAMmL-11, Titan MRAMmL-12
Inset Top to Bottom: Std MRe-5, OS MRe-6. Titan MRe-7.

OVERSIZED WEAPONS

Oversize Weapons are pantographed to double Standard Size (dimensions x2; weight x 8).

TL=	+1
R=	+1 (max= 6)
Cr=	x2
Dimensions	x2
Kg=	x8
Effects=	x2
Q=	- 2
R=	- 2
E=	unchanged
B=	unchanged
S=	unchanged

TITAN WEAPONS

Titan Weapons are likewise pantographed to triple Standard Size (dimensions x3, weight x27).

TL=	+2
R=	+1 (max= 6)
Cr=	x3
Dimensions	x3
Kg=	x27
Effects=	x3
Q=	- 3
R=	- 3
E=	unchanged
B=	unchanged
S=	unchanged

Three Versions of the MRAMmL-10

Std	MRAMmL-10	Medium RAM Grenade Multi-Launcher -10	R=6	Cr27000	10 kg	Blast -2 Frag -3
OS	MRAMmL-11	Medium RAM Grenade Multi-Launcher -11	R=6	Cr54000	80 kg	Blast -4 Frag -6
Titan	MRAMmL-12	Medium RAM Grenade Multi-Launcher -12	R=6	Cr81000	270 kg	Blast -6 Frag -9

USERS

Small users (Size =50 or so) are unable to handle most Standard weapons. They can use Category Pistols and Projectors and Designators under 2 kg. Small assumes the individual is less than 1 meter tall and less than 50 kg mass. C1 C2 C3 are probably created with 1D each.

Standard users (Size= 100 or so) can use most weapons depending on their personal characteristics. Standard assumes the individual is approximately 1.5 to 2 meters tall and less than 100 kg mass. C1 C2 C3 are probably created with 2D each.

Oversize users (Size = 200 or so) cannot use Standard Category Pistols. They can use most other weapons depending on their personal characteristics. Oversize assumes the individual is approximately 3 to 4 meters tall (possibly altered by a multi-legged horizontal stance) and masses 400 to 800 kg. C1 C2 C3 are probably created with 3D each.

Titan users (Size = 300 or so) cannot use Standard weapons; they must use Titan weapons. Titan assumes the individual is approximately 4 to 5 meters tall (possibly altered by a multi-legged horizontal stance) and masses 1 to 2 tons. C1 C2 C3 are probably created with 4D or 5D each.

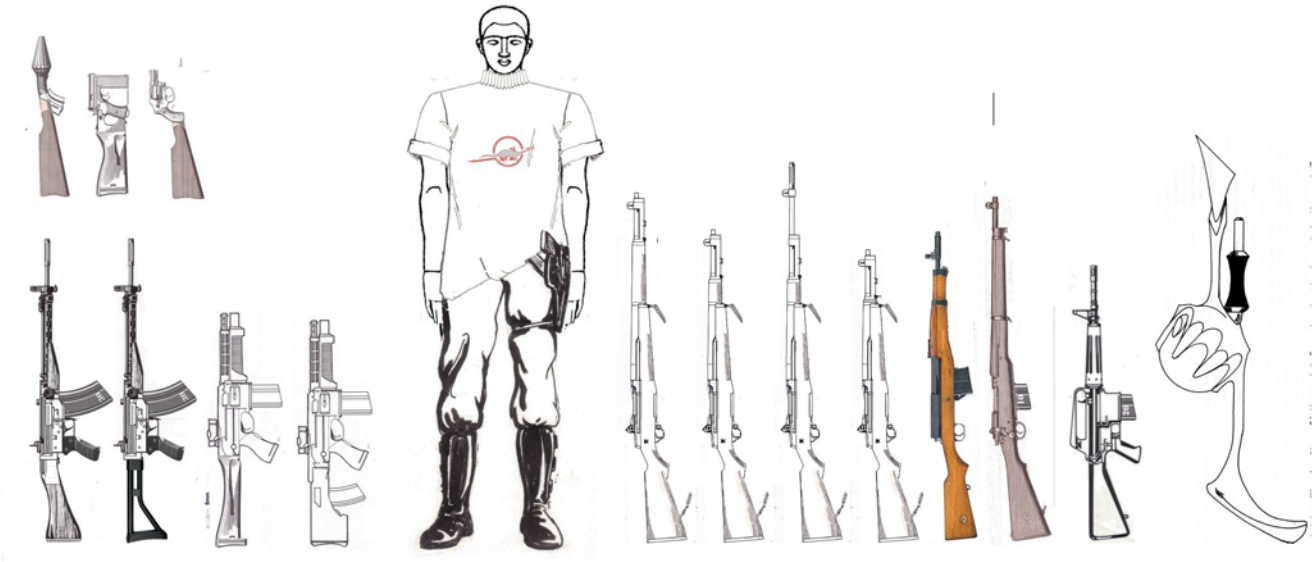
Armor and Robots. Armor for sophonts and Humaniform or Sophontiform robots are produced in Standard (same size as the Sophont), Oversize (double size), and Titan (triple size).

For example, an Oversize Humaniform Robot is twice the size (height) of a human. A Titan Battledress for a human is triple the size (height) of a human.

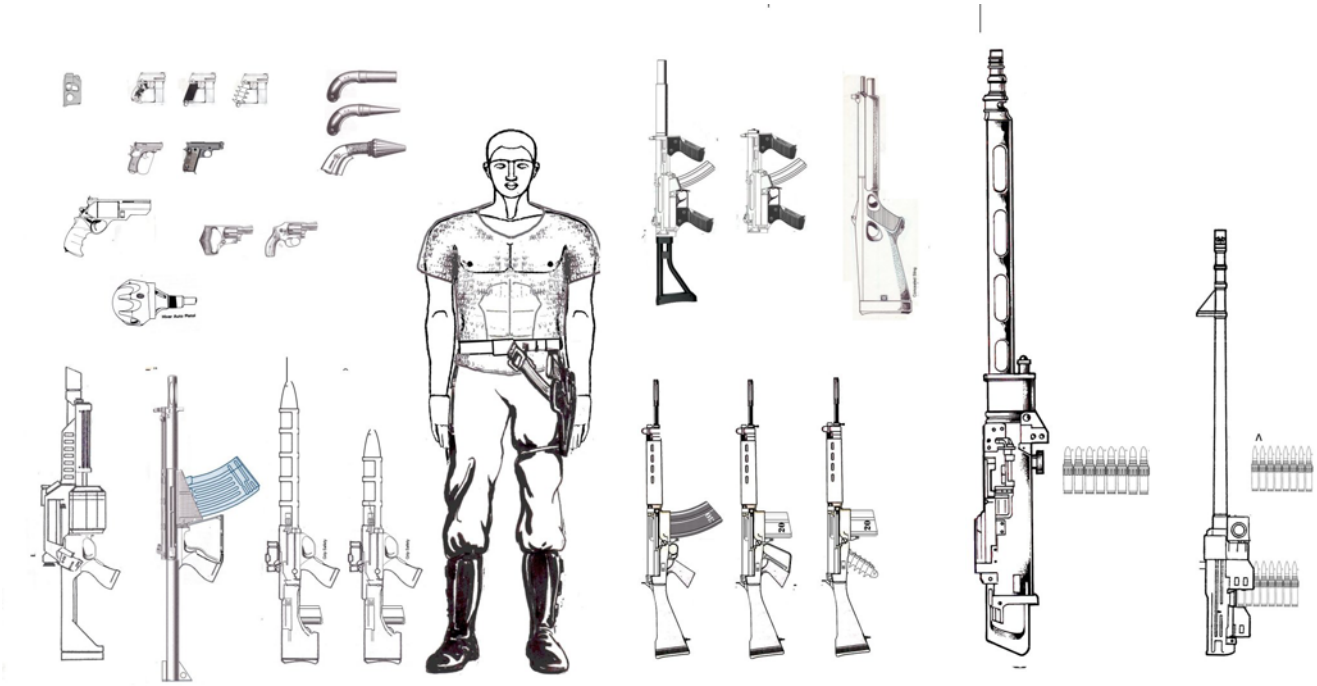
The Gun Catalog

The following weapon examples demonstrate the output of the weapons generation system.

Armor 12



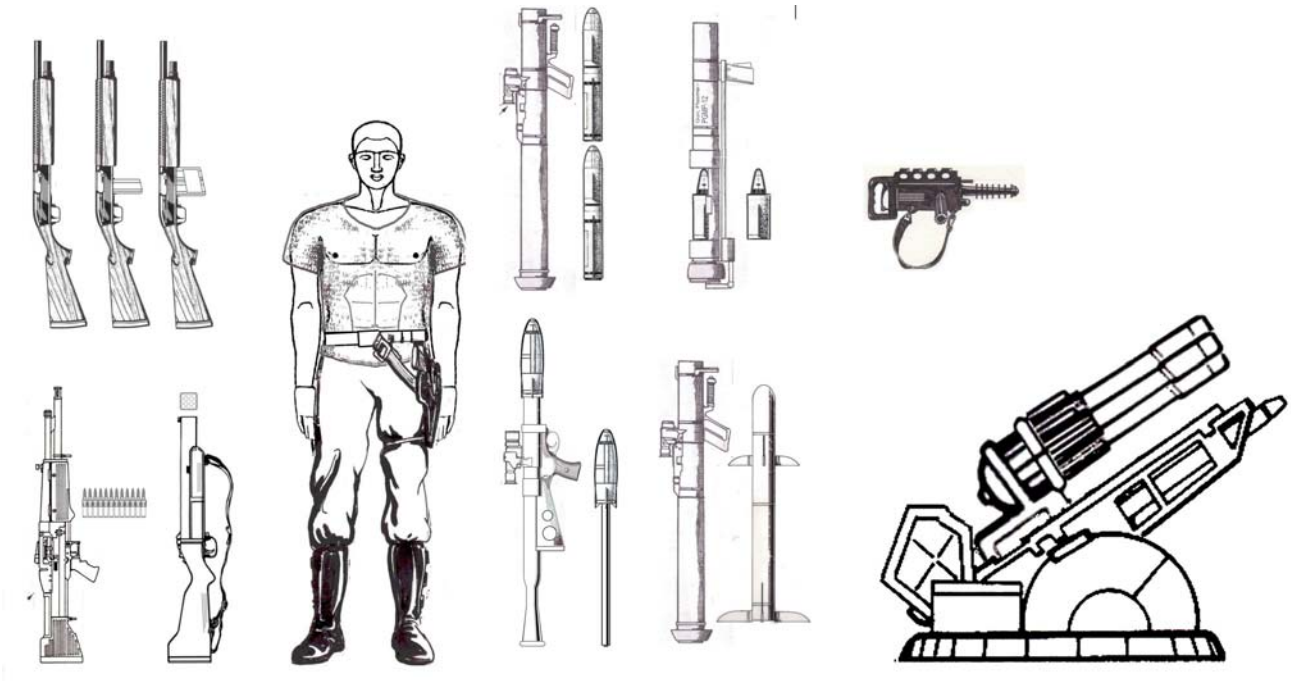
BR-6 Battle Rifle -6 R=5 Cr400 4 kg Bullet -3
ACR-10 Advanced Combat Rifle -10 R=3 Cr1300 2.8 kg Frag -4 Bullet -2
BR-5 Basic Rifle -5 R=5 Cr350 5.2 kg Bullet -2
SnR-6 Snub Rifle -6 R=2 Cr2500 2.8 kg Bullet -3
ScR-6 Sniper Rifle -6 R=6 Cr1000 4.4 kg Bullet -2
ER-4 Early Rifle -4 R=4 Cr600 6.8 kg Bullet -2
EBR-5 Early Battle Rifle -5 R=4 Cr480 6.8 kg Bullet -3
AltLtCRH-8 Alternate Light Combat Rifle Hiver -8 R=3 Cr1072.5 2.7 kg Frag -3 Bullet -2



GmL-9 Grenade Multi-Launcher -9 R=4 Cr3000 8 kg Blast -2 Frag -3
RCR-8 Recoilless Combat Rifle -8 R=2 Cr975 4.3 kg Frag -3 Bullet -2
GR-12 Gauss Rifle -12 R=5 Cr1500 3.6 kg Bullet -4
GC-12 Gauss Carbine -12 R=3 Cr1200 2.7 kg Bullet -3
CR-7 Combat Rifle -7 R=3 Cr650 3.6 kg Frag -2 Bullet -2
CR-7 Combat Rifle -7 R=3 Cr650 3.6 kg Frag -2 Bullet -2
CR-7 Combat Rifle -7 R=3 Cr650 3.6 kg Frag -2 Bullet -2
SMg-5 Sub Machinegun -5 R=2 Cr2700 2.4 kg Bullet -3

HAGaC-9 Heavy Assault Gatling Crewed -9 R=5 Cr13200 41 kg Bang -1 Blast -3 Pen-3
BHMg-6 Basic Heavy Machinegun -6 R=6 Cr2310 13 kg Bullet -5

AltLtR-6 Alternate Light Rifle -6 R=5 Cr825 3 kg Bullet -3

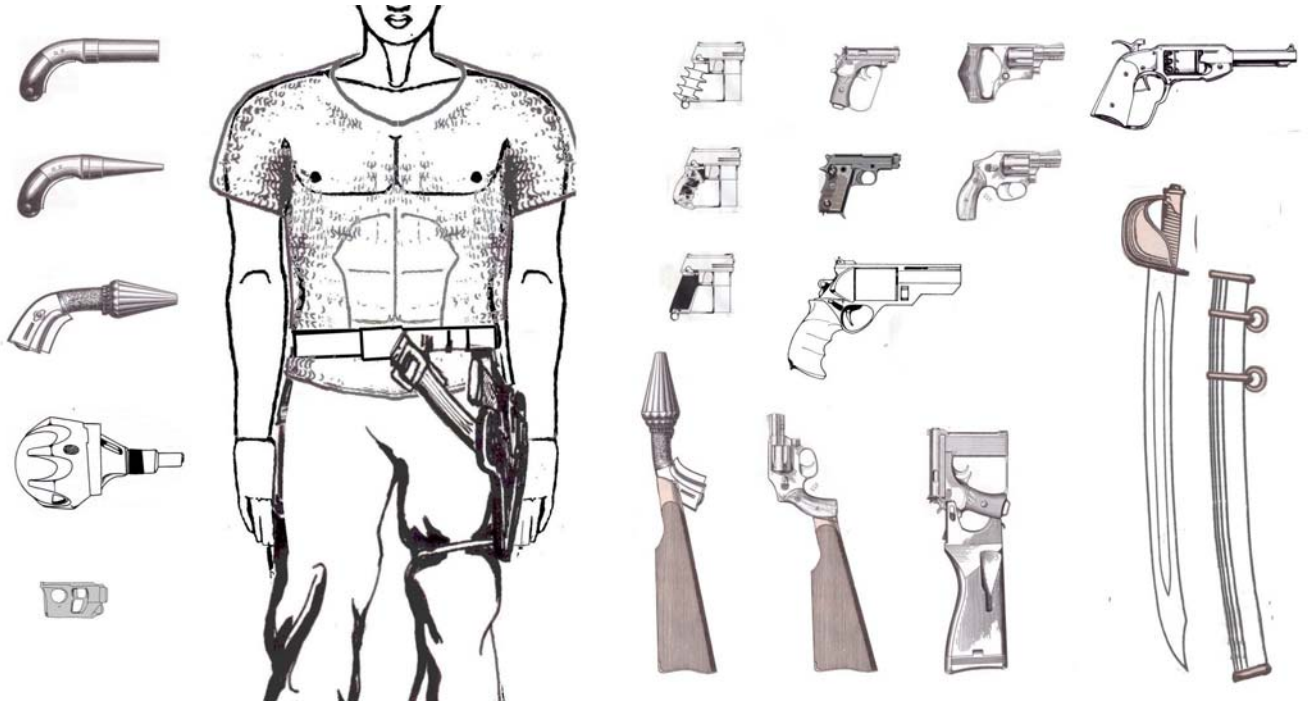


HS-4 Hunting Shotgun -4 R=3 Cr360 3.6 kg Bullet -1 Frag -2
AS-6 Assault Shotgun -6 R=4 Cr450 3.2 kg Bang -1 Blast -2 Frag -2
ImAS-7 Improved Assault Shotgun -7 R=4 Cr495 3.2 kg Bang -1 Blast -3 Frag -2
SpC-7 Splat Carbine -7 R=4 Cr960 3.9 kg Bullet -2
LtMg-6 Light Machinegun -6 R=4 Cr4500 5.6 kg Bullet -3

aTmL-11 AT Missile Multi-Launcher -11 R=4 Cr6000 10 kg Pen-3 Frag -3
LtRL-5 Light Rocket Launcher -5 R=4 Cr1500 16 kg Pen-2 Frag -2

XRPLC-12 Experimental Recoilless Plasma Launcher Crewed -12 R=1 Cr12000 48 kg Burn -3 Pen-5

ImVrfGaV-10 Improved VRF Gatling Tank Mount -10 R=5 Cr79200 560 kg Pen-5



EmpPj-10 EMP Projector -10 R=3 Cr1200 1 kg EMP -2
FPj-10 Freeze Projector -10 R=3 Cr900 1 kg Cold -3
FPj-8 Fire Projector -8 R=2 Cr600 0.9 kg Pen-1 Burn -2
EmpPj-10 EMP Projector -10 R=3 Cr1200 1 kg EMP -2
FPj-10 Flash Projector -10 R=2 Cr450 0.5 kg Flash -3
MPj-11 Mag Projector -11 R=1 Cr4500 2 kg EMP -1 Magnetic -4
PPj-9 Poison Gas Projector -9 R=4 Cr900 1 kg Poison -2 Gas -2
FPj-10 Freeze Projector -10 R=3 Cr900 1 kg Cold -3
FPj-10 Flash Projector -10 R=2 Cr450 0.5 kg Flash -3
RPj-10 Rad Projector -10 R=4 Cr2400 1 kg Rad -2
PPj-9 Poison Gas Projector -9 R=4 Cr900 1 kg Poison -2 Gas -2
ShPj-9 Shock Projector -9 R=2 Cr600 0.5 kg Pain -2 Elec -2

MRe-5 Magnum Revolver -5 R=3 Cr100 1.3 kg Bullet -2

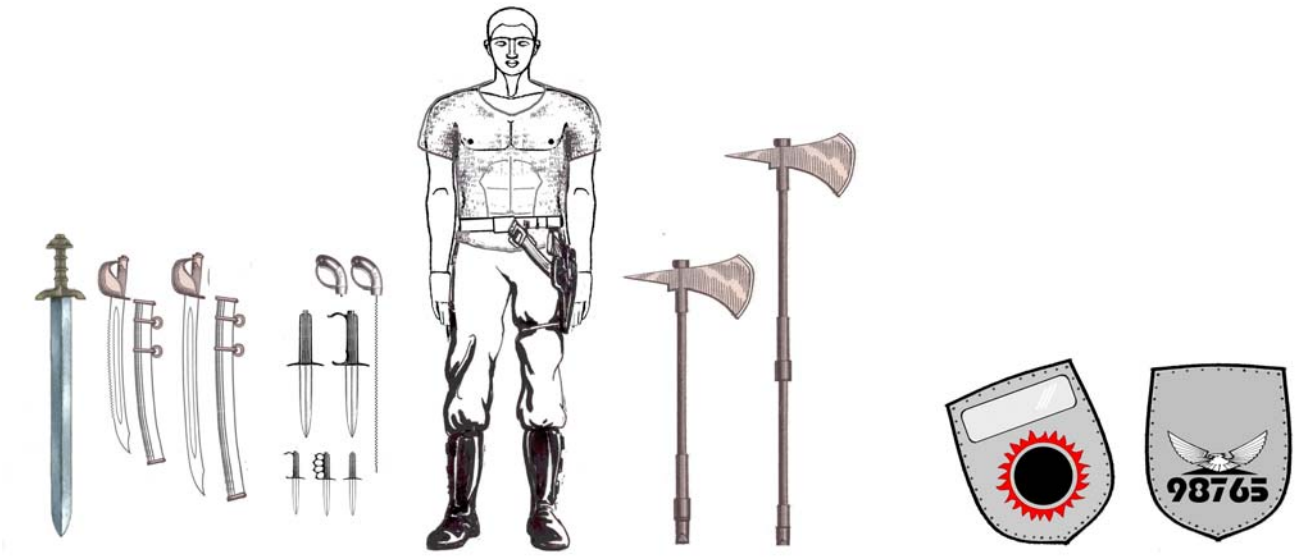
ASnRe-8 Advanced Snub Revolver -8 R=2 Cr1000 0.7 kg Bullet -4
ASnP-9 Advanced Snub Pistol -9 R=2 Cr1500 0.6 kg Bullet -4

EHGrPj-11 Early Heavy Grav Projector -11 R=1 Cr7920 6.6 kg Grav -5

BLADE CATEGORIES AND TYPES

Category	Code	Descriptor	TL	Range	Mass	qreBs	H1	D1	H2	D2	Hits (v1)	Cr
Short Blades	K	Knife	1	R	0.5		Cuts	2			2D	50
	D	Dagger	2	R	0.5		Cuts	2			2D	50
	TK	Trench Knife	4	R	1		Cuts	2	Blow	1	2D	100
	BK	Big Knife	5	T	3		Cuts	2	Pen	=C1	2D	200
	GBK	Great Big Knife	6	1	6		Cuts	2	Pen	=C1	2D	900
Medium Blades	S	Sword	3	1	2		Cuts	2			2D	300
	sS	Short Sword	3	1	1	B= - 1	Cuts	2			2D	300
	bS	Broadsword	4	1	3		Cuts	3			3D	700
	C	Cutlass	3	1			Cuts	2			2D	200
	OC	Officers Cutlass	5	1			Cuts	2			2D	400
Long Blades	P	Spear. Pike	1	1		B= +3	Cuts	2			2D	50
Special Blades	Ax	Axe	2	T			Cuts	3			3D	60
	A	Space Axe	9	1			Cuts	2	Pen	=C1	2D	500
	V	Vibro-Blade	10	1			Cuts	2			2D	900
		Mace	2	1			Cuts	1	Blow	=C1	2D	100
		Club	1	1					Blow	=C1	1D	10

Category	Code	Descriptor	TL	Range	Mass	qreBs	H1	D1	H2	D2	Hits (v1)	Cr
Body Weapons	Fi	Fists		R			Blow	=C1			1D	
	Te	Tentacle		0			Hit	=C1	Suff	1	1D	
	Ho	Horns		R			Pen	=C1			2D	
	Tu	Tusks		R			Pen	=C1			2D	
	Fa	Fangs		R			Pen	=C1			2D	
	T	Teeth		R			Cuts	=C1			1D	
	Cl	Claws		R			Cuts	=C1			1D	
	H	Hooves		R			Blow	=C1			2D	
	Sp	Spikes		0			Pen	=C1			2D	
	St	Sting		R			Pen	=C1	Poison	2D	3D	



Left to Right. Broadsword-4. Star Marine Officer's Cutlass-5. Star Marine Cutlass-3. Big Knife-5. Big Knife Alternate-5. Knife Alternate-1. Trench Knife-4. Knife-1. Vibro-Blade-10 (off). Vibro-Blade-10 (on; blade extended). Typical Human. Space Ax-9. Space Ax-9 Extended. Shield with Transparent Panel. Shield.

The Armory

A continuing enterprise among adventurers is seeking out new weapons to help them in their quests.

Weapons are found in a wide variety of locations: gun shops, military surplus auctions, factories, even abandoned bases and old battlefields.

ACQUIRING WEAPONS

Weapons are acquired in the course of adventures. While the simplest course of action would seem to be simply buying specific items,

Weapons Shops. The simplest and easiest source of weapons is a Weapons Shop. Regrettably, its selection is usually restricted to Pistols and Rifles.

The Armory. Each military unit maintains an armory in which its weapons are securely stored. An Armory has weapons suitable to the military unit's mission.

Caches. Weapons are occasionally stored in clandestine caches, in reserve for future use, or to avoid capture by enemy forces. Caches are fortuitously discovered or encountered by explorers.

Property Disposal Yards. Excess weapons are sent to property disposal yards for recycling. Useful weapons can sometimes be purchased as surplus.

The Factory. Weapons are often produced in quantity at local manufacturing facilities.

Mustering Out Benefits. Some characters acquire one or more weapons when they Muster Out.

TYPICAL WEAPONS AVAILABILITY

Weapons Shop	10 different Rifle 10 different Pistol 3 different Shotgun
Armory	10 identical Rifle 5 identical Pistol 2 different Guns 2 different Projectors 1 Launcher
Cache	10 identical Rifles 5 identical Pistols 2 different Remote Weapons 1 Designator 1 Launcher
Property Disposal	10 different Obsolete Weapons 5 different Prototype Weapons 2 different Experimental Weapons 5 random weapons
Factory	4 different examples of a Weapon (all are As Issued)
Network Search	3 different examples of a Weapon (all are Used)
Muster Out	1 Player-Crafted Weapon

FOR EXAMPLE

Eneri Dinsha, with his friends, are looking for some firepower for their 5-person crew.

Astrogator Aia Resteff is an ex-Marine and takes them to the Star Marine Property Disposal Yard, where she talks her way in. Browsing in the ordnance area, they find several weapons in crates. The Referee creates some weapons for them. He rolls:

Category 1D = 3. Pistols.		
Type 1D = 6 Revolvers.	Re	TL 5
Descriptor 1D = 5 (blank)		TL 0
Burden 2D = 8 Magnum	M	TL 1
Stage 2D = 8 Modified.	Mod	TL 2
	ModMRe	8

"Here's a crate of ModMRe-8's. Wow. This is the Imperial model with the dark satin finish!"

Category 1D = 2. Guns.		
Type 1D = 1 Gun.	G	TL 6
Descriptor 1D = 5 Gauss.	G	TL 7
Burden 2D = 4 Disposable.	D	TL 3
Stage 2D = 3 Prototype	P	TL -1
	PDGG	15

"Look at this! PDGG-15, Prototype Disposable Gauss Guns-15. I've never even heard of these before.

Category 1D = Projectors		
Type 1D = Projector	Pj	TL 7
Descriptor 2D = 10 Psionic Amp	Psi	TL 4
Burden 2D = 5 Heavy	H	TL 0
Stage 2D = 6 (blank)		TL 0
	HPsiPj	11

"Aren't these illegal? HPsiPj-11, Heavy Psionic Amplifier Projector-11. This makes my skin crawl. Ugh!"

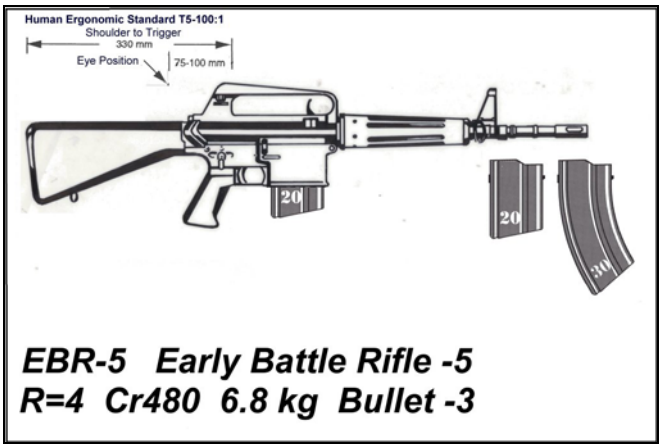
"No, look, the manual is in Zhodani. These look like battlefield captures, and then they were sent here. How far is a gdasht? About a kilometer? These babies can reach reach us in orbit! No, that can't be right. That's a gdint. OK. Now I see. They can only reach to the horizon."

Category 1D = 1 Guns.		
Type 1D = 2 Gun.	G	TL 6
Descriptor 2D = 6 Plasma	P	TL 6
Burden 2D = 7 (blank)		TL 0
Stage 2D = 6 (blank)		TL 0
	PG	12

(referee looks further, knowing that Plasma Guns need a portability code = MP).

What's in here? Plasma Gun Man Portable-12. These are still new in the crate. See if there are any BattleDress crates.

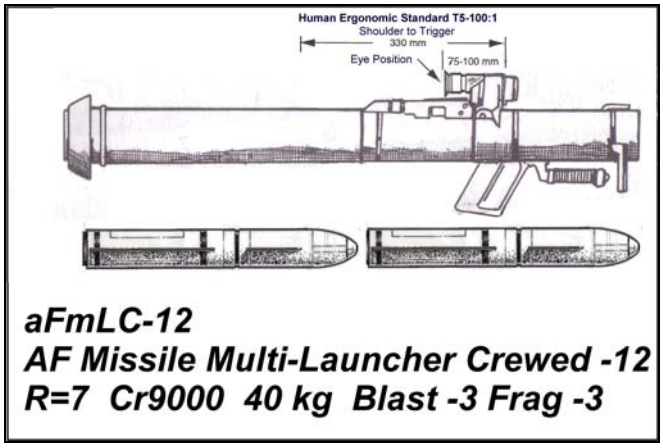
How are we going to get all of this stuff back to the ship?



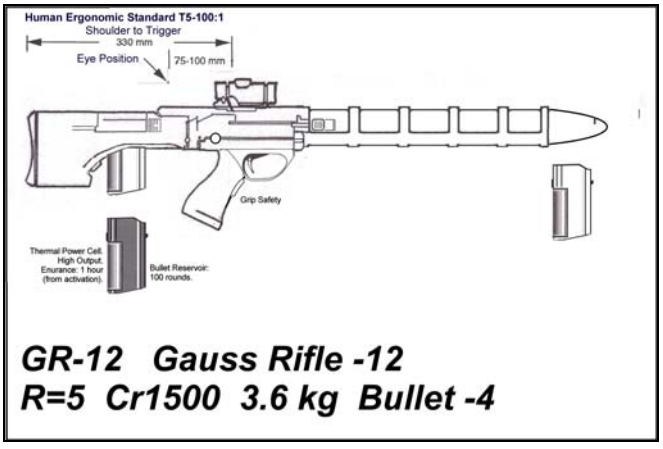
EBR-5 Early Battle Rifle -5
R=4 Cr480 6.8 kg Bullet -3

ACR-10 Advanced Combat Rifle -10
R=3 Cr1300 2.8 kg Frag -4 Bullet -2

BR-6 Battle Rifle -6
R=5 Cr400 4 kg Bullet -3

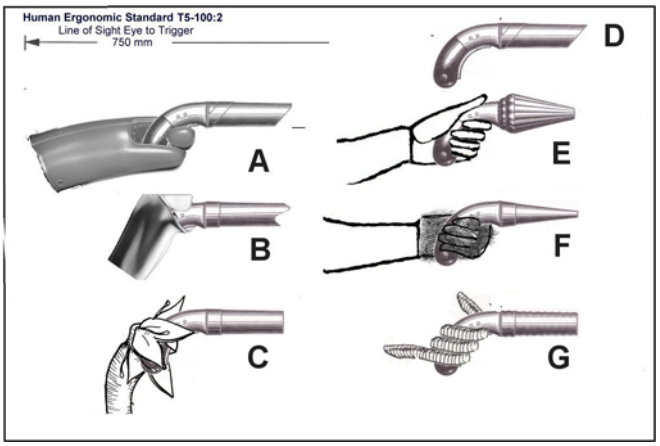


aFmLC-12
AF Missile Multi-Launcher Crewed -12
R=7 Cr9000 40 kg Blast -3 Frag -3



GR-12 Gauss Rifle -12
R=5 Cr1500 3.6 kg Bullet -4

AS-6 Assault Shotgun -6
R=4 Cr450 3.2 kg
Bang -1 Blast -2 Frag -2



An Assortment of Projacs. A. LtEmpPj-10 Light EMP Projector -10 R=2 (held by Gripper). B. LtPsiPj-13 Light Psi Amp Projector -13 R=4 (held by Socket). C. LtSPj-12 Light Stench Projector -12 R=1 (held by Hiver Grasper). D. LtPPj-9 Light Poison Gas Projector -9 R=3 (showing universal grip with grab-trigger). E. LtShPj-9 Light Shock Projector -9 R=1 (held by Hand). F. LtRPj-10 Light Rad Projector -10 R=3 (held by Paw). G. AltLtSPj-13 Alternate Light Stench Projector -13 R=2 (held by Tentacle).

Armor

Armor is the tool that characters use for personal protection against the elements, against animal violence when hunting, and against violence in pursuit of personal, corporate, and governmental goals.

Armor is a natural consequence of, and element of, any tool-using sophont society: it is used for personal protection, as defense against the elements, animals, and violence from other sophonts in situations that have escalated beyond non-violent personal interactions.

UNDERSTANDING ARMOR

Armor is protection against the effects of weapons (and against the effects of the environment).

Armor is described with a LongName which generally describes its principles or construction, and with a Model which abbreviates the LongName.

With an understanding of Weapons, Armor, Vehicles, and Combat, players can generally understand the relative value of Armor from their LongNames and Models.

Types of Protection

Various types of Armor are differentiated by the protections they provide.

Armor is a barrier to physical blows and penetration.

Cage is a barrier to EMP.

FlashProof is a barrier to bright light (usually as automatic polarization or darkening of transparents.

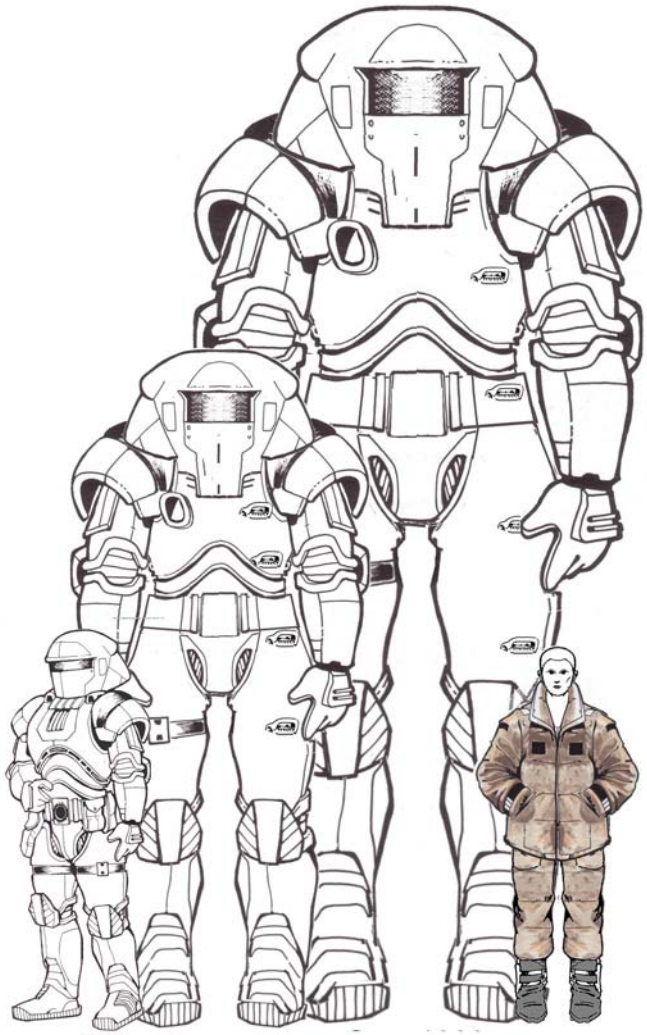
RadProof is a barrier to radioactivity.

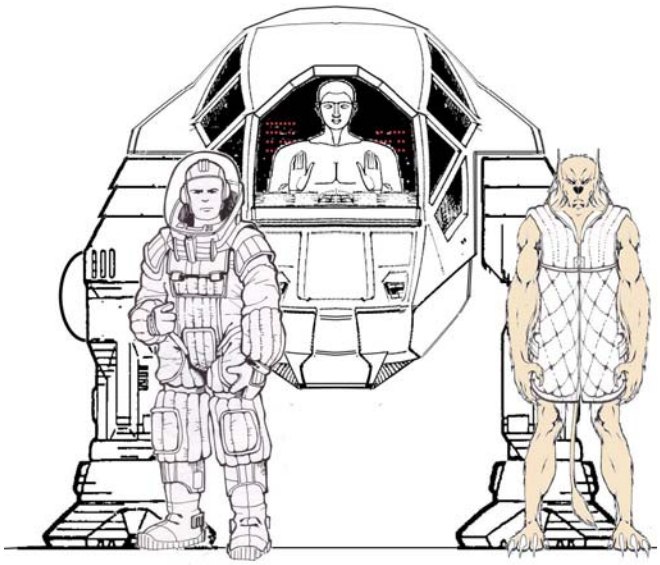
SoundProof is a barrier to sound.

PsiShield is a barrier to psionic activity.

Insulated is a protection against heat, cold, and shock.

Sealed is a barrier to liquids and gases.





Left to Right. Vacc Suit-9, Oversize Hostile Environ Unit -11, Aslan in Quilt-8, Battle Dress-13, Oversize Battle Dress-14, Titan Battle Dress-16, Cold Suit-7.

ARMOR DESCRIPTION

Model	Armor
(AltH) AU-15	Alternate Heavy Assault Unit -15

The basic information required to describe armor.

Ax: ARMOR EXTENSION

	Cost	Mass	QREBS	Ar=	Ca=	Fl=	Ra=	So=	Ps=	In=	Se=
Ax:	KCr396	429 kg	B= 0	21	19	19	19	19	05	19	19

Ax: KCr396 429 kg B= 0 Ar=21 Ca=19 Fl=19 Ra=19 So=19 Ps=05 In=19 Se=19

The basic information required to use armor.

DESCRIBING ARMOR

Armor, like Weapons) can be described in many ways depending on the format required: any format is possible as long as it provides the information necessary for the situation.

The Armor Description

Armor are described in a series of elements to form the LongName or abbreviated to form the Model. The LongName or Model contains enough information to allow a character to describe a type of Armor or Protection.

The LongName consists of the following elements:

Stage-Burden-Descriptor-Type-User -TL - [Options]

Type. Armor is produced in five distinct types based on function: Dress, Armor, Suit, Unit, and Item.

Descriptor describes the armor with a simple word based on purpose, or other function. For example, Battle or HazMat.

Burden identifies the relative weight, mass, or bulk. It is possible for Burden to be blank. For example, Light, Medium and Heavy.

Stage is the armors' position in the spectrum of sophistication in the developmental life cycle. It is possible for Stage to be blank. For example, Prototype, Basic, or Advanced.

User identifies the intended or designed user, usually by sophont, or by manipulator. Blank assumes the user is Human or Man or Hand. For example, Man, Hiver.

Tech Level identifies the Technological Level at which the Armor is commonly manufactured. TL is required**.**

Options indicate the installed options for the Armor.

The **Identifying Armor Chart** shows the various component names and abbreviations.

Elements of a LongName not necessary for a proper understanding may be omitted.

Model. LongName elements have abbreviations which are used to create the Armor Model.

Model is a jargon abbreviated Longname. Once a character is familiar with a specific Armor, references to it devolve to its abbreviation. VS-9 is a Tech Level 9 Vacc Suit. When used, Stage and Burden may be enclosed in parens to increase comprehension, and some familiarity is required before players can quickly understand (AltH) AU-15.

Given the restrictions of the alphabet, element abbreviations are not necessarily unique.

The Armor Extension

The capabilities of Armor are contained in the Armor Extension. This string of values details enough information to allow a character to use Armor. The Armor Extension is a variable length string: only such information as is needed is included.

The Prefix. The Armor extension begins with the prefix Ax:

The Elements. Following the prefix, the Armor Extension includes

AX: Cost - Mass - QREBS - Ar Ca Fl Ra So Ps In Se

Cost. The cost of the Armor in Credits.

Mass. The mass (more-or-less the weight) of the Armor expressed in kilograms (unless otherwise identified).

QREBS. The QREBS values for the Armor (if known). Various formats are used to identify specific QREBS values.

Armor and Protection Values (Ar= Ca= Fl= Ra= So= Ps= In= Se=). The specific armor and protection values for the armor, including Armor=, Cage=, FlashProof=, RadProof=, SoundProof=, PsiShield=, Insulated=, and Sealed=. Elements with zero values can be omitted. For example, Cold Suit-7 In=16 is enough to describe the protection that it provides.

USING ARMOR

Armor absorbs hits, wounds, injuries, or effects under the V1 or V2 hit systems.

The Hit System V1. The Basic Hit System (version 1) provides a simple hit mechanic for resolution of combat. V1 is intended for use with non-player characters (and especially hordes of NPCs) when speed of resolution is important.

The Hit System V2. V2 Damage inflicts different types of damage based on the specific weapon. Armor is rated against V2 Damage to absorb different types of damage.

DESIGNING ARMOR

Armor can be created randomly, or by design.

Random Creation. The **ArmorMaker** system produces armor based on die rolls. Randomly created armor can be used in a variety of encounters with adversaries, or to define trade goods.

Design. Armor can be designed by substituting selections for die rolls in the **ArmorMaker** system.

Armor is designed using the Armor Fillform. The Fillform guides the designer through the process with spaces for information and references to the applicable charts.

Deliberate Design

The deliberate design process begins with a blank Armor Fillform. In each step, the Chart Number indicates the Armor Chart from which the information is selected.

Chart 3. Select the armor **Type**. Record TL, Range, Mass, Armor Values, and Cost.

Select the Armor **Descriptor**. Record TL, Range, Mass, Armor Values, qreBs (Burden), and Cost.

Select an appropriate **Burden** and record its TL, Range, Mass, Armor Values, qreBs (Burden), and Cost.

Select an appropriate **Stage** and record its TL, Range, Mass, qreBs (Burden), and Cost. Observe the requirements under Comment.

Chart 4. Select an appropriate **User** and record its effects.

Review the Armor Type, Descriptor, and Stage for applicable notes and record this information.

Fillform. For each column, compute the totals. Tech Levels sum. Some entries under Mass may multiply. Burdens sum. Some costs multiply.

Complete the QREBS entries with the calculated Burden (and add any other QREBS entries dictated by comments).

Return To Chart 4. Calculate the performance details of the Armor for Strength, Dexterity, and Endurance.

Record The Armor Information.

Random Creation

The random creation process begins with a blank Armor Fillform and the Random Armor Creation Chart 8.

Using 1D and 2D as directed, roll for each element of the weapon on Chart 9 from **right to left** in the order:

Type, Descriptor, Burden, Stage, and User.

Simple Armor. A simple armor system can be created directly from the chart (Tech Levels are included).

Complete Armor Descriptions. Using the information created from Chart 8, return to Deliberate Armor Design and determine its details from the Charts.

Some Designs Are Impractical. Some combinations of elements may not make sense PLtBS-7 Prototype Light Battle Suit-7. It is the Referee's responsibility to discard the design as nonsensical or to justify the design based on local sophont cultural preferences.

UNDERSTANDING THE ARMOR ELEMENTS

Each Element of the Armor description has meaning. Once Armor has been created, consult the supporting paragraphs for a better understanding of its function and operation.

ARMOR TYPES

Armor falls into five distinct types based on size, function, and use: **Dress, Armor, Suit, Unit, and Item.**

Armor is distinguished by three specific characteristics: Power, Morph, and Braced.

Power. An Armor system may be Powered or Unpowered. Powered systems have greater or enhanced physical capabilities; Unpowered depends on the physical capabilities of the user.

Morphic. Systems may be Morphic (similar in shape to the user, or Non-Morphic (structured without regard to the shape of the user). Morphic indicates a similarity to the shape of the user, rather than an ability to change shape.

Braced. A system may be Braced (internally structured to withstand extremes of force, primarily recoil) or Unbraced (without specific reinforcement).

Dress is Powered, Morphic, and Braced.

Armor (as a type) is Powered, Morphic, and Unbraced.

Suits are Unpowered, Morphic, and Unbraced.

Units are Powered, Non-Morphic, and may be Braced or Unbraced.

Items are individual components: specific pieces of armor or protection (helmets, cuirasses, or greaves, for example).

ARMOR TYPES

		Morphic		Non-Morphic	
		Braced	Unbraced	Braced	Unbraced
	Powered	**Dress**	**Armor**	**Unit (or Item)**	
	Unpowered	impractical	**Suit**	impractical	impractical

Dress

The term Dress is derived from Battle Dress: a standard combat uniform worn by soldiers. Over time, the Dress element has become the term for the ultimate in military powered armor.

The significant element of Dress is that it is braced against high recoil.

Armor

All non-Dress powered morphic battlefield or military protection are called Armor.

Suit

Protective unpowered morphic coverings on or off the battlefield are called Suits. They range from simple Environ Suits and Vacc Suits to Hazmat Suits or Police Suits.

Suits may have an armor component.

Unit

The distinction between Armor and Vehicle becomes blurred with the introduction of Units. Units are non-morphic: their shape and size are not specifically linked to the user. A human operated Unit is not human-shaped or sized.

Item

Items are stand-alone pieces of equipment which serve to protect the bearer. For example, a buckler is an unpowered armor item.

ARMOR DESCRIPTORS

Descriptor is a statement of the specific function or purpose of the system, or of the effect which it counters. When paired with an Armor Type, it provides a basic statement of the Armor and its function.

A Descriptor may apply to several different types of Armor, but not necessarily to every Armor Type.

(blank). The Armor has no modifications or effects based on Descriptor.

<>Carrier. The system is designed as a weapon carrier, typically integral to, or mounted on, the system. Select a weapon which the system is capable of carrying.

Assault. The (relatively) lightweight system is intended for short-term (hours) operations against an enemy force.

Battle. The system incorporates protections against most dangers, attacks, and threats on the battlefield.

Boarding. The system is tailored for zero-G operations against interplanetary and interstellar vessels.

Cold. The primary purpose of the system is protection against environmental low temperatures.

Combat. The system is intended for medium-term operations (days) against an enemy force.

Drop. The system is structured to protect against extremes temperatures of orbital entry and against battlefield dangers.

Environ. The system protects against typical and ordinary world surface environmental threats: temperature, vacuum, light.

Combat Environ. The system adds protection against the threats of the battlefield to the elements of Environ.

Exploration. The system is designed for long-term (multiple days) use while providing protection against typical and ordinary world surface environmental threats: temperature, vacuum, light.

Hazmat. The system protects against hazardous materials and situations. HazMat can be produced as Armor, but rarely (if ever) as Dress.

Hostile Environ. The system includes protections against extreme environmental conditions.

Hot. The primary purpose of the system is protection against environmental high temperatures.

Police. The system incorporates protections against hazards in a law enforcement environment.

Prospector. The system adds survey and search tools to a hostile environ capability.

Sapper. The system adds combat engineer functions to combat environ capabilities.

Vacc. The system provides protections against vacuum and functionality in a zero-G environment.

Labor. The system utilizes enhanced Strength to perform manual labor functions.

BURDEN

Burden is the spectrum of effects based primarily on weight, mass, and bulk.

Disposable. The armor is manufactured from inexpensive materials to reduce cost; it has a usable lifetime measured in days.

Heavy. The armor is significantly heavier than the standard armor, but provides greater protection.

Light. The armor is significantly lighter than the standard armor and thus easier to use, but at a cost in protection.

Medium (the term is often omitted). The armor has no specific enhancements with the Burden classification.

Vlight. The armor is extremely light, but at a reduction is protection.

Oversize. The armor is oversized: approximately twice the size of standard armor.

Titan. The armor is approximately triple the size of standard armor.

STAGE

Stage is the spectrum of effects based on the technological product development cycle.

(blank). The armor has no modifications or effects based on Stage.

Advanced. The armor is significantly better than the standard version, and features lower weight and excellent ergonomic design.

Alternate. The armor uses an alternate technology to achieve its effects.

Basic. The armor is a stripped down design with greater weight and lower cost.

Early. The armor is a preliminary design with the bugs not yet worked out.

Enhanced. The armor includes additional features.

Experimental. The armor is an early test model.

Improved. The armor features small improvements.

Modified. The armor features improvements.

Prototype. The armor is a hand made model.

Standard (often omitted). The armor has no specific enhancements with the Stage classification.

Remote. The armor is remotely operated. The controller maintains control through a data link and operates the armor in real time.

Ultimate. The weapon represents the technological pinnacle of the design cycle.

USERS

User indicates the typical or intended user, either by species or by manipulator type.

(blank). The armor has no modifications or effects based on User. The default user is Man or Human.
If no User is specified, the armor is intended to be operated by a Human or similar being.

Universal. The weapon has compromise controls which are usable by most sophont users.

By Sophont

User may be described as a sophont.

Man. The intended user is Human (the military user term Man was adopted during the Second Empire to refer to Humans in general; although archaic in other uses, it is the accepted term here).

Aslan. The intended user is Aslan.

Hiver. The intended user is Hiver.

Vegan. The intended user is Vegan.

<Sophont>. The intended user is a specific Sophont, and various details are custom determined. For example, Plexxan (where Plexxan is a Sophont familiar to the characters, or otherwise described in available data banks).

TECHNOLOGY LEVEL

The weapon Tech Level indicates the relative level of technological sophistication required for manufacture. Any world with the indicated Tech Level and appropriate machinery can produce this item.

QREBS

Any acquired armor is ordinarily assumed to be QREBS=00000 (no effects under QREBS system).

If the Armor Design System imposes any QREBS elements (for example, B= -2), that imposed element applies to the armor.

As Issued. A armor with only the imposed QREBS elements is considered **As Issued**. It is typical of the armor as used in service. Most armors are in this state, and any reasonable character can research and determine this information.

Used. Any character may ask for a **Used** armor instead. The Referee then evaluates the armor under QREBS and records this information.

For example, Eneri Dinsha has acquired a Prototype Vheavy Gauss Carbine with QREBS Burden -5. The other elements are all zero. In an attempt have a better armor, he specifies it is Used. The Referee rolls for all five QREBS elements. -1 +2 -3 +4 -1. The +4 brings the existing Burden up to -1. The Used armor becomes QREBS -1 +2 -3 -1 -1. Eneri is better served by looking for a better armor.

OPTIONAL ACCESSORIES

Some armors are enhanced with accessories or modifications.

Comms

Armor systems have standard and optional communications systems.

Battlefield. Provides radio voice and data contact to Range= 6, with subchannels for individual communications.

Grid. Provides individual access to the local communications grid. Operates within Range=6 of a commercial communications center/tower. Charges may apply.

Standard. Open channel radio broadcast system to Range=5.

Command. Enhanced Battlefield system to Range=8. Typically installed in Officer's systems for communications with higher levels.

LOS. Direct Line-Of-Sight (Laser or similar) system. Secure against eavesdropping. Self-directed (user direction not required). R=6.

LR LOS. Direct Long Range Line of Sight (Laser or similar) system for communication. R= 10.

Relay Option. Automatic capability to receive and retransmit Battlefield or LOS to the intended recipient.

POWER AND LIFE SUPPORT

Armor systems have standard and optional power and life support systems.

Day. System power and life support is sufficient for approximately one day of operation. Standard storage racks recharge the system when not in use.

The system provides breathing gases, user accessible drinks and snacks, and basic waste systems suitable for approximately one day.

Days. System power and life support is sufficient for several (= 2 to 3) days of operation. Standard storage racks recharge the system when not in use.

The system provides breathing gases, user accessible energy-supplement drinks and snacks, and waste systems suitable for several (= 2 to 3) days.

Week. On-board fusion power module supports operations for approximately one week of operation. The system is recharged by replacement of a fusion power cartridge.

The system provides breathing gases, user accessible drinks and meals, and basic waste systems suitable for approximately one week.

The system includes an on-board diversion system with music, audio, video, and interactive entertainment.

Extended. On-board fusion power module supports operations for approximately more than a week (9-10 days). The system is recharged by replacement of a fusion power cartridge.

The system provides breathing gases, user accessible drinks and meals, and basic waste systems suitable for approximately one week.

The system includes an on-board diversion system with music, audio, video, and interactive entertainment.

Reserve Power and Life Support

Most systems include a reserve system with 1D additional hours of power.

SENSORS

Armor systems have standard and optional Sensor systems.

Basic Data. Every system provides a basic instrumentation package: speed, direction, and systems status (icons illuminate to warn of impending device failures).

Additional Data. The additional instrumentation package provides sophisticated instrumentation, including heads-up displays,

Direct. The system includes direct sensory input to the user through a faceplate and external audio sensors.

The operator can See and Hear external stimuli.

The system may have FlashProof and SoundProof to protect against sensory overload.

Enhanced. The system enhances sensory information processes external sensor information as requested by the user.

Each Enhanced Sensor package increases the Sense Constant for TWO senses by +08. If Vision is included, its Color sensitivity is increased TWO adjacent Colors.

Additional packages can be installed for additional sensitivity.

Sophonts

Systems created for non-humans provide tailored sensory input based on the sophont's specific sense structure.

Aware and Percept. Awareness and Perception are unimpeded by the physical structure of the armor system. The user can use the two senses normally.

CONTROLS

Armor systems have standard and optional control systems.

Self. Suits are unpowered and do not require control systems.

Feedback. Feedback systems respond directly to the user's limb movement to operate the powered systems. The details of operation are transparent to the user.

Manual. A system of controls (hand, manipulator, foot, head-movement, voice, and other) operate the unit. various performance activities

Wafer. The user is directly connected to the operating controls via his wafer jack. Operation is similar to the feedback system, and transparent to the user.

AutoPilot Option. Powered systems can be equipped with the AutoPilot option. The operator enters a destination and the system self-operates while the user sleeps or attends other functions.

Fine Control Option. The manipulators are tuned to increase their functional C2 (primarily as an offset to the system's diminished C2)

Other Options

Additional options are available.

Reflec. The surface of the armor is reflective: it deflects Laser attacks totally. However, Reflec requires a Mod +2 for visibility or to be spotted.

Treat C3 as Stamina. The Dress or Armor treats the users C3 as Stamina.

Drawbacks

Every system is a balance of features and drawbacks. For every feature added to a system a drawback must be included.

For each Option added, consult the Drawbacks Table. Cycle through the tables: the first roll is on Table 1 (and table 1 won't be used again), the second on Table 2, the third roll is on Table 3. The fourth roll is on Table 4. The fifth roll is on Table 2 again.

Uninstalling the Option removes the associated drawback (but you can't reinstall and roll again).

Fixing The Drawbacks. If drawbacks were easily fixed, they would not be Drawbacks. Each involves a Hopeless Diagnosis and a Hopeless Repair.

Table 1 Options- Minor Drawbacks

Use this table only once.

Cramped. The interior is very small. Reduce C3 minus 1.

Irritating Interior Noise. A non-specific interior noise continues unrelentingly. Reduce Hearing Constant minus 02. After C3 hours, reduce San minus 1.

Bad Taste in On-Board Drinks. Although there is no specific effect to this Drawback, the user is constrained to complain about it after each mission.

Interior Runs Hot. The equipment was created for a Hot World Sophont. Its standard temperature (incapable of adjustment out of its Hot range) imposes Hot-1 per Round. Perhaps the user needs to wear a Cold Suit while using it?

Interior Runs Cold. The equipment was created for a Cold World Sophont. Its standard temperature (incapable of adjustment out of its Cold range) imposes Cold-1 per Round. Perhaps the user needs to wear a Hot Suit while using it?

Poor Quality Diversion Unit. Although there is no specific effect to this Drawback, the user is constrained to complain about it after each mission.

Table 2 Options- Drawbacks

Drawbacks reduce the comfort or survivability of the equipment.

Vibration. The equipment has an unsettling and uncomfortable vibration. Reduce C minus 1.

Heavy Vibration. The equipment has several distinct vibrations which go in and out of phase. Reduce C3 minus 2.

Waste Heat Plume. The equipment is constructed to exhaust heat in a Size-6 plume visible in Bands NIFXZ,

Externally Loud. The equipment operates with deafening noise. Impose Bang-2 at vehicle exterior per Round.

Hard To Use. The operating controls for the equipment are poorly designed. EaseOfUse= -2.

Dangerous to Use. The equipment is poorly designed and poses a hazard to users. Safety= -2.

Table 3 Options- Major Drawbacks

Major drawbacks severely degrade performance.

Faulty Manipulator Joints. The components of the manipulators are faulty. Reduce C2 Half.

Faulty Limb Joints. The components of the limbs are faulty. Reduce Strength half.

Poor Manipulator Design. The manipulators are poorly designed. Treat C2 as Agility.

Highly Visible Shape or Finish. The equipment is poorly designed for concealment. Impose Visibility Mod +2.

Mag Flashes. The mechanism produces Mag Intensity = 5

Contaminated Life Support. There is a continuing contamination in the Life Support system. Check Endurance to avoid Infection-1.

Table 4 Options- Ultimate Drawbacks

Ultimate drawbacks impose active hazards to the user.

Strange Internal Harmonics. The equipment produces a variety of sounds and vibrations that create extreme discomfort. Check San daily.

Unsteady. The equipment is unsteady in operation. Randomly every hour, Check World Size for a stability failure. Failure produces a fall.

Rapid System Fatigue. The system is fatiguing. Treat C3 as Vigor.

Distracting Feedback. The equipment produces a variety of distracting input. Skill and Int halved.

Randomly Locks. The joints of the system randomly lock up. In active use, roll 2D for 12, in which case the equipment cannot move for one Round.

Hangar Queen. A Hangar Queen is a piece of equipment which users avoid if at all possible (hence, it rules the Hangar). Check Reliability daily.

ITEMS

Armor Items are independent pieces of equipment rather than system. Each is acquired individually.

The Basic Body Armors

The basic body armors are personal protections worn by characters as a natural effort to avoid injury, especially in combat.

Jack. A natural or synthetic leather jacket or body suit covering the torso and upper arms and legs. Jack is somewhat better than ordinary clothing in providing basic protection.

Mail. A flexible metal shirt providing basic protection against most attacks.

Mesh. A, jacket or body suit made of natural or synthetic leather and reinforced with a lining of flexible metal mesh, similar to chain mail but lighter and stronger.

Cloth. A heavy duty body suit tailored from ballistic cloth.

Quilt. An improved version of Cloth.

Plate. A protective unit of personal body armor constructed of ceramic or metal plates (often articulated to allow movement or flexibility).

Ablat. Ablat is fashioned from a material which will ablate (vaporize) when hit by laser fire. The vaporized material carries away the energy of the laser, protecting the user. Ablat has a basic protective value against attacks and is doubled against K (Burn) attacks.

Reflec. A flexible coating for personal armor which entirely deflects Laser. When worn as an outer protection, it increases visibility (Visibility Mod +2). It can be worn under clothing or other armor, but when hit by Laser, reduces the outer armor layer double the damage inflicted in penetrating it.

Coat. A basic cold weather clothing unit.

Heavy Coat. A more effective cold weather clothing unit.

The Breathers

The Breathers provide protection or support in strange atmospheres.

Respirator. A small compressor allowing breathing in Air-3 (Vthin Atmosphere). An alternative name is Compressor.

Filter. A breathing filter which protects against taint in Air-7 and Air-9. It is effective only against T (Poison).

Combination. Breathing apparatus combining Filter and Respirator. It allows breathing Air-2 and Air-5.
It is effective only against T (Poison).

Air Tanks. A complete set of air reservoirs and the appropriate breathing mask to allow independent breathing in smoke, dust, gas, or exotic atmospheres. The tanks are filled with the appropriate breathing gases (for example, Air-4, Air-8) for the user. This apparatus can be used underwater.

Breather. An apparatus which removes waste gases and recycles breathing gases to the user. The

Rebreather. An improved version of the Breather for better performance and efficiency.

Gill. A breathing apparatus for air breathers which extracts oxygen from water.

Helmets and Head Protection

There are a variety of protections for heads and senses.

Military Helmet. Basic head protection for protection against fragments from and some bullets.

Full Helmet with Visor. An improved military helmet providing full head protection.

Ear Protectors. Basic Sopundproof ear protection.

Flash Goggles. Basic Flashproof eye protection

Sunglasses. Non-military Flashproof eye protection.

Cool Sunglasses. Non-military Flashproof eye protection. Wearing Cool Sunglasses improves perceived Social Standing or Charisma +1.

Psionic Shield. An apparatus to protect against psionic activity.

HazMat and HazSit Equipment

Hazardous Material and Hazardous Situation equipment provides some degree of safety when dealing with hazardous events.

Thermal Blanket. A basic reflective sheet which protects against Hot or Cold.

Fire Shield. An enhanced Thermal Blanket which also protects against fire.

Rescue Ball. A collapsed protective structure providing shelter in emergency situations. The ball will hold and support four individuals for a week.

Desert Cloak. A basic fabric article of clothing which provides a degree of protection against the desert environment.

Skills and Knowledges

The operation of armor systems is governed by a variety of skills and knowledges.

BattleDress governs Dress and Armor.

Vacc Suit governs Suits.

Legged (a Knowledge under Driver) governs most Units.

RATING AN ARMOR SYSTEM

The performance of a system depends on the physical characteristics C1 C2 C3 of the operator.

Suits reflect the user's Characteristics and may reduce C2 and C3.

Armor and Dress (because they are Powered) multiply Strength. Oversize and Titan provide greater Strength multiplication.

Using the **Evaluating A System Chart**, determine the changes to Characteristics that are dictated by the System.

For reference, record the temporarily altered characteristics in the format:

User is 777777
Armor Name = Str= Dex= End=
BattleDress-13 = Str= (70) Dex= 5 End= 6

Note Increased Strength in Parens as a real number: A character with Str-7 notes his increased Strength in Parens as (7). If this were Dress with an increase of x10 it would be (70).

For example, Imperial Reserve Star Marine Captain Sir etc 88888A discovers, when reporting for his monthly drill and training session, that they have just been re-equipped with

AltH DD-14 Alternate Heavy Drop Dress -14

They spend the day checking out the new equipment and reading the manuals.

DD-14s are Dress, so the governing skill is BattleDress.

It multiplies Strength x 10, reduces Dexterity -2, and reduces Endurance -1. The Captain functions as

AltHDD-14 = Str=(80) Dex= 6 End= 7

"But wait!" says the Captain, "These are loaded with options.

"Option-s. Fine Control, and…

AltHDD-14 = Str=(80) Dex= 9 End= 7

(the Fire Control Option adds back +3 to C2)

"Option-v, PsiShield, and
"Option-t, Reflec anti-laser coating, and
"Option-x, Stamina."

AltHDD-14 = Str=(80) Dex= 9 End= 7

They try one of them out that afternoon and he starts to see the drawbacks to the system as well.

"Ugh. That thing is cramped.

AltHDD-14 = Str=(80) Dex= 9 End= 6

"And its really hard to use.

qrEbs= -2.

"And the manipulators are very poorly designed."

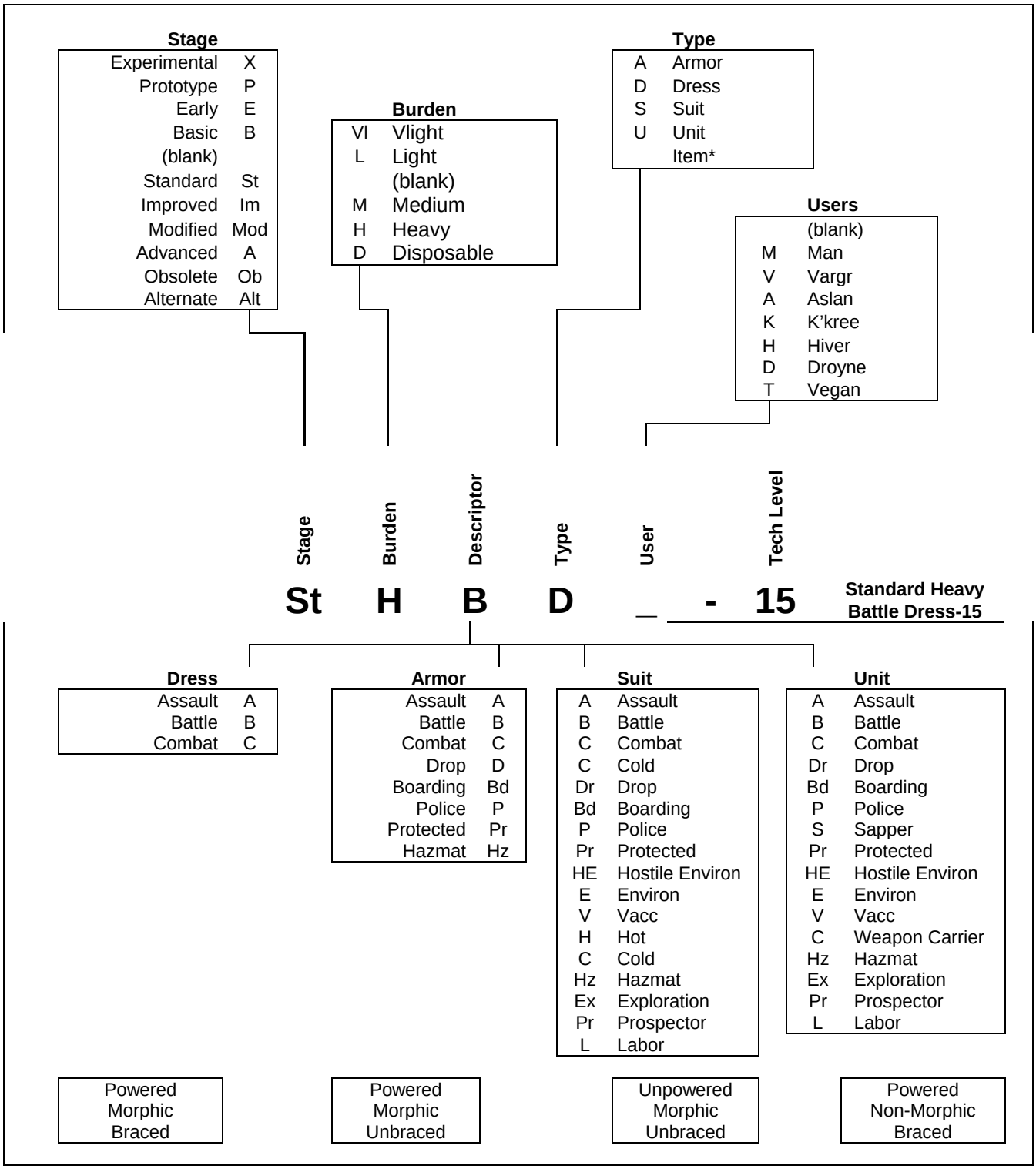
AltHDD-14 = Str=(80) Agi= 9 End= 6

(treat C2 as Agility).

So he hasn't yet seen that it Locks Up on a 12. Maybe he'll notice that in combat?

Identifying Armor

The Universal Armor Profile can be deciphered using the table below.



Armor Design

As the armor is designed insert the design values and details into this Fillform. Values may be inserted in any order as the design is considered: the ultimate requirement is that the values balance and properly reflect the charts and tables.

Armor 2

BUILDING ARMOR

This Fillform allows an interactive design process which ultimately produces a final armor design. The final information is evaluated and recorded.

Tech Level. Tech Level for armor is the minimum level required for manufacture.

ARMOR MANUFACTURER

Manufacturer			
Surface or Orbital Factory?	TL	LL	

Chart	Item	Q	R	E	B	S	Model	Tech Level	Mass	Armor	Cage	FlashProof	RadProof	SoundProof	PsiShield	Insulated	Sealed	KCr 000,	Cr ,000
3	Item																		
3	Descriptor																		
3	Burden																		
3	Stage																		
	User																		
4	Controls																		
	Sensors																		
	Comms																		
	Power & LS																		
	Add-Ons																		
	QREBS=																		
	Totals																		

ARMOR DESCRIPTION

Model	Armor

The basic information required to describe armor.

Ax: ARMOR EXTENSION

	Cost	Mass	QREBS	Ar=	Ca=	Fl=	Ra=	So=	Ps=	In=	Se=
Ax:	KCr=	kg B=	Ar=	Ca=	Fl=	Ra=	So=	Ps=	In=	Se=	

The basic information required to use armor.

USERS

Specify the Intended Sophont User.

Protection Items

Armor 3

Code		Type	TL	Mass	Armor	EMCage	Flashproof	RadProof	SoundProof	PsiShield	Insulated	Sealed	Comment	Cr
The Basic Body Armors														
J		Jack	1	1	5						4			50
Ma		Mail	4	2	6									400
M		Mesh	7	1	10						2			150
K		Cloth	8	1	14						6			250
Q		Quilt	9	1	18						9			600
P		Plate	6	1	22								B=+2	900
A		Ablat	9	3	12						8		B=+3 2x vs K*	375
R		Reflec	10										deflects Laser	10
C		Coat	1	2							5			100
hC		Heavy Coat	2	3							10			200
Sh		Shield	2	3	12									100
aSh		Advanced Shield	8	2	14		8							400
The Breathers													**Protects against:**	
F		Filter	3	1								6	Air-79 only vs T*	10
F		Filter	8	1								6	Air-79 only vs T*	40
F		Filter	10	0								6	Air-79 only vs T*	80
B		Breather	7	2		4						6	Air-23479A	200
B		Breather	8	2		8						6	Air-23479A	400
B		Breather	10	1		10						6	Air-23479A	600
C		Combination	5	1		4						12	Air-24 only vs T*	150
C		Combination	8	1		8						12	Air-24 only vs T*	300
C		Combination	10	1		10						12	Air-2, -4 only vs T*	500
R		Compressor/Respirator	5	1		4						12	Air-3	100
R		Compressor/Respirator	8	1		8						12	Air-3	100
R		Compressor/Respirator	10	1		10						12	Air-3	100
aT		Air Tanks	5	4								12	Air-234579A	500
aT		Air Tanks	9	3								12	Air-234579A	500
aT		Air Tanks	11	2								12	Air-234579A	500
rB		ReBreather	10	1		10						12	Air-234579A	200
G		Gill	11	4								18	Water	4000
Helmets and Head Protection														
H		Military Helmet	4	1	8				5				B= +1	100
H+		Full Helmet with Visor	8	1	10	5	12	5	5		5		B= +2	300
cH		Crew Helmet	8	1	6	6					5		B=+1	300
eP		Ear Protectors	4						12					100
G		Goggles	4				6							50
fG		Flash Goggles	8				12							200
sG		Sunglasses	4				6							100
sG+		Cool Sunglasses	5				6							200
PsiS		Psionic Shield Hemet	12	1	3				4	15				3000
		Shemagh	2			2					2			
		Beret	4											
HazMat and HazSit Equipment														
		Thermal Blanket	8	1							12			50
		Fire Shield	8	2							18		only vs KHQ	100
		Rescue Ball	10	200	18	18	18	18	18		18	18	immobile	9000
		Desert Cloak	3	1			5				5			200

*Some protections only operate against specific Effects (K= Burn).

Protection Types

Armor 4

	Code	Type	TL	Mass	Armor	EMCage	Flashproof	RedProof	SoundProof	PsiShield	Insulated	Sealed	Comment	Cr
Item	A	Armor	8	30	7	3	3	3	3	1	3	3		20,000
	D	Dress	10	40	9	6	6	6	6	1	6	6		40,000
	S	Suit	5	10	2	1	1	1	1	1	1	1		1,000
	U	Unit	9	200	4	2	2	2	2	1	2	2		60,000
Descriptor	0	(blank)	0	1	1	1	1	1	1	1	1	1		x 1
	Wpn	< > Carrier	1	2	8	1	1	1	1	1	1	1		x 3
	A	Assault	4	1.5	2	2	2	2	2	2	2	2		x 3
	B	Battle	3	2.5	5	5	5	5	5	5	5	5		x 5
Armor and	B	Boarding	3	1.2	4	1	4	1	2	1	1	3		x 4
protection	C	Cold	2	0.2	1	1	1	1	1	1	6	1		x 0.2
multiply	P	Combat	3	2	4	4	4	4	4	4	4	4		x 4
	C	Combat Environ	7	2.5	7	4	5	5	5	1	5	5		x 6
	D	Drop	2	3	8	1	8	1	8	1	1	8		x 3
	En	Environ	2	0.5	4	4	4	1	4	1	20	10		x 1.5
	Exp	Exploration	1	1	5	1	1	1	5	1	8	8		x 7
	Haz	Hazmat	0	1.3	2	6	6	6	6	1	12	12		x 9
	HE	Hostile Environ	1	1.2	8	1	1	8	1	1	8	12		x 8
	H	Hot	1	0.3	2	7	5	5	5	1	5	5		x 0.6
	L	Labor	-1	0.7	1	1	1	1	1	1	6	6		x 4
	P	Police	0	0.6	3	1	5	1	1	1	1	2		x 1.7
	Pr	Prospector	2	2	2	2	1	1	1	1	3	5		x 6
	Pro	Protected	2	2	2	2	2	2	2	1	3	4		x 7
	S	Sapper	2	1.2	5	6	6	1	6	1	8	8		x 7
	V	Vacc	4	1	5	5	0	1	1	1	5	5		x 10
Burden		(blank)	0	1	0	0	0	0	0	0	0	0		x 1
	D	Disposable	3	0.9	-5	-5	-5	-5	-5	0	5	-5		x 0.5
	H	Heavy	1	1.3	8	10	10	10	10	0	15	10		x 2
Armor and	Lt	Light	0	0.7	-3	-3	-3	-3	-3	0	5	-3		x 1.1
Protection	M	Medium	0	1	0	0	0	0	0	0	10	0		x 1
add	S	Small	0	0.5	0	0	0	0	0	0	5	0		x 0.5
	Vl	Vlight	1	0.6	-5	-5	-5	-5	-5	0	-2	-5		x 2
	OS	Oversize	1	8	12	8	8	8	8	0	8	8		x10
	T	Titan	3	27	16	8	8	8	8	0	8	8		x30
Stage		(blank)	0	1	0	0	0	0	0	0	0	0		x 1
	A	Advanced	3	0.8	10	10	10	10	10	3	30	10		x 2
	Alt	Alternate	1	1.1	5	5	5	5	5	0	15	5		x 1.1
Armor and	B	Basic	0	1.3	-5	-5	-5	-5	-5	0	-5	-5		x 0.7
protection	E	Early	-1	1.7	-2	-2	-2	-2	-2	0	-2	-2		x 1.2
add	En	Enhanced	1	2	3	3	3	3	3	0	9	3		x 4
	X	Experimental	-2	2	-8	-8	-8	-8	-8	0	-8	-8		x 4
	Im	Improved	1	1	6	6	6	6	6	0	18	6		x 1.1
	Mod	Modified	2	0.9	3	3	3	3	3	0	9	3		x 1.2
	Ob	Obsolete	4	0.7	3	3	3	3	3	0	9	3		x 0.5
	P	Prototype	-1	1.9	-4	-4	-4	-4	-4	0	-4	-4		x 3
	St	Standard	1	1	0	0	0	0	0	0	0	0		x 1
	Re	Remote	2	1.5	0	0	0	0	0	0	0	0		x4
	Sl	Slaved	2	1.5	0	0	0	0	0	0	0	0		x4

Protection Types

Armor 5

STANDARD SUBSYSTEMS	Dress (chq7)	Armor (chq3)	Suit (bhp1)	Unit (ahr3)	OS/ Titan
Comms	Battlefield	Battlefield	Grid	Standard	- -
Sensors	Basic	Basic	Basic	Basic	- -
Controls	Feedback	Feedback	Self	Manual	Wafer
Power	Week	Days	Day	Days	- -

OPTIONS

Code	Descriptor		Comment
Comms			
a	Standard		R= 5
b	Grid		R= 6
c	Battlefield		R= 6
d	Command		R= 8
e	LOS		R= 6
f	LR-LOS		R=10
g	Relay Option		
Sensors			
h	Basic		
i	Additional		
j	Direct		
k	Enhanced1		
l	Enhanced2		
m	Enhanced3		
Controls			
n	Self		
p	Feedback		
q	Manual		
r	Wafer		Requires WJ
s	AutoPilot		
t	Fine Control		C2 +3
Other Options			
u	Reflec		Plus Visible Mod
v	Spot Armor		
w	PsiShield		
x	Stealthy		Minus Vis Mod
y	Stamina		C3 = Stamina
Power and Life Support			
0	Not Applicable		
1	Day		
3	Days		
7	Week		
9	Extended		

Install and note options only if not standard equipment.

DRAWBACKS

Options have no cost.

For each Option added, consult the Drawbacks Table. Cycle through the tables: the first roll is on Table 1 (and table 1 won't be used again), the second on Table 2, the third roll is on Table 3. The fourth roll is on Table 4. The fifth roll is on Table 2 again.

Uninstalling the Option removes the associated drawback (but you can't reinstall and roll again).

Table 1 Minor Drawbacks (only once)

1	Cramped.	C3 -1.
2	Irritating Interior Noise.	Hearing Mod -2.
3	Bad Taste In Drinks.	No specific effect.
4	Interior Runs Cold.	Cold-1 per Round.
5	Interior Runs Hot.	Hot-1 per Round.
6	Poor quality diversion unit.	No specific effect.

Table 2 Drawbacks

1	Vibration.	C3 -1
2	Heavy Vibration.	C3 -2
3	Waste Heat Plume.	Mod +4 for IR Detection
4	Externally Loud.	Bang-2 per Round
5	Hard To Use.	qrEbs= -2.
6	Poorly Planned Interior.	qrebS= -2.

Table 3 Major Drawbacks

1	Faulty Manipulator Joints.	Reduce C2 Half.
2	Faulty Limb Joints.	Strength Reduced Half.
3	Poor Manipulator Design.	Treat C2 as Agility.
4	Highly Visible Shape	Visibility Mod +2.
5	Mag Flashes	Mag Intensity = 5
6	Contaminated Life Support	Infection Chance

Table 4 Ultimate Drawbacks

1	Strange Internal Harmonics.	Check San daily.
2	Unsteady.	Trip and Fall
3	Rapid System Fatigue.	Treat C3 as Vigor.
4	Distracting Feedback.	Skill and Int halved.
5	Randomly Locks	2D= 12 locks up.
6	Hangar Queen.	Check Reliability daily.

EVALUATING A SYSTEM		Dress	Armor	Suit	Unit	OverSize	Titan
C1	Strength	x 10	x 10	x 1	x 10	x 100	x 1000
C2	Dexterity Agility Grace	-2	- 2	- 2	- 2	- 4	- 4
C3	Endurance Vigor Stamina	-1	-2	-3	0	- -	- -
	Skill=	BattleDress	BattleDress	Vacc Suit	Legged	- -	- -
	Maximum Speed=	2	1	1	2	2	2

The performance of a system depends on the Characteristics of the operator.

ArmorMaker

Most personal and military weapons can be created using this chart.

Armor9

	DESCRIPTOR	ITEM
1D	1 Assault	1 Dress Powered. Morphic, Braced
	2 Battle	
	3 Boarding	
	4 Combat	
	5 Drop	
	6 Police	

	USER	MANIPULATOR
2D	2 <S1>	Socket
	3 Droyne	Socket
	4 Vegan	Tentacle
	5 Vargr	Universal
	6 <blank>	Hand
	7 Man	Hand
	8 <blank>	Hand
	9 Aslan	Paw
	10 Hiver	Grasper
	11 K'kree	Gripper
	12 <S2>	Gripper

2D	2 Assault		2 Armor. Powered, Morphic, Unbraced
	3 Battle		
	4 Boarding		
	5 Combat		
	6 Drop		
	7 Environ		
	8 Hazmat		
	9 Hostile Environ		
	10 Police		
	11 Protected		
	12 Sapper		

2D	1 Slaved		
	2 Enhanced	1	<blank>
	3 Prototype	-1	Titan
	4 Early	-1	Disposable
	5 Basic	0	Heavy
	6 <blank>	0	Light
	7 Standard	1	<blank>
	8 Modified	2	Medium
	9 Improved	1	Small
	10 Advanced	3	Oversize
	11 Alternate	1	Vlight
	12 Obsolete	4	<blank>
	13 Remote		

3D	3 Boarding		3 Suit Unpowered, Morphic, Unbraced.
	4 Drop		
	5 Assault		
	6 Battle		
	7 Combat		
	8 Cold		
	9 Exploration		
	10 Environ		
	11 Vacc		
	12 Hostile Environ		
	13 Hot		
	14 Police		
	15 Prospector		
	16 HazMat		
	17 Protected		
	18 Sapper		

	1	2	3
	COMMS	CONTROLS	POWER
1D	1 Standard	Self	Day
	2 Grid	Feedback	Day
	3 Battlefield	Manual	Days
	4 Command	Wafer	Days
	5 LOS	AutoPilot	Week
	6 LR-LOS	Fine Control	Extended

	CONTROLS	ADD-ONS	
1D	1 Basic	Reflec	
	2 Additional	Spot Armor	
	3 Direct	PsiShield	
	4 Enhanced1	Stealthy	
	5 Enhanced2	Stamina	
	6 Enhanced3	Reactive	Relay Option

3D	3 Drop		4 Unit Powered, NonMorphic, Braced.
	4 Assault		
	5 Battle		
	6 Cold		
	7 Combat		
	8 Weapon Carrier		
	9 Labor		
	10 Environ		
	11 Exploration		
	12 Hostile Environ		
	13 HazMat		
	14 Sapper		
	15 Hot		
	16 Boarding		
	17 Police		
	18 Prospector		

Armor Examples

The following weapon examples demonstrate the output of the armor generation system.

Armor 7-1

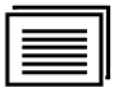
TL	Model	LongName	Cost	kg	Ar	Ca	Fl	Ra	So	Ps	In	Se
5	HazS-5	Hazmat Suit -5	Cr9000	13	12	6	6	6	6	1	12	12
6	(XM) PA-6	Experimental Medium Police Armor -6	Cr136000	36	13	0	7	0	0	1	0	0
6	(St) PS-6	Standard Police Suit -6	Cr1700	6	6	1	5	1	1	1	1	2
6	HS-6	Hot Suit -6	Cr600	3	4	7	5	5	5	1	5	5
6	ExpS-6	Exploration Suit -6	Cr7000	10	10	1	1	1	5	1	8	8
6	(BH) HazS-6	Basic Heavy Hazmat Suit -6	Cr12600	21	15	11	11	11	11	1	17	17
6	HES-6	Hostile Environ Suit -6	Cr8000	12	16	1	1	8	1	1	8	12
7	CS-7	Cold Suit -7	Cr200	2	2	1	1	1	1	1	6	1
7	ProS-7	Prospector Suit -7	Cr6000	20	4	2	1	1	1	1	3	5
7	DS-7	Drop Suit -7	Cr3000	30	16	1	8	1	8	1	1	8
7	EnvS-7	Environ Suit -7	Cr1500	5	8	4	4	1	4	1	20	10
8	HazA-8	Hazmat Armor -8	Cr180000	39	42	18	18	18	18	1	36	36
8	(EnM) ProS-8	Enhanced Medium Prospector Suit -8	Cr24000	40	7	5	4	4	4	1	6	8
8	(X) PD-8	Experimental Police Dress -8	Cr272000	48	19	0	22	0	0	1	0	4
8	(ImS) ProS-8	Improved Small Prospector Suit -8	Cr3300	10	10	8	7	7	7	1	9	11
8	(EnM) DS-8	Enhanced Medium Drop Suit -8	Cr12000	60	19	4	11	4	11	1	4	11
8	(ImM) EnvS-8	Improved Medium Environ Suit -8	Cr1650	5	14	10	10	7	10	1	26	16
8	(BT) PS-8	Basic Titan Police Suit -8	Cr35700	210	17	4	8	4	4	1	4	5
8	BS-8	Battle Suit -8	Cr5000	25	10	5	5	5	5	5	5	5
8	PA-8	Police Armor -8	Cr34000	18	21	3	15	3	3	1	3	6
8	(AltS) CS-8	Alternate Small Cold Suit -8	Cr110	1	7	6	6	6	6	4	11	6
8	(ES) HazU-8	Early Small Hazmat Unit -8	Cr324000	221	22	10	10	10	10	1	22	22
8	LU-8	Labor Unit -8	Cr240000	140	4	2	2	2	2	1	12	12
8	(H) DS-8	Heavy Drop Suit -8	Cr6000	39	24	11	18	11	18	1	11	18
9	(AltT) PS-9	Alternate Titan Police Suit -9	Cr56100	178	27	14	18	14	14	4	14	15
9	(AOs) HazS-9	Advanced Oversize Hazmat Suit -9	Cr180000	83	34	24	24	24	24	1	30	30
9	(ELt) HEU-9	Early Light Hostile Environ Unit -9	Cr633600	285	27	0	0	11	0	1	11	19
9	(EnLt) HazA-9	Enhanced Light Hazmat Armor -9	Cr792000	54	42	18	18	18	18	1	36	36
9	(StH) ProS-9	Standard Heavy Prospector Suit -9	Cr12000	26	12	12	11	11	11	1	13	15
9	(X) SU-9	Experimental Sapper Unit -9	Cr1680000	480	12	4	4	0	4	1	8	8
9	(EnS) BdS-9	Enhanced Small Boarding Suit -9	Cr8000	12	11	4	7	4	5	1	4	6
9	(StS) BS-9	Standard Small Battle Suit -9	Cr2500	12	10	5	5	5	5	5	5	5
9	(H) PA-9	Heavy Police Armor -9	Cr68000	23	29	13	25	13	13	1	13	16
9	(E) DA-9	Early Drop Armor -9	Cr72000	153	54	1	22	1	22	1	1	22
9	AS-9	Assault Suit -9	Cr3000	15	4	2	2	2	2	2	2	2
9	(PS) PD-9	Prototype Small Police Dress -9	Cr102000	22	23	2	26	2	2	1	2	8
9	(AltS) PA-9	Alternate Small Police Armor -9	Cr18700	9	26	8	20	8	8	4	8	11
9	PU-9	Police Unit -9	Cr102000	120	12	2	10	2	2	1	2	4
9	VS-9	Vacc Suit -9	Cr10000	10	10	5	0	1	1	1	5	5
9	(ModLt) SS-9	Modified Light Sapper Suit -9	Cr9240	7	10	6	6	1	6	1	8	8
9	(ET) SS-9	Early Titan Sapper Suit -9	Cr252000	550	24	12	12	7	12	1	14	14
9	(PT) DS-9	Prototype Titan Drop Suit -9	Cr270000	1 tons	28	5	12	5	12	1	5	12
9	(Os) LU-9	Oversize Labor Unit -9	Cr2400000	1 tons	16	10	10	10	10	1	20	20
9	(EM) EnvA-9	Early Medium Environ Armor -9	Cr36000	25	26	10	10	1	10	1	58	28
9	HEA-9	Hostile Environ Armor -9	Cr160000	36	56	3	3	24	3	1	24	36
9	HazU-9	Hazmat Unit -9	Cr540000	260	24	12	12	12	12	1	24	24
10	EnvA-10	Environ Armor -10	Cr30000	15	28	12	12	3	12	1	60	30
10	(AltOs) CbtS-10	Alternate Oversize Combat Suit -10	Cr44000	176	25	17	17	17	17	7	17	17
10	(BM) SA-10	Basic Medium Sapper Armor -10	Cr98000	46	30	13	13	0	13	1	19	19
10	(BS) DA-10	Basic Small Drop Armor -10	Cr21000	58	51	0	19	0	19	1	0	19
10	(E) BA-10	Early Battle Armor -10	Cr120000	127	33	13	13	13	13	5	13	13
10	(EH) HU-10	Early Heavy Hot Unit -10	Cr86400	132	14	22	18	18	18	1	18	18
10	(EnH) PA-10	Enhanced Heavy Police Armor -10	Cr272000	46	32	16	28	16	16	1	16	19
10	(EnOs) BS-10	Enhanced Oversize Battle Suit -10	Cr200000	400	25	16	16	16	16	5	16	16
10	(EnVl) CbtS-10	Enhanced Vlight Combat Suit -10	Cr32000	24	6	2	2	2	2	4	2	2
10	(ET) PA-10	Early Titan Police Armor -10	Cr1224000	826	35	9	21	9	9	1	9	12
10	(EVl) HEU-10	Early Vlight Hostile Environ Unit -10	Cr1152000	244	25	0	0	9	0	1	9	17

Armor Examples

The following weapon examples demonstrate the output of the armor generation system.

Armor 7-2

TL	Model	LongName	Cost	kg	Ar	Ca	Fl	Ra	So	Ps	In	Se
10	(ImH) PA-10	Improved Heavy Police Armor -10	Cr74800	23	35	19	31	19	19	1	19	22
10	(PM) DU-10	Prototype Medium Drop Unit -10	Cr540000	1 tons	28	0	12	0	12	1	0	12
10	(PS) BA-10	Prototype Small Battle Armor -10	Cr150000	71	31	11	11	11	11	5	11	11
10	(X) DD-10	Experimental Drop Dress -10	Cr480000	240	64	0	40	0	40	1	0	40
10	(EH) WpnU-10	Early Heavy < > Carrier Unit -10	Cr432000	884	38	10	10	10	10	1	10	10
10	(B) PD-10	Basic Police Dress -10	Cr47600	31	22	1	25	1	1	1	1	7
10	(Ob) HS-10	Obsolete Hot Suit -10	Cr300	2	7	10	8	8	8	1	8	8
10	(B) DA-10	Basic Drop Armor -10	Cr42000	117	51	0	19	0	19	1	0	19
10	HEU-10	Hostile Environ Unit -10	Cr480000	240	32	2	2	16	2	1	16	24
10	(ELt) BA-10	Early Light Battle Armor -10	Cr132000	89	30	10	10	10	10	5	10	10
10	WpnU-10	< > Carrier Unit -10	Cr180000	400	32	2	2	2	2	1	2	2
10	(ImLt) AS-10	Improved Light Assault Suit -10	Cr3630	10	7	5	5	5	5	2	5	5
10	HU-10	Hot Unit -10	Cr36000	60	8	14	10	10	10	1	10	10
10	(ALt) EnvS-10	Advanced Light Environ Suit -10	Cr3300	2	15	11	11	8	11	1	27	17
10	PD-10	Police Dress -10	Cr68000	24	27	6	30	6	6	1	6	12
10	ExpU-10	Exploration Unit -10	Cr420000	200	20	2	2	2	10	1	16	16
10	SA-10	Sapper Armor -10	Cr140000	36	35	18	18	3	18	1	24	24
10	DA-10	Drop Armor -10	Cr60000	90	56	3	24	3	24	1	3	24
11	EnvU-11	Environ Unit -11	Cr90000	100	16	8	8	2	8	1	40	20
11	(AltM) DA-11	Alternate Medium Drop Armor -11	Cr66000	99	61	8	29	8	29	4	8	29
11	(AltS) WpnU-11	Alternate Small < > Carrier Unit -11	Cr99000	220	37	7	7	7	7	4	7	7
11	(AM) LU-11	Advanced Medium Labor Unit -11	Cr480000	112	14	12	12	12	12	1	22	22
11	(BVl) PD-11	Basic Vlight Police Dress -11	Cr95200	18	17	0	20	0	0	1	0	2
11	(E) DD-11	Early Drop Dress -11	Cr144000	204	70	4	46	4	46	1	4	46
11	(ED) AS-11	Early Disposable Assault Suit -11	Cr1800	22	0	0	0	0	0	2	0	0
11	(EH) BdA-11	Early Heavy Boarding Armor -11	Cr192000	79	34	11	20	11	14	1	11	17
11	(En) WpnU-11	Enhanced < > Carrier Unit -11	Cr720000	800	35	5	5	5	5	1	5	5
11	(EnH) AS-11	Enhanced Heavy Assault Suit -11	Cr24000	39	15	15	15	15	15	2	15	15
11	(EnLt) SA-11	Enhanced Light Sapper Armor -11	Cr616000	50	35	18	18	3	18	1	24	24
11	(EnM) PD-11	Enhanced Medium Police Dress -11	Cr272000	48	30	9	33	9	9	1	9	15
11	(EnS) DA-11	Enhanced Small Drop Armor -11	Cr120000	90	59	6	27	6	27	1	6	27
11	(EnT) ProS-11	Enhanced Titan Prospector Suit -11	Cr720000	1 tons	23	13	12	12	12	1	14	16
11	(ES) DD-11	Early Small Drop Dress -11	Cr72000	102	70	4	46	4	46	1	4	46
11	(ImH) AS-11	Improved Heavy Assault Suit -11	Cr6600	19	18	18	18	18	18	2	18	18
11	(Lt) BdA-11	Light Boarding Armor -11	Cr88000	25	25	0	9	0	3	1	0	6
11	(ModH) HazA-11	Modified Heavy Hazmat Armor -11	Cr432000	45	53	31	31	31	31	1	49	49
11	(ModT) HES-11	Modified Titan Hostile Environ Suit -11	Cr288000	291	35	12	12	19	12	1	19	23
11	(StOs) VS-11	Standard Oversize Vacc Suit -11	Cr100000	80	22	13	0	9	9	1	13	13
11	(Vl) PD-11	Vlight Police Dress -11	Cr136000	14	22	1	25	1	1	1	1	7
11	(ELt) BU-11	Early Light Battle Unit -11	Cr396000	595	15	5	5	5	5	5	5	5
11	(M) CU-11	Medium Cold Unit -11	Cr12000	40	4	2	2	2	2	1	12	2
11	CU-11	Cold Unit -11	Cr12000	40	4	2	2	2	2	1	12	2
11	ProU-11	Prospector Unit -11	Cr360000	400	8	4	2	2	2	1	6	10
11	(St) PD-11	Standard Police Dress -11	Cr68000	24	27	6	30	6	6	1	6	12
11	(BT) LU-11	Basic Titan Labor Unit -11	Cr5040000	4 tons	15	5	5	5	5	1	15	15
11	BdA-11	Boarding Armor -11	Cr80000	36	28	3	12	3	6	1	3	9
11	CbtA-11	Combat Armor -11	Cr80000	60	28	12	12	12	12	4	12	12
11	(Lt) BA-11	Light Battle Armor -11	Cr110000	52	32	12	12	12	12	5	12	12
11	BA-11	Battle Armor -11	Cr100000	75	35	15	15	15	15	5	15	15
11	SU-11	Sapper Unit -11	Cr420000	240	20	12	12	2	12	1	16	16
11	DU-11	Drop Unit -11	Cr180000	600	32	2	16	2	16	1	2	16
11	(ImD) SS-11	Improved Disposable Sapper Suit -11	Cr3850	10	11	7	7	2	7	1	9	9
12	(A) HEA-12	Advanced Hostile Environ Armor -12	Cr320000	28	66	13	13	34	13	1	34	46
12	(AH) PA-12	Advanced Heavy Police Armor -12	Cr136000	18	39	23	35	23	23	1	23	26
12	(AltLt) ProU-12	Alternate Light Prospector Unit -12	Cr435600	308	10	6	4	4	4	4	8	12
12	(AltT) HazA-12	Alternate Titan Hazmat Armor -12	Cr5940000	1 tons	63	31	31	31	31	4	49	49
12	(AltVl) SA-12	Alternate Vlight Sapper Armor -12	Cr308000	23	35	18	18	3	18	4	24	24



Armor Examples

The following weapon examples demonstrate the output of the armor generation system.

Armor 7-3

TL	Model	LongName	Cost	kg	Ar	Ca	Fl	Ra	So	Ps	In	Se
12	(ELt) BD-12	Early Light Battle Dress -12	Cr264000	119	40	25	25	25	25	5	25	25
12	(EM) BD-12	Early Medium Battle Dress -12	Cr240000	170	43	28	28	28	28	5	28	28
12	(EOs) DD-12	Early Oversize Drop Dress -12	Cr1440000	1 tons	82	12	54	12	54	1	12	54
12	(EVl) DD-12	Early Vlight Drop Dress -12	Cr288000	122	65	0	41	0	41	1	0	41
12	(H) BdA-12	Heavy Boarding Armor -12	Cr160000	46	36	13	22	13	16	1	13	19
12	(Im) BA-12	Improved Battle Armor -12	Cr110000	75	41	21	21	21	21	5	21	21
12	(Im) ProU-12	Improved Prospector Unit -12	Cr396000	400	14	10	8	8	8	1	12	16
12	(ModS) DA-12	Modified Small Drop Armor -12	Cr36000	40	59	6	27	6	27	1	6	27
12	(P) AU-12	Prototype Assault Unit -12	Cr540000	570	4	0	0	0	0	2	0	0
12	(PVl) DD-12	Prototype Vlight Drop Dress -12	Cr720000	136	63	0	39	0	39	1	0	39
12	(StH) PD-12	Standard Heavy Police Dress -12	Cr136000	31	35	16	40	16	16	1	16	22
12	(StM) BdA-12	Standard Medium Boarding Armor -12	Cr80000	36	28	3	12	3	6	1	3	9
12	(StOs) PD-12	Standard Oversize Police Dress -12	Cr680000	192	39	14	38	14	14	1	14	20
12	(StT) CbtS-12	Standard Titan Combat Suit -12	Cr120000	540	24	12	12	12	12	4	12	12
12	(XS) AD-12	Experimental Small Assault Dress -12	Cr240000	60	10	4	4	4	4	2	4	4
12	(EnS) EnvU-12	Enhanced Small Environ Unit -12	Cr180000	100	19	11	11	5	11	1	43	23
12	(ModT) EnvS-12	Modified Titan Environ Suit -12	Cr54000	121	27	15	15	12	15	1	31	21
12	(P) BdD-12	Prototype Boarding Dress -12	Cr480000	91	32	2	20	2	8	1	2	14
12	(Os) BdA-12	Oversize Boarding Armor -12	Cr800000	288	40	11	20	11	14	1	11	17
12	DD-12	Drop Dress -12	Cr120000	120	72	6	48	6	48	1	6	48
12	(EnM) CU-12	Enhanced Medium Cold Unit -12	Cr48000	80	7	5	5	5	5	1	15	5
12	PrS-12	ProtectedSuit -12	Cr1000	3	4	1	1	2	1	1	3	4
12	BdU-12	Boarding Unit -12	Cr240000	240	16	2	8	2	4	1	2	6
12	AA-12	Assault Armor -12	Cr60000	45	14	6	6	6	6	2	6	6
12	CbtU-12	Combat Unit -12	Cr240000	400	16	8	8	8	8	4	8	8
13	(Alt) CbtU-13	Alternate Combat Unit -13	Cr264000	440	21	13	13	13	13	7	13	13
13	(AltH) SU-13	Alternate Heavy Sapper Unit -13	Cr924000	343	33	27	27	17	27	4	31	31
13	(AltLt) CbtU-13	Alternate Light Combat Unit -13	Cr290400	308	18	10	10	10	10	7	10	10
13	(AltOs) BA-13	Alternate Oversize Battle Armor -13	Cr1100000	660	52	28	28	28	28	8	28	28
13	(AT) SS-13	Advanced Titan Sapper Suit -13	Cr420000	259	36	24	24	19	24	1	26	26
13	(BLt) BD-13	Basic Light Battle Dress -13	Cr154000	91	37	22	22	22	22	5	22	22
13	(ED) DU-13	Early Disposable Drop Unit -13	Cr108000	918	25	0	9	0	9	1	0	9
13	(EM) AD-13	Early Medium Assault Dress -13	Cr144000	102	16	10	10	10	10	2	10	10
13	(ET) ProU-13	Early Titan Prospector Unit -13	Cr12960000	18 tons	22	10	8	8	8	1	12	16
13	(Im) DD-13	Improved Drop Dress -13	Cr132000	120	78	12	54	12	54	1	12	54
13	(ImH) BA-13	Improved Heavy Battle Armor -13	Cr220000	97	49	31	31	31	31	5	31	31
13	(ImOs) BA-13	Improved Oversize Battle Armor -13	Cr1100000	600	53	29	29	29	29	5	29	29
13	(ImVl) BA-13	Improved Vlight Battle Armor -13	Cr220000	45	36	16	16	16	16	5	16	16
13	(ModS) CbtA-13	Modified Small Combat Armor -13	Cr48000	27	31	15	15	15	15	4	15	15
13	(ModT) BS-13	Modified Titan Battle Suit -13	Cr180000	607	29	16	16	16	16	5	16	16
13	(PH) BdD-13	Prototype Heavy Boarding Dress -13	Cr960000	118	40	12	30	12	18	1	12	24
13	(StH) ProU-13	Standard Heavy Prospector Unit -13	Cr720000	520	16	14	12	12	12	1	16	20
13	(StS) CbtU-13	Standard Small Combat Unit -13	Cr120000	200	16	8	8	8	8	4	8	8
13	(StVl) CbtA-13	Standard Vlight Combat Armor -13	Cr160000	36	23	7	7	7	7	4	7	7
13	(T) PD-13	Titan Police Dress -13	Cr2040000	648	43	14	38	14	14	1	14	20
13	(T) WpnU-13	Titan < > Carrier Unit -13	Cr5400000	10 tons	48	10	10	10	10	1	10	10
13	(XT) DD-13	Experimental Titan Drop Dress -13	Cr14400000	6 tons	80	6	48	6	48	1	6	48
13	BD-13	Battle Dress -13	Cr200000	100	45	30	30	30	30	5	30	30
13	BdD-13	Boarding Dress -13	Cr160000	48	36	6	24	6	12	1	6	18
13	CbtD-13	Combat Dress -13	Cr160000	80	36	24	24	24	24	4	24	24
14	(AH) EnvA-14	Advanced Heavy Environ Armor -14	Cr120000	15	46	32	32	23	32	1	80	50
14	(AH) SA-14	Advanced Heavy Sapper Armor -14	Cr560000	37	53	38	38	23	38	1	44	44
14	(AltS) BD-14	Alternate Small Battle Dress -14	Cr110000	55	50	35	35	35	35	8	35	35
14	(AS) BA-14	Advanced Small Battle Armor -14	Cr100000	30	45	25	25	25	25	5	25	25
14	(AVl) EnvA-14	Advanced Vlight Environ Armor -14	Cr120000	7	33	17	17	8	17	1	65	35
14	(EnS) BD-14	Enhanced Small Battle Dress -14	Cr400000	100	48	33	33	33	33	5	33	33
14	(EnS) CbtD-14	Enhanced Small Combat Dress -14	Cr320000	80	39	27	27	27	27	4	27	27

Armor Examples

The following weapon examples demonstrate the output of the armor generation system.

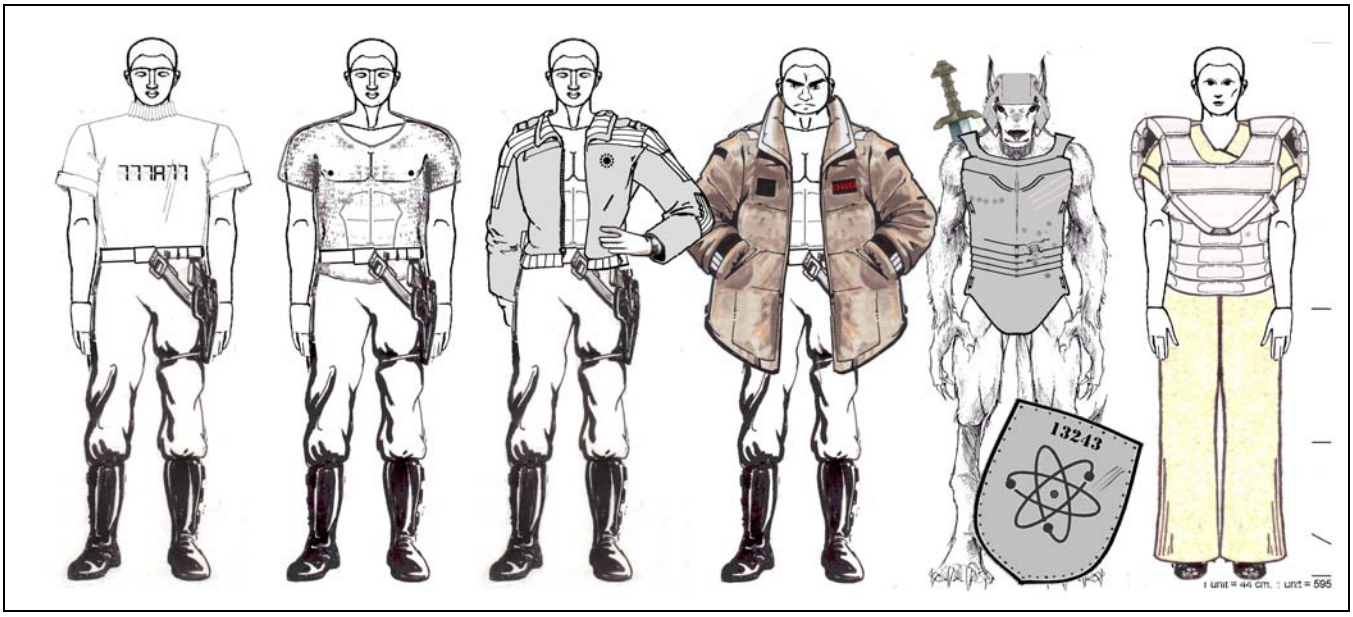
Armor 7-4

TL	Model	LongName	Cost	kg	Ar	Ca	Fl	Ra	So	Ps	In	Se
14	(EnT) SA-14	Enhanced Titan Sapper Armor -14	Cr16800000	1 tons	54	29	29	14	29	1	35	35
14	(ImM) BdD-14	Improved Medium Boarding Dress -14	Cr176000	48	42	12	30	12	18	1	12	24
14	(ModH) BA-14	Modified Heavy Battle Armor -14	Cr240000	87	46	28	28	28	28	5	28	28
14	(ModLt) CbtU-14	Modified Light Combat Unit -14	Cr316800	252	16	8	8	8	8	4	8	8
14	(Os) CbtD-14	Oversize Combat Dress -14	Cr1600000	640	48	32	32	32	32	4	32	32
14	(StD) HU-14	Standard Disposable Hot Unit -14	Cr18000	54	3	9	5	5	5	1	5	5
14	(StLt) CbtD-14	Standard Light Combat Dress -14	Cr176000	56	33	21	21	21	21	4	21	21
14	(StT) PD-14	Standard Titan Police Dress -14	Cr2040000	648	43	14	38	14	14	1	14	20
14	(ModS) CbtU-14	Modified Small Combat Unit -14	Cr144000	180	19	11	11	11	11	4	11	11
14	(ImH) BdU-14	Improved Heavy Boarding Unit -14	Cr528000	312	30	18	24	18	20	1	18	22
14	(EOs) AD-14	Early Oversize Assault Dress -14	Cr1440000	816	28	18	18	18	18	2	18	18
14	(BT) CU-14	Basic Titan Cold Unit -14	Cr252000	1 tons	15	5	5	5	5	1	15	5
14	(BM) AD-14	Basic Medium Assault Dress -14	Cr84000	78	13	7	7	7	7	2	7	7
14	(ObS) PD-14	Obsolete Small Police Dress -14	Cr17000	8	30	9	33	9	9	1	9	15
14	AD-14	Assault Dress -14	Cr120000	60	18	12	12	12	12	2	12	12
14	(S) AD-14	Small Assault Dress -14	Cr60000	30	18	12	12	12	12	2	12	12
15	(AH) BdA-15	Advanced Heavy Boarding Armor -15	Cr320000	37	46	23	32	23	26	1	23	29
15	(AM) AA-15	Advanced Medium Assault Armor -15	Cr120000	36	24	16	16	16	16	2	16	16
15	(AOs) BA-15	Advanced Oversize Battle Armor -15	Cr2000000	480	57	33	33	33	33	5	33	33
15	(AS) DD-15	Advanced Small Drop Dress -15	Cr120000	48	82	16	58	16	58	1	16	58
15	(ED) BD-15	Early Disposable Battle Dress -15	Cr120000	153	38	23	23	23	23	5	23	23
15	(EnVl) BdD-15	Enhanced Vlight Boarding Dress -15	Cr1280000	57	34	4	22	4	10	1	4	16
15	(ET) BD-15	Early Titan Battle Dress -15	Cr7200000	4 tons	59	36	36	36	36	5	36	36
15	(ImH) BD-15	Improved Heavy Battle Dress -15	Cr440000	130	59	46	46	46	46	5	46	46
15	(ModH) DD-15	Modified Heavy Drop Dress -15	Cr288000	140	83	19	61	19	61	1	19	61
15	(ModT) ExpU-15	Modified Titan Exploration Unit -15	Cr15120000	4 tons	39	13	13	13	21	1	27	27
15	(PT) BD-15	Prototype Titan Battle Dress -15	Cr18000000	5 tons	57	34	34	34	34	5	34	34
15	(StH) BD-15	Standard Heavy Battle Dress -15	Cr400000	130	53	40	40	40	40	5	40	40
15	(StH) BdD-15	Standard Heavy Boarding Dress -15	Cr320000	62	44	16	34	16	22	1	16	28
15	(AltH) AU-15	Alternate Heavy Assault Unit -15	Cr396000	429	21	19	19	19	19	5	19	19
15	(AM) PrS-15	Advanced Medium ProtectedSuit -15	Cr2000	2	14	11	11	12	11	1	13	14
15	PrA-15	ProtectedArmor -15	Cr20000	9	14	3	3	6	3	1	9	12
16	(AH) DD-16	Advanced Heavy Drop Dress -16	Cr480000	124	90	26	68	26	68	1	26	68
16	(AS) BD-16	Advanced Small Battle Dress -16	Cr200000	40	55	40	40	40	40	5	40	40
16	(ImD) BU-16	Improved Disposable Battle Unit -16	Cr165000	450	21	11	11	11	11	5	11	11
16	(ModLt) AD-16	Modified Light Assault Dress -16	Cr158400	37	18	12	12	12	12	2	12	12
16	(Ob) BU-16	Obsolete Battle Unit -16	Cr150000	350	23	13	13	13	13	5	13	13
16	(ObD) HazU-16	Obsolete Disposable Hazmat Unit -16	Cr135000	163	22	10	10	10	10	1	22	22
16	(StM) PrA-16	Standard Medium ProtectedArmor -16	Cr20000	9	14	3	3	6	3	1	9	12
16	(StD) DD-16	Standard Disposable Drop Dress -16	Cr60000	108	67	1	43	1	43	1	1	43
16	(ImD) DD-16	Improved Disposable Drop Dress -16	Cr66000	108	73	7	49	7	49	1	7	49
17	(AT) EnvU-17	Advanced Titan Environ Unit -17	Cr5400000	2 tons	42	26	26	20	26	1	58	38
17	(ModT) DD-17	Modified Titan Drop Dress -17	Cr4320000	2 tons	91	17	59	17	59	1	17	59
17	(ObH) DD-17	Obsolete Heavy Drop Dress -17	Cr120000	109	83	19	61	19	61	1	19	61
17	(StD) BD-17	Standard Disposable Battle Dress -17	Cr100000	90	40	25	25	25	25	5	25	25
18	(AH) AD-18	Advanced Heavy Assault Dress -18	Cr480000	62	36	32	32	32	32	2	32	32
18	(AltD) AD-18	Alternate Disposable Assault Dress -18	Cr66000	59	18	12	12	12	12	5	12	12
18	(D) PrA-18	Disposable ProtectedArmor -18	Cr10000	8	9	0	0	1	0	1	4	7
18	(ModT) CbtD-18	Modified Titan Combat Dress -18	Cr5760000	1 tons	55	35	35	35	35	4	35	35
18	(ObVl) CbtD-18	Obsolete Vlight Combat Dress -18	Cr160000	33	34	22	22	22	22	4	22	22
18	(T) PrA-18	Titan Protected Armor -18	Cr600000	243	30	11	11	14	11	1	17	20
19	(AT) CbtD-19	Advanced Titan Combat Dress -19	Cr9600000	1 tons	62	42	42	42	42	4	42	42
19	(ModD) AD-19	Modified Disposable Assault Dress -19	Cr72000	48	16	10	10	10	10	2	10	10
19	(ObT) PrS-19	Obsolete Titan ProtectedSuit -19	Cr15000	56	23	12	12	13	12	1	14	15
20	(ObH) PrA-20	Obsolete Heavy ProtectedArmor -20	Cr20000	8	25	16	16	19	16	1	22	25
20	(ObT) CbtD-20	Obsolete Titan Combat Dress -20	Cr2400000	1 tons	55	35	35	35	35	4	35	35

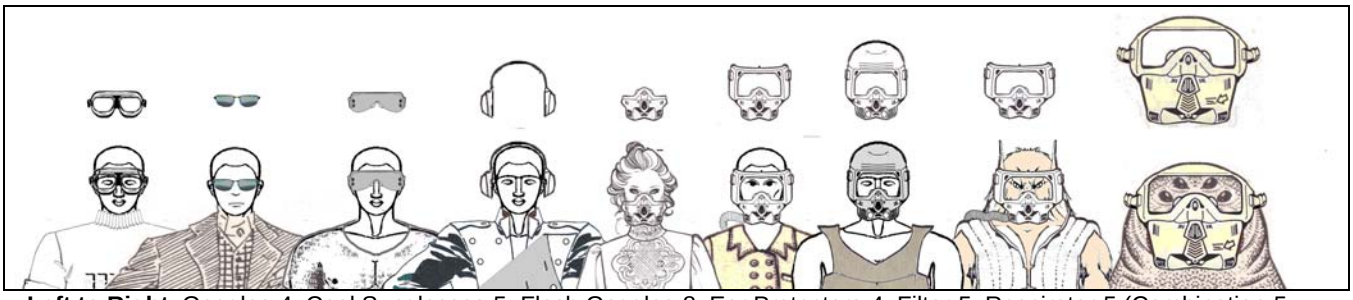
The Item Catalog

The following weapon examples demonstrate the output of the armor generation system.

Armor 9

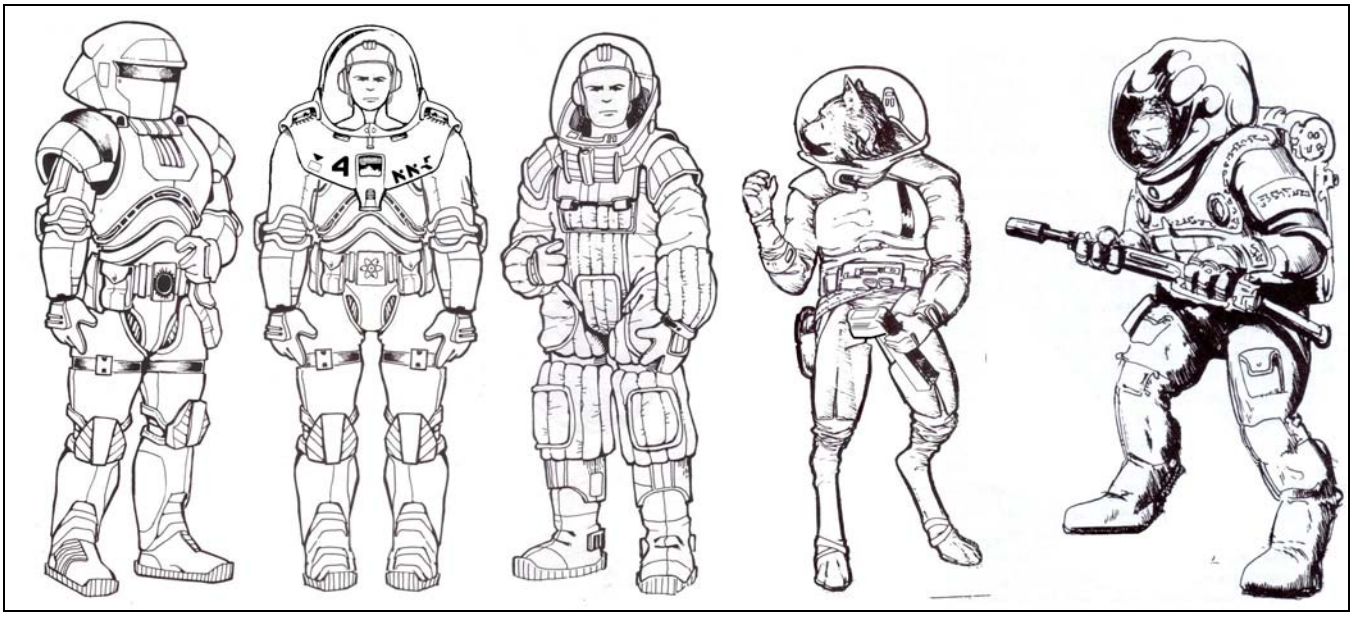


Left to Right. Unarmored. Mail. Jack. Heavy Coat. Plate (and Helmet and Shield). Ablat.

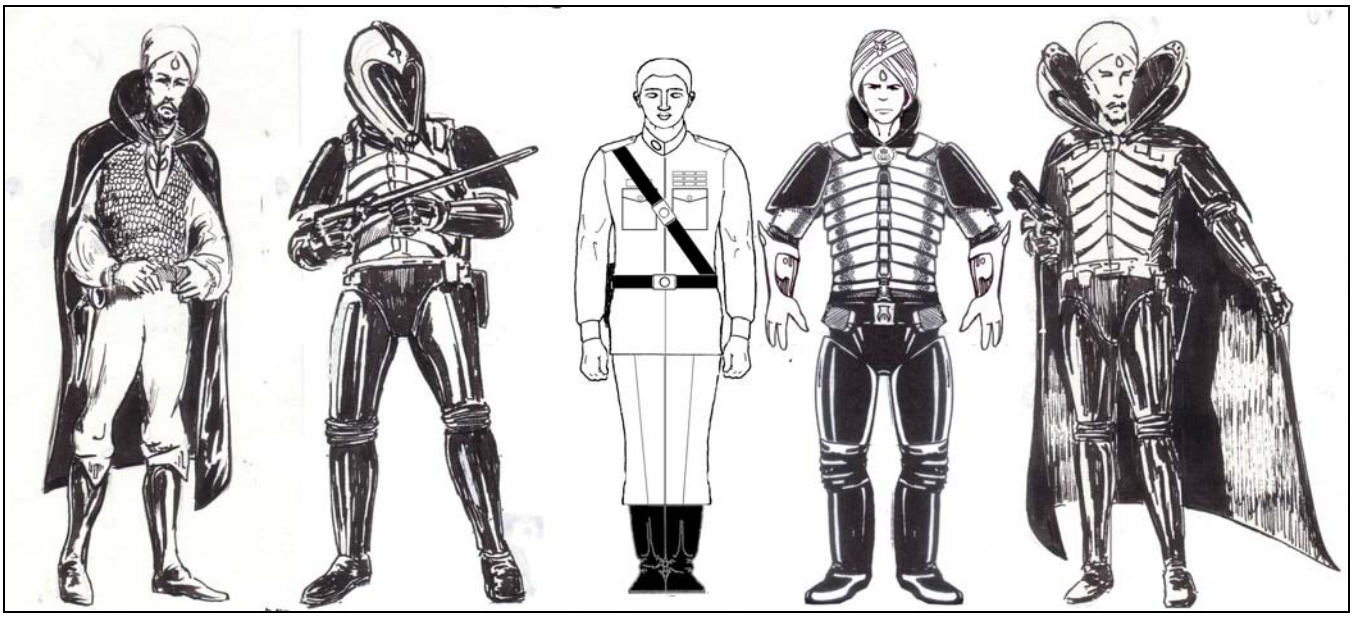


Left to Right. Goggles-4. Cool Sunglasses-5. Flash Goggles-8. Ear Protectors-4. Filter-5. Respirator-5 (Combination-5 looks the same). Gill-9. Respirator-5 (Aslan). Combination-5 (Plexxan).

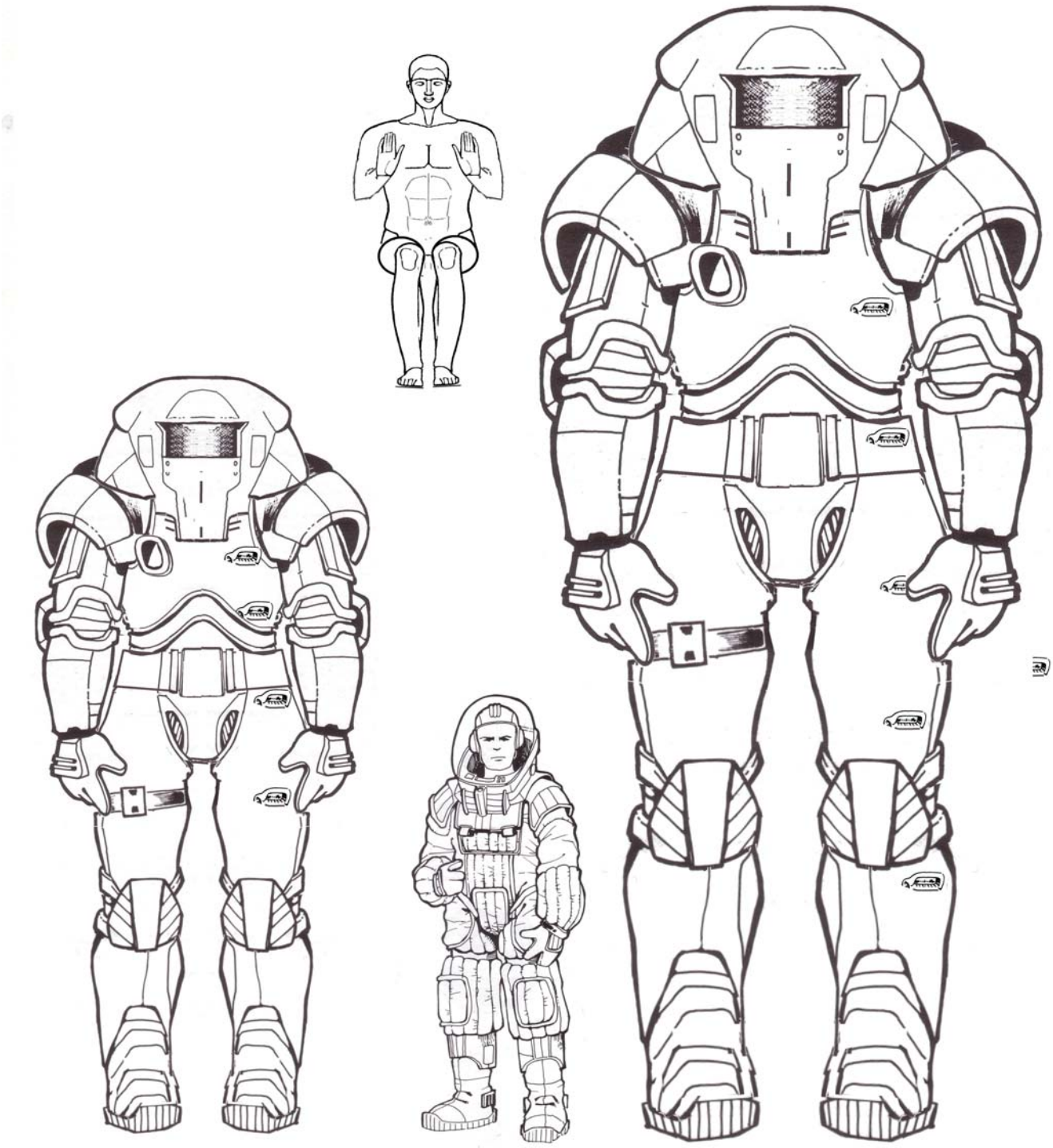
Left To Right. Beret. Full Helmet with Visor-8. Crew Helmet-9. Psionic Shield Helmet-12. Desert Scarf/ Shemagh-2. Military Helmet-4. Military Helmet-4 (Vargr). Desert Cloak. Respirator-5 (K'kree).



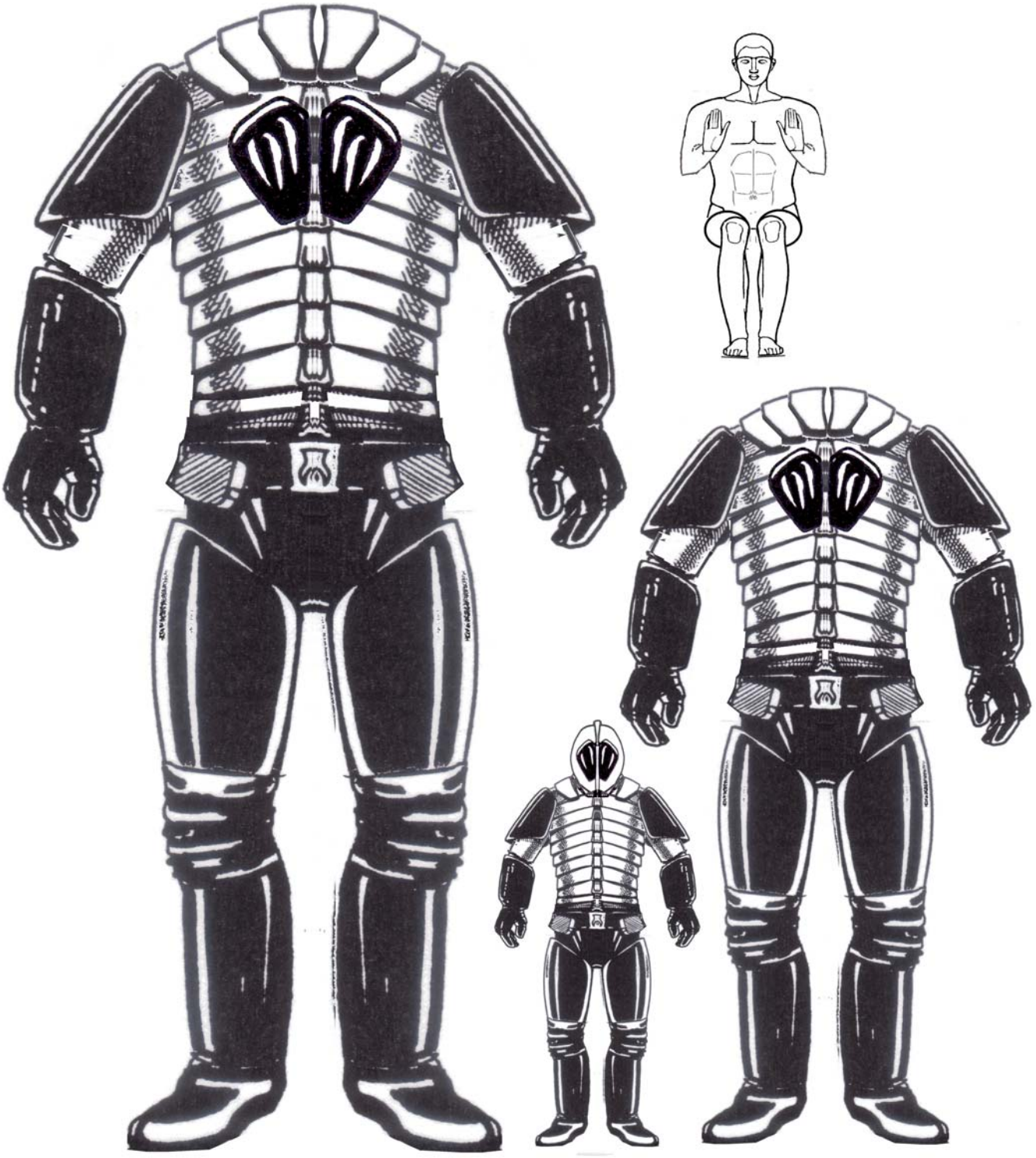
Left to Right. Battle Dress-13. Heavy Hostile Environ Armor-10. Vacc Suit-9. Improved Vacc Suit-10 (Vargr). Combat Armor-11 (Aslan).



Left to Right. Zhodani Noble. Combat Armor-11 (Zhodani with characteristic Clamshell Helmet). Zhodani Intendant. Combat Dress-13 (Zhodani; no helmet). Battle Armor-11 (Zhdodani with characteristic Clamshell Helmet and Ablat Cape).



Left to Right. Oversize Battle Dress-13. Vacc Suit-9. Titan Battle Dress-13.



Left to Right.

	Armor Model
	Model LongName
	The basic information required to describe armor.

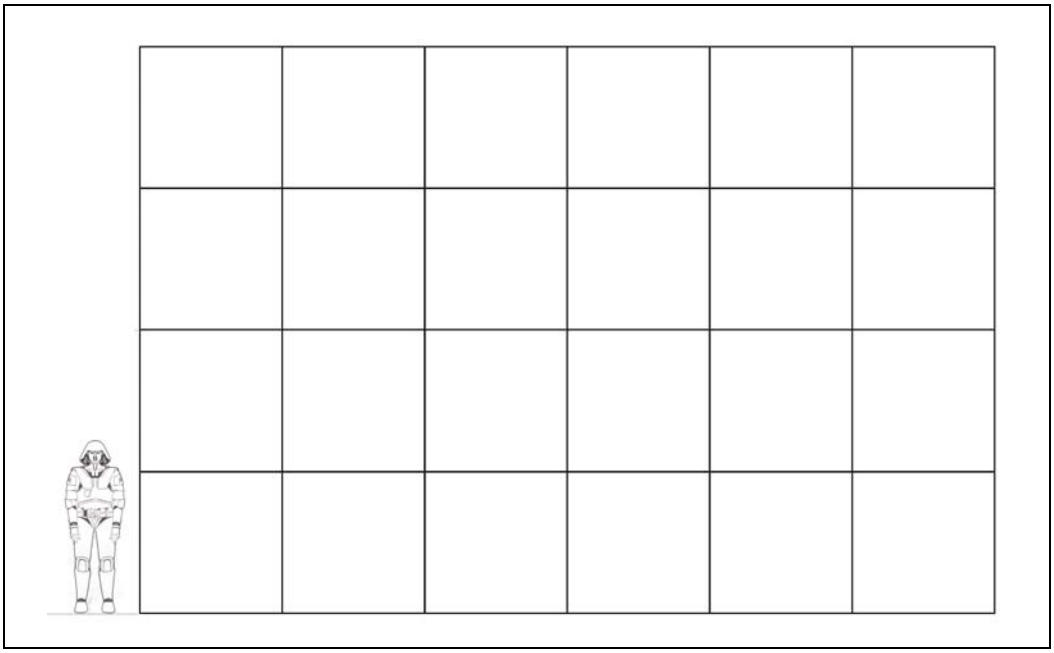
Ax: ARMOR EXTENSION

	Cost	Mass	QREBS	Ar=	Ca=	Fl=	Ra=	So=	Ps=	In=	Se=
Ax:	KCr=	kg	B=	Ar=	Ca=	Fl=	Ra=	So=	Ps=	In=	Se=

The basic information required to use armor.

HIT LOCATIONS

Comms	**2**
Cargo	**3**
Sensors	**4**
Protections	**5**
Life Support	**6**
Body Panel	**7**
Power Source	**8**
Locomotion	**9**
Weaponry	**10**
Navigation	**11**
Software	**12**



Paste any **Traveller** armor image here. Include a human figure for scale.

ARMOR / PROTECTION

Armor	
Cage	
FlashProof	
RadProof	
SoundProof	
PsiShield	
Insulated	
Sealed	

CHARACTERISTICS

C1		
C2		
C3		

Vehicles

Vehicles are essential tools for **Travellers**: they extend the ability of characters to move to other locations with both ease and relative safety.

The term vehicle is used for any independent device that can move passengers or freight from one location to another. Although starships and spacecraft are technically within this definition, they are handled separately.

UNDERSTANDING VEHICLES

Vehicles are a basic component of any technological society.

Each specific vehicle has a Longname which describes its function, and a Model which abbreviates the LongName.

With an understanding of Vehicles and Terrain (and Weapons, Armor, and Combat), players can generally make use of any available Vehicles.

Types of Vehicles

Vehicles are available in five basic types, each with its own importance and governing rules:

Ground Vehicles are civilian passenger and cargo ground transport. They include road and offroad vehicles, and wide-ranging exploratory vehicles.

Military Vehicles are troop and weapon ground transport. They are intended for use on the battlefield, and include armored fighting vehicles and tanks.

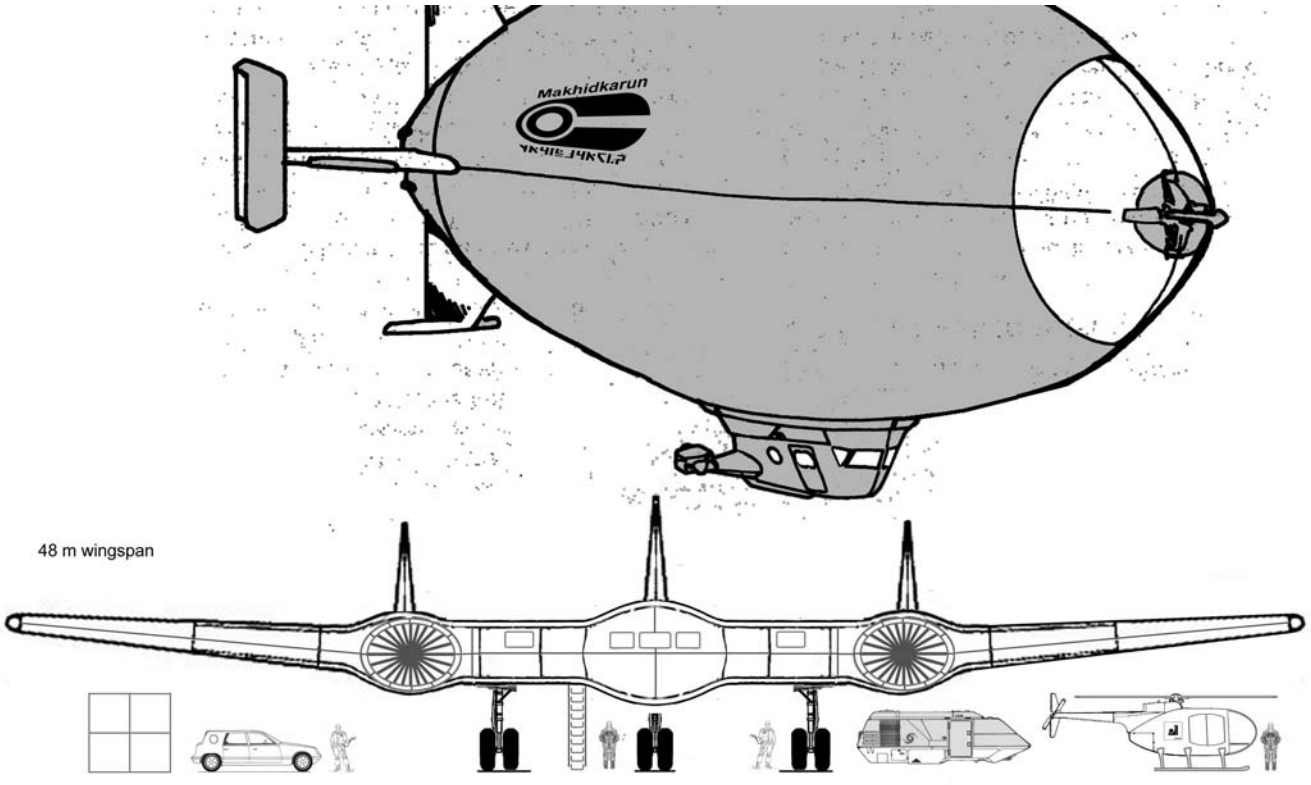
Flyers travel above world surfaces, generally in atmospheres and unimpeded by terrain. They include both civil and military vehicles.

Watercraft travel on and under oceans or bodies of water. They include surface craft and submersibles.

Small Craft travel out of atmosphere (or from world surface to beyond atmosphere). They may be civil or military,

Grav and Lifter Vehicles

Some vehicles within each of these types are based on Grav or Lifter technology. They are classified according to their primary use: Ground, Military, Flyer, or Watercraft.



Left to Right. Cargo Pod (shown end on = 3 meters wide by 3 meters high). Wheeled GroundCar-4. GCarrier-10. Helicopter-9. Transport Aircraft-8. Blimp-9.

VEHICLE DESCRIPTION

Model	LongName (Bulk - Motive - Mission - Type -User - TL)
VhWCF	Vheavy Winged Cargo Flyer-15

The basic information required to describe a vehicle.

Vx: VEHICLE EXTENSION

	Tons	Speed	Load	Stage	Environ	Endurance	QREBS	Options
Vx:	Tons=122	Speed=10	Load=16	Adv	Sealed	Continental		

The basic information required to use a weapon.

DESCRIBING VEHICLES

Vehicles can be described in many ways depending on the format and information required: any format which presents the required information is acceptable.

The Vehicle Description

Vehicles are described in a series of elements to form the LongName or abbreviated to form the Model. The LongName or Model contains enough information to allow a character to describe a Vehicle.

Elements of a LongName not necessary for a proper understanding may be omitted. The LongName consists of the following elements:

Bulk - Motive - Mission - Type - User - TL

Type identifies the basic function of the Vehicle. For example, Truck.
Mission elaborates on the activity the Vehicle is designed for. For example, Cargo or Explorer.
Motive details the Vehicles transport mechanism. For example, Wheeled, or Tracked.
Bulk describes the vehicles relative weight, mass, or bulk of the weapon. For example, Vlight, Light, Heavy, or Vheavy.
User identifies the intended or designed user. Blank assumes the user is Human or Man. For example, Man or Hiver.
Tech Level identifies the Technological Level at which the Weapon is commonly manufactured. TL is required.

Model. LongName elements have abbreviations which are used to create the Vehicle Model.

Model is a jargon-abbreviated Longname. Once a character is familiar with a specific Vehicle, references to it devolve to its abbreviation. Given the restrictions of the alphabet, element abbreviations are not necessarily unique.

The Vehicle Extension

The capabilities of a Vehicle are contained in the Vehicle Extension: a string of values detailed enough to allow a character to use a Vehicle. The Vehicle Extension is a variable length string: only required information should be included.

The Prefix. The Vehicle extension begins with the prefix Vx:

The Elements. Following the prefix, the Vehicle Extension includes

Vx: Tons - Speed - Load - Stage - Environ - Endurance - QREBS - Options

Tons is calculated Volume Tonnage.
Speed is calculated Speed of the Vehicle.
Load is calculated cargo or transport space for the Vehicle in tons.
Stage is the Vehicle's position in the spectrum of sophistication in the developmental life cycle.
Environ is the Vehicle's structural protection against hostile environments.
Endurance is the Vehicle's duration of operation before refueling or maintenance.
QREBS is the Vehicle's values on the QREBS scale.
Options is a statement of installed options for the Vehicle.

The Armor Extension

Most vehicles have some form of Armor. The Armor values for the Vehicle are shown with an Armor Extension. Because the Armor is integral to the Vehicle, note that values for Cost, Mass, and QREBS are not required.

Ax: ARMOR EXTENSION

	Cost	Mass	QREBS	Ar=	Ca=	Fl=	Ra=	So=	Ps=	In=	Se=
Ax:				Ar=43	Ca=04	Fl=26	Ra=40	So=24	Ps=00	In=90	Se=60

The basic information required to use armor.

USING VEHICLES

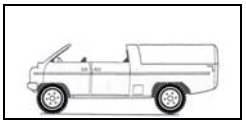
Vehicles transport passengers and cargo between locations.

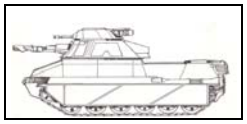
Vehicle operation is governed by skills and knowledges. Vehicle movement is constrained by terrain (including roads) for surface vehicles and watercraft, and by atmosphere for flyers. Vehicles can be damaged or destroyed by natural events, or by attacks.

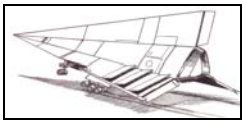
The **Vehicle Operations Chart** details the tasks associated with vehicle operations.

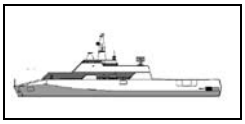
The **Traveller Vehicle System** creates five distinct Types of Vehicles: Ground Vehicles, Military Vehicles, Flyers, Watercraft, and Small or Space Craft. Each has its own distinct uses and advantages; each has its own specific restrictions and shortcomings.

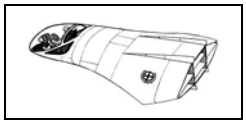
THE TYPES OF VEHICLES


Ground


Military


Flyer


Water


Small Craft

CREATING VEHICLES

Vehicles can be designed and created (randomly or with purpose) using the Vehicle Design Tables.

The Vehicle Charts. Each Vehicle (one for each Type of Vehicle) provides the basic information about possible Vehicles, their Mission or Use, and their Motive Power. Selecting the details from the Chart produces a basic or common version of the Vehicle.

The Options. The Options Chart provides additional features for Vehicles to customize them for specific uses.

The Fill Form. The Vehicle Fillform provides a standardized process for creating Vehicles. The final information it produces documents the capabilities and costs of the vehicle.

The Combat Chart. The Combat Chart provides a ready reference for the Vehicle and is supports use of the vehicle in combat or adverse situations.

VEHICLE TYPES

Vehicle type is a descriptive term identifying function.

Civil Vehicles

Civil vehicles are used in ordinary society for personal, commercial, and recreational purposes.

Car. A basic vehicle for transporting people and a small quantity of luggage.

Van. A utility vehicle with enclosed passenger space for 2-6 occupants and an enclosed cargo bed.

Truck. A basic vehicle for transporting cargo.

Mover. A vehicle design to pull cargo or passengers modules, but with no cargo capacity of its own..

Transport. A cargo vehicle generally larger or more powerful than a truck.

Vehicle. A means of transport not otherwise defined.

Military Vehicle Types

Military vehicles are specialized vehicles used by armed forces in their operations.

Tank. A military vehicle capable of powerful attacks, strong defense, and rapid movement over a variety of terrain types.

A Tank carries a turret or vehicle-mount weapon, strong or extensive armor and protections.

Carrier. An armored fighting vehicle with an available cargo space which can be used for a variety of purposes.

A Carrier features strong or extensive armor and protections. It is essentially a tank-like vehicle which replaces the tank's turret or vehicle-mount weapon with an available cargo (or other function) space.

Vehicle. A military fighting vehicle which does not qualify for the Tank or Carrier designation.

Watercraft Types

Watercraft may be based on four distinct types of locomotion.

Ship. The vehicle moves floating on water.

Sail. The vehicle moves on water and powered by wind.

Sub. The vehicle moves fully submerged within water.

Grav. The vehicle moves using the Gravitic Drive (G-Drive). Grav Watercraft operate near water surfaces and are governed by Watercraft skill.

Flyer Types

Flyers are available in six types:

Wings. Winged craft include airplanes and lifting bodies; they are the most common type of Flyers. Wings provide lift and allow aircraft to move efficiently in atmosphere.

Add-On Wings. Other Flyer types may have Add-On Wings; despite this addition, the Flyer retains its non-Wing character.

Rotorcraft. Rotorcraft include helicopters (and a variety of esoteric systems of no practical value: autogyros, gyrodynes). Rotors provide lift for aircraft and allow vertical takeoff and landing. The typical rotorcraft is a helicopter.

Flappers. Flappers are moving wings in imitation of bird wings. They provide lift through wing motion.

LTA. Lighter Than Atmosphere Craft use buoyant gases to provide lift.

Liftcraft. Aircraft with lifters create a cancelled or counteracted gravity effect which lifts them above a world surface.

Lifters do not require atmosphere.

Lifters provide very small horizontal or vectored thrust. Additional thrust is provided through the High Powered Option.

Grav. Grav vehicles use a Gravitic or G-Drive to provide lift. G-Drives are more powerful than Lifters and provide greater horizontal thrust.

MISSION

Mission is the differentiating descriptor for some Vehicles.

Ground Vehicles

Passenger. The vehicle carries passengers.

Cargo. The vehicle carries cargoes or freight.

Utility. The vehicle is capable of carrying passengers or cargo or both. It is designed for a wide range of work assignments.

Explorer. The vehicle is designed for exploratory duties.

Watercraft

Watercraft missions include:

Cargo. The vehicle carries cargoes or freight.

Patrol. The vehicle is designed for security or recon missions.

Explorer. The vehicle is designed for exploration.

Transport. The vehicle is designed to carry freight or cargo, especially bulky or oversized objects.

Military

Military Vehicle missions include:

Weapon. The vehicle is designed to carry a large Weapon.

Troop. The vehicle is designed to carry troops on the battlefield.

Supply. The vehicle is designed to transport goods and supplies on the battlefield.

Recon. The vehicle is designed for recon or security duties.

Flyers

Flyer missions include:

Attack (or Combat). A flyer designed for offensive military missions.

Bomber. A flyer designed to carry destructive power to targets.

Cargo. A flyer designed to carry freight or cargo.

Protector. A flyer designed for defensive military missions.

Scientific. A flyer designed for research or exploration.

Flyer. A flyer not otherwise defined.

MOTIVE

The foundation of vehicles is their system of locomotion. Locomotion types differ between ground vehicles, flyers, and watercraft.

Ground Vehicle Locomotion

Ground vehicles may be based on a variety of motive systems.

Wheeled. The vehicle moves on wheels.

Tracked. The vehicle moves on endless tracks.

Air Cushion. The vehicle moves on a bed of high pressure atmospheric gases.

Legged. The vehicle moves on articulated legs. Legged vehicles are Units created using the Armor rules.

Mole. The vehicle is equipped to burrow under a world surface. A Mole is equipped with Tracks.

Lifters. The vehicle moves on anti-gravity lifter plates. Lift Ground Vehicles operate close to the surface and are governed by Driver skill.

Grav. The vehicle moves using the Gravitic or G-Drive. Grav Ground Vehicles operate close to the surface and are governed by Driver skill.

Flyer Locomotion

Flyers may be based on five distinct locomotion types.

Winged. The flyer moves using lift generating by wings (or lifting body surfaces). An airplane is a winged flyer.

Rotor. The flyer moves using a rotary wing which generates lift. A helicopter is a rotary wing flyer.

Flapper. The flyer moves using flapping wings which generate lift. An ornithopter is a flapping wing flyer.

LTA Lighter Than Atmosphere. The flyer is constructed to be less dense than surrounding atmosphere. A blimp or dirigible is an LTA flyer.

Lifters. The vehicle moves on anti-gravity lifter plates. Lift Flyers operate at higher levels of the atmosphere and are governed by Flyer skill.

Grav. The vehicle moves using the Gravitic or G-Drive. Grav Flyers operate at higher levels of the atmosphere and are governed by Flyer skill.

Watercraft Locomotion

Watercraft do not add Motive to their Type.

Small Craft

Small craft are spacecraft powered by Gravitic Drives (G-Drives).

BULK

Vehicles may be identified by their bulk or relative size.

Vlight. The vehicle is small and light. Its performance and capabilities are at the low end of those available.

Light. The vehicle is smaller than standard.

Medium (or Blank). The vehicle size and capabilities are typical.

Heavy. The vehicle is built to carry larger than normal loads.

VHeavy. The vehicle is large and massive. Its capabilities are at the upper limits for this type of vehicle.

ENVIRONMENT

Vehicles are manufactured to cope with local environment.

Air. The vehicle depends on local air for ventilation and breathing gases. The vehicle provides environmental controls for heating and cooling. Interior Air equal Atm for the world. For example, if Atm= 4 Thin Tainted, then the air in the interior of the vehicle is also 4 Thin Tainted.

Air-N. The vehicle processes local atmosphere to produce Air-N. An Air-6 Standard vehicle on an Atm=4 world processes the local Atm=4 Thin Tainted to remove (filter) the Taint and compress it from Thin to Standard.

Enclosed. The vehicle is enclosed to protect against the elements: wind, rain, snow, and weather.

Sealed. The vehicle is Sealed against exterior air pressure. Internal Air can be programmed to any of the Atm levels (from 3 Thin to 9 Dense). For those sophonts who require it, Taint of common types can be added.

Sealed is a Protection; the standard level provided is =20.

Double Sealed. In addition to Sealed, the vehicle includes an Air Lock which enables occupants to enter or leave the vehicle without losing air pressure or exposing those inside to outside environment.

Protected. The vehicle has Protections against most environmental threats. Minimum Armor=12, Sealed =20. Insulated=18.

Insulated. Most vehicles with an enclosed passenger space are Insulated = 12.

STAGE

Stage is the spectrum of effects based on the technological product development cycle.

Standard or (blank). The vehicle has no modifications or effects based on Stage.

Fossil. The vehicle is powered by (more-or-less) readily available fossil fuels or petrochemicals.

Renewables. The vehicle is powered by renewable fuels. The most common renewable fuel is organically produced alcohol.

PowerCell. The vehicle is powered by electric storage batteries.

Advanced. The vehicle is significantly better than the standard version, and features additional features and efficiencies. The vehicle is powered by a Fusion Module.

Early. The vehicle is a preliminary design with the bugs not yet worked out. The vehicle is powered by a Fusion Module.

Improved. The vehicle features small improvements. The vehicle is powered by a Fusion Module.

Alternate. The vehicle uses an alternate technology for some or all of its functions. The vehicle is powered by a Fusion Module.

ENDURANCE TYPES

Vehicles are classified by the territory they cover. Endurance is calculated last in the design sequence.

Endurance

Vehicle Endurance is the time that a vehicle can operate before it needs refueling, resupply, or maintenance. For most vehicles, Endurance is measured in hours: the vehicle does not accommodate sleeping, meals, or general living.

Endurance is selected as a component of Vehicle Design.

Hours. The Vehicle can operate for Hours (varies from 1 to 24) but less than a Day.

Days. The Vehicle can operate for Days (varies from 1 to 7) but less than a Week.

Weeks. The Vehicle can operate for Weeks (varies from 1 to 4) but less than a Month.

Months. The Vehicle can operate for Months (varies from 1 to 12) but less than a Year.

Years. The Vehicle can operate for Years (varies from 1 to 3).

Range

Range is the expected distance that a Vehicle can travel based on its Endurance and its Speed.

The Endurance to Range Table converts Vehicle Endurance to Range.

Local. The vehicle can travel in and around a specific location and within a Terrain Hex. A car used for city driving or a delivery truck are Local. Such vehicles occasionally venture into adjacent Terrain Hexes.

Regional. The vehicle can travel within a Region (a World Hex). Many Cargo Trucks or Truck Trains are Regional. Such vehicles occasionally venture into adjacent World Hexes.

Continental. The vehicle can travel within a Continent (a World Triangle).

World. The vehicle ican travel anywhere on the World.

A territory classification assumes the vehicle will venture occasionally into neighboring territories. For example, a Regional vehicle will sometimes or even often visit adjacent regions.

THE CALCULATED VALUES

During the Vehicle Creation process produces three calculated values: Tons, Speed, and Load.

Tons is the tonnage of the vehicle. This value is an approximate measure.

Speed is the Vehicle Speed Value. Its equivalent in Kph is provided by the Base Vehicle Speed Table.

Load is the available payload capacity of the vehicle.

QREBS

Any acquired vehicle is ordinarily assumed to be QREBS=00000 (no effects under QREBS system).

If the Vehicle Design System imposes any QREBS elements (for example, B= -2), that imposed element applies to the Vehicle.

As Issued. A Vehicle with only the imposed QREBS elements is considered **As Issued**. It is typical of the Vehicle as used. Most Vehicles are in this state, and any reasonable character can research and determine this information.

Used. Any character may ask for a **Used** Vehicle instead. The Referee then evaluates the weapon under QREBS and records this information.

THE CARGO MODULE

Commercial vehicles are built around the Cargo Module, a standardized container for goods.

VEHICLE FITTINGS

Vehicle Fittings are its controls and communications installations.

Controls

Vehicles are controlled by an operator through an established set of controls.

Manual. A system of controls (hand, manipulator, foot, head-movement, voice, and other) operate the unit. Manual controls are present on Vlite and Lite vehicles.

Powered Controls. A system of controls (hand, manipulator, foot, head-movement, voice, and other) operate the unit, assisted by power boosts and other enhancements. Power controls are the equivalent of Power Steering and Power Brakes (or Fly-By-Wire).

Power Controls are present on Medium, Heavy, and Vheavy vehicles (and are an option on Lite Vehicles).

.**AutoPilot Option.** Powered systems can be equipped with the AutoPilot option. The operator enters a destination and the system self-operates while the user sleeps or attends other functions. AutoPilot is distinct from Grid: AutoPilot is self-contained on the vehicle; Grid is a centralized traffic control system.

Requires Power Controls.

Grid Connection. Any vehicle at TL All vehicles include at least rudimentary manual controls.

Requires Power Controls and Grid Controller Channel.

Wafer. The user is directly connected to the operating controls via his wafer jack. Operation is transparent to the user.

Requires Power Controls and Vehicle TL 11+.

Communications

Vehicles may be fitted with a communications system.

Entertainment Channel. Reception of entertainment broadcasting.

Grid Controller Channel. Communication with the Central Traffic Control Grid (required on Hi Pop worlds). Connects the vehicle controls to the central Traffic Grid.

Net. Provides individual access to the local communications network. Operates within Range=6 of a commercial communications center/tower. Charges may apply.

Standard. Open channel radio broadcast system to Range=5.

LOS. Direct Line-Of-Sight (Laser or similar) system. Secure against eavesdropping. Self-directed (user direction not required). R=6.

LR LOS. Direct Long Range Line of Sight (Laser or similar) system for communication. R= 10.

Battlefield (Military Vehicles). Provides radio voice and data contact to Range= 6, with subchannels for individual communications.

Command (Military Vehicles). Enhanced Battlefield system to Range=8. Typically installed in Officer's systems for communications with higher levels.

Relay Option (Military Vehicles). Automatic capability to receive and retransmit Battlefield or LOS to the intended recipient.

Flyer Options

A variety of options are available for Flyers.

High Powered. The Flyer has greater than standard performance based on improved engines or thrusters.

Slave. The Flyer is intelligently piloted by computer. It flies in formation with the Master aircraft and reproduces its maneuvers and operations.

Remote. The Flyer is remotely operated by a pilot or operator on the ground or on another aircraft.

VTOL Mod. The Flyer (usually Winged) is modified to allow Vertical Takeoff and Landing. The Flyer can use any Landing Ground.

STOL. The Flyer (usually Winged) is modified to enable it to use shorter runways. The Flyer can use an Airport one size smaller than that normally required. Available on Heavy or smaller Flyers.

Wilderness Kit. The Flyer (usually Winged) is adapted to landing on open flat ground and does not require a runway. This kit includes STOL capability. Available on Heavy or smaller Flyers.

Weapon Mount. The Flyer is fitted with a weapons mount.

Floats. The Flyer has flotation landing gear allowing landing on water.

Hybrid VTOL. The Hybrid Vertical Take-Off and Landing option allows a winged aircraft to eliminate the need for an Airport by installing additional mechanisms (vectored thrust jets, tilt-rotors, lifters, or G-drives).

Add-On Wings. Some non-winged aircraft may add Wings to provide greater lift.

Floats. Aircraft may have seaplane landing floats to allow landing on bodies of water.

Parasite Nipple. Provision for an in-flight connection by a flyer to a larger Mother Flyer in flight.

On-Board Brain

A Vehicle with Power Controls and TL 11+ may be equipped with an On-Board Brain. The installation transforms the vehicle into a Strangeform Robot capable of self-directed movement.
on.

The Vehicle's Hobby. PB and SOCB require a Hobby (an outside interest) to maintain sanity. Select the Hobby from the Citizen Life Table.

Beginning and Final Intelligence. Brains are purchased based on their tested C4 Int as they leave the factory. Actual C4 Int gradually settles in over the course of the first year.

At the one-year anniversary of the brain construction, apply Flux to each D.

PASSENGERS AND CREW

The number of persons a Vehicle can carry is determined by a variety of factors.

A Vlite can carry one operator.

A Lite can carry two operators.

Standard or larger can carry operators and passengers equal to tonnage.

But,

A Tank has a crew equal to its tonnage divided by 2.

Supply vehicles can carry passengers equal to five times cargo capacity.

Non-Human Passengers. If a passenger is substantially larger than a human, adjust capacity on the basis of one per two humans or one per three humans.

THE VEHICLE CHARTS

Vehicles travel on world surfaces and their activity is constrained by terrain.

The **Vehicle Operators Chart** details how drivers, flyers, and seafarers actually operate their veicles.

The **Vehicle Chart Altitudes** shows the available altitudes at which flyers and grav vehicles may operate.

The **Vehicle Chart Depths** shows the depths of oceans and lakes and the expected pressures at depths.

The **Vehicle Chart Terrain** shows the types of terrain vehicles may encounter and the limits which terrain imposes.

The **Vehicle Chart Beastpower** shows the relative values of Beastpower (a more universal form of Horsepower) for the comparison of vehicle performance.

The **Vehicle Chart Design Box allows** an estimate of the tonnage of a vehicle from its dimensions or from a drawing.

FLYER RANGE BAND MOVEMENT

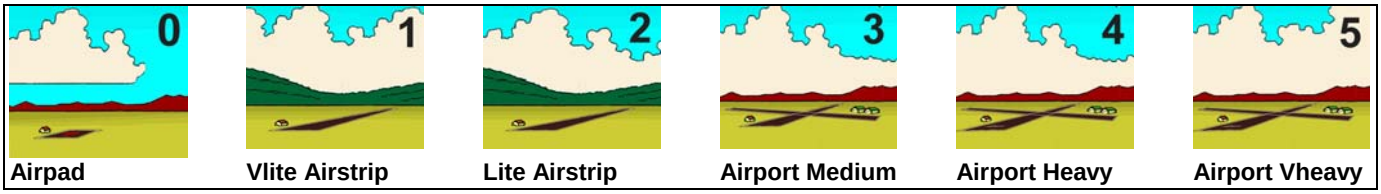
Flyers can move one surface Range Band per Round.

The actual Range to a Flyer with Altitude and Range is the greater of the two: a Flyer at Vlong Range R=5 and Altitude= NOP = 2 is at Range=5 for combat purposes.

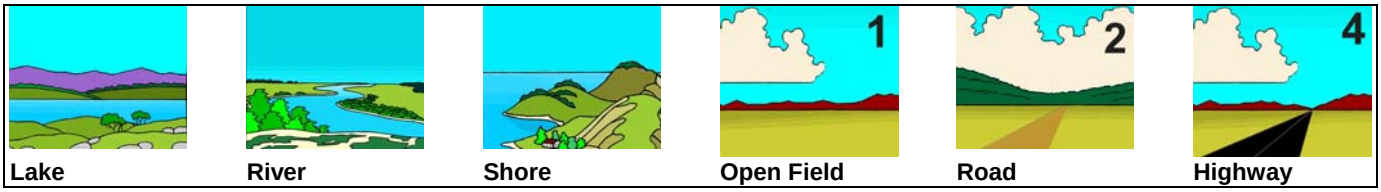
Flyers may maintain Range unchanged (the equivalent of Hover or Circling).

Flyers move at their designed Speed unless a deliberate change is made. A Winged Flyer must maintain a minimum Speed = 6 to remain airborne.

LANDING GROUNDS



ALTERNATIVE LANDING GROUNDS



LANDING GROUNDS

Size	Type	Length	Facilities	Which Flyers?	Where?
0	Airpad	50 m	Fuel	Non Wing. Non LTA.	City. Suburb. Town. Archology. Starport.
1	Vlite Airstrip	1000 m	None	Vlite Winged	
2	Light Airstrip	2000 m	Sparse	Light Winged	Town.
3	Medium Airport	3000 m	Standard	Standard Winged	Suburb.
4	Heavy Airport	4000 m	Very Good	Heavy Winged	Archology.
5	Vheavy Airport	5000 m	Excellent	All Flyers	City
1	Open Field	200 m	None	Non-Winged	Clear Single Hex
2	Road	2000 m	None		
4	Highway	4000 m	None		
	Lake				
	River				
	Shore				

Most flyers require a specified or dedicated landing ground.

A Landing Ground can accept any Flyer equal or less than it s Bulk (a Standard Landing Ground can accept Standard, Light, or Vlite flyers).

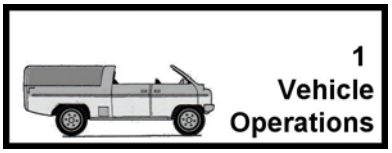
A Flyer with Floats can land on Lake, River, or calm Ocean.

What is the proper role for aircraft?

When compared to anti-gravity technology, aircraft are always cheaper. Anti-gravity can be imported to low tech worlds, but it becomes extremely expensive, considering that they cannot be repaired locally, and even skilled technicians must be imported to maintain them.

Vehicles Operations

Vehicles operations (Driver, Flyer, Seafarer) are very similar, using skills and characteristics in much the same way, regardless of the environment.



TASKS FOR VEHICLE OPERATIONS

Vehicle operation is governed by Characteristics, Skills, and Knowledges. Vehicles may be operated by characters, by the Grid, or by an On-Board Brain.

VEHICLE SKILLS AND KNOWLEDGES

Skill	Knowledge
Driver	Wheeled
Driver	Tracked
Driver	Legged
Driver	ACV
Driver	Grav
Driver	Mole
Flyer	Winged
Flyer	Rotor
Flyer	Flapper
Flyer	Grav
Flyer	LTA
Seafarer	Ship
Seafarer	Sub
Seafarer	Boat
Seafarer	Grav
Pilot	Small Craft
Pilot	ACS
Pilot	BCS

THE GRID

Vehicles operating on the Grid are under centralized Grid Computer control. Operations are automatic.

Centralized controls allow all vehicles to operate at optimum speed in the same traffic flow.

VEHICLE OPERATION TASKS

Vehicle Operation is based on a standard set of tasks.

Routine Vehicle Operations present little danger or difficulty; the vehicle is operating within its design parameters.

Routine Operations are resolved per World Hex; they are automatic if C+S for the Operator is 12 or greater.

Special Operations (marked with an asterisk *) are resolved per Terrain Hex (or per Local Hex if operating at that level).

Terrain

Terrain marked Yes on the Terrain Chart is **Allowed Terrain:** operations are routine.

Terrain marked No on the Terrain Chart is **Prohibited Terrain:** a vehicle cannot enter that terrain.

Terrain not marked Yes or No is **Disallowed Terrain**: vehicle operation is possible but more difficult.

Vehicle Operations Failure

Failure of a Vehicle Operation Task generates an **Emergency**: roll 1D for level.

Emergency-1	Easy 1D	C2
Emergency-2	Average2D	C2
Emergency-3	Difficult 3D	C2
Emergency-4	Formidable 4D	C2
Emergency-5	Staggering 5D	C2
Emergency-6	Hopeless 6D	C2

Vehicle Emergency Failure generates a Malfunction: roll 1D for level and consult Malfunctions.

BUT:

Immediate Action may forestall the emergency.

PREPARATIONS

Task	Difficulty	Char	C+S
Pre-Journey Checks	Average 2D	C5	12
Begin	Average 2D	C5	12

DRIVING

Routine Road	Easy 1D	C2	6
Allowed Terrain	Average 2D	C2	12
*Disallowed Terrain	Staggering 5D	C2	
*Speed +1	= Difficulty +1		
*Speed - 1	= Difficulty - 1		
*Evasive	= Difficulty +1		

FLYING

Routine Flight	Average 2D	C2	6
Air Corridor	Easy 1D	C2	6
*Disallowed Terrain	Staggering 5D	C2	
*Speed +1	= Difficulty +1		
*Speed - 1	= Difficulty - 1		
*Evasive	= Difficulty +1		
*Landing	Difficult 3D	C2	

SEAFARING

Routine Sailing	Easy 1D	C2	6
*Disallowed Terrain	Staggering 5D	C2	
*Speed +1	= Difficulty +1		
*Evasive	= Difficulty +1		
*Rough Seas	= Difficulty +1		

SPACEFLIGHT

Routine Flight	Easy 1D	C2	6
Climb To Orbit	Difficult 3D	C2	
*Disallowed Terrain	Staggering 5D	C2	
*Speed +1	= Difficulty +1		
*Evasive	= Difficulty +1		
*Hit Jump Point	Difficult 3D	C5	
*Enter Atmosphere	Difficult 3D	C2	
*GG Level Change	Difficult 3D	C2	

CONCLUSION

Shutdown	Easy 1D	C2	6

COMPUTER CONTROLLED VEHICLES

A Vehicle with an On-Board Brain may be computer-controlled.

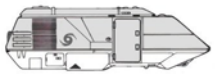
Vehicle operation is based on the Computer's C+S. C is any required Characteristic; S is any required skill.

An On-Board Brain essentially transforms the Vehicle into a Strangeform Robot.

Be sure to note the On-Board Brain's Hobby (if applicable).

Altitudes

Atmospheres have levels corresponding to Range Bands. UWP Atmosphere varies by Altitude, which in turn dictates which levels are available to Flyers.



2 Vehicle Altitudes

Levels of the Atmospheres — Ellipsoid

Altitude	R=	Level	Vacc 0	Vthin 2	Thin 4	Standard 6	Dense 8	Exotic A	Corrosive B	Insidious C	Dense High D	Polar E1	Arctic E2	Tropical E3	Equatorial E4	Thin Low F	Comments
250,000 km	11	Satellite	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Luna= 384,000 km
50,000 km	10	Geo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	For Terra= 36,000 km
5,000 km	9	Far Orbit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MEO = Medium Earth Orbit
500 km	8	Orbit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	LEO = Low Earth Orbit
50 km	7	Upper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
30 km	6.8	Mid8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
20 km	6.6	Mid6	0	0	0	0	1	1	1	1	1	0	0	0	0	0	
12 km	6.4	Mid4	0	0	0	1	2	2	2	2	2	1	0	0	0	0	
8 km	6.2	Mid2	0	0	1	2	4	4	4	4	4	2	1	0	0	0	
5 km	6	Mid	0	1	2	4	4	4	4	4	4	4	2	1	0	1	
1000 m	5	Airspace5	0	1	2	4	6	6	6	6	6	4	4	2	0	2	
500 m	4	Airspace4	0	2	4	6	8	A	A	A	A	6	4	2	1	2	
150 m	3	Airspace3	0	2	4	6	8	A	A	A	A	6	4	2	1	2	
50 m	2	NOP	0	2	4	6	8	A	A	A	A	6	4	2	1	2	
5 m	1	Near Surface	0	2	4	6	8	A	A	A	A	6	4	2	1	2	Typical Grav Altitude
1.5 m	T		0	2	4	6	8	A	A	A	A	6	4	2	1	2	
0.5 m	R		0	2	4	6	8	A	A	A	A	6	4	2	1	2	Typical Lifter Altitude
Surface	0	Surface	0	2	4	6	8	A	A	A	A	6	4	2	1	2	
500 m	-4	Chasm Rim	0	2	4	6	8	A	A	A	A	6	4	2	1	2	
1000 m	-5	Chasm Wall	1	4	6	8	A	A	A	A	A	8	6	4	2	4	
5 km	-6	Chasm Floor	2	4	6	8	A	A	A	A	A	8	6	4	2	4	

On This Table: 2= Very Thin. 4= Thin. 6= Standard (=Earth. =Terra). 8= Dense (regardless of Taint). Treat A as Very Dense.

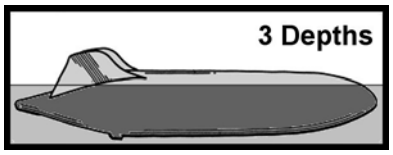
Vehicles and Levels of the Atmospheres

Altitude	R=	Level	Winged	Rotor	Flapper	LTA	Lifter	Grav	HePLaR	Comments
			Atm not Required							
50,000 km	10	Geo	No	No	No	No	No	No	Yes	For Terra= 36,000 km
5,000 km	9	Far Orbit	No	No	No	No	No	Yes	Yes	MEO = Medium Earth Orbit
500 km	8	Orbit	No	No	No	No	Yes	Yes	Yes	LEO = Low Earth Orbit
200 km	7.4	Upper4	No	No	No	No	Yes	Yes	Yes	
100 km	7.2	Upper2	Yes	No	No	No	Yes	Yes	Yes	Distinct sublevels within Range=7.
50 km	7	Upper	Yes	No	No	No	Yes	Yes	Yes	
5 km	6	Mid	Yes	No	No	Yes	Yes	Yes	Yes	
1000 m	5	Airspace5	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
500 m	4	Airspace4	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
150 m	3	Airspace3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
50 m	2	NOP	**	Yes	Yes	Yes	Yes	Yes	Yes	Typical Grav Flyer Altitude
5 m	1	Near Surface	**	Yes	Yes	Yes	Yes	Yes	Yes	
1.5 m			**	Yes	Yes	Yes	Yes	Yes	Yes	
0.5 m			**	Yes	**	Yes	Yes	Yes	Yes	Typical Lifter Flyer Altitude
Surface		Surface	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Landing Grounds

Entries on this table show Atmosphere Levels available to Flyers based on Motive. No= Not accessible. Yes= Accessible as shown. ** Winged Flyers pass through these levels when landing or taking off.

Depths

Oceans (and lakes) have depths corresponding to Range Bands. Various depths have increased pressure.



DEPTHS OF THE OCEANS

Altitude	R=	Level	Pond	Stream	Lake	River	Large Lake	Harbor	Bay	Sea	Ocean	World Ocean		Pressure	Comments
50 m	2	Tsunami	-	-	-	-	-	-	-	-	a	a	a		
5 m	1	Vbig Waves	-	-	-	-	-	-	-	-	a	a	a		
1.5 m		Big Waves	-	-	-	-	a	-	-	a	a	a	a		
.5 m		Waves	a	a	a	a	a	a	a	a	a	a	a		
Surface	0	Surface	a	a	a	a	a	a	a	a	a	a	a		Lake, Sea, Ocean Surface
.5 m		Turbulent	a	a	a	a	a	a	a	a	a	a	a		
1.5 m		Vturbulent	a	a	a	a	a	a	a	a	a	a	a		
5 m	1	Pond	a	a	a	a	a	a		a	a	a	a	1	Pond
50 m	2	Thermocline	-	a	a	a	a	a	a	a	a	a	a	5	Pond Bottom
150 m	3	Shelf	-	-	a	a	a	a	a	a	a	a	a	15	Continental Shelf
500 m	4	Lake Bottom	-	-	a	a	a	a	a	a	a	a	a	50	Lake Bottom
1,000 m	5	Deep Lake	-	-	a	-	a	a	-	-	a	a	a	100	Deep Lake
5,000 m	6	Sea Bottom	-	-	-	-	-	-	-	-	a	a	a	500	Ocean Bottom
50 km	7	Deep Ocean	-	-	-	-	-	-	-	-	-	a	a	5,000	Maximum depth non-Ocean World
500 km	8	Abyss	-	-	-	-	-	-	-	-	-	a	a	50,000	Ocean World Abyss
5,000 km	9		-	-	-	-	-	-	-	-	-	a	a	500,000	

Entries on this table show available levels: those marked “a” (available) and may exist in water terrain on a world; those shaded and marked: “-“ are unavailable.

Pressure in Bar (= one Atmosphere). Pressure-1 inflicts 1D hits per minute.

Vehicles and Terrain

The capabilities of vehicles in terrain are detailed in this chart.

SURFACE TERRAIN		Cars		ACV	Wheel	Track	Legged	Lifters	G-Drive
Terrain	People	Trucks	OffRoad	STV	MTV	ATV	Units	Grav	Grav
Air Corridor	No	No	No	No	No	No	No	Yes1	Yes1
Grid	No	Yes1	Yes1	**	**	**	No	Yes1	**
Highway	**	Yes	Yes	**	Yes	**	No	Yes	**
Road	**	Yes	Yes	**	Yes	Yes	Yes	Yes	**
Trail	Yes	**	**	**	**	**	Yes	**	**
Clear	Yes	**	Yes	Yes	Yes	Yes	Yes	**	**
Clear Wooded	Yes	**	**	**	**	Yes	Yes	**	**
Wetland	Yes	**	**	Yes	**	**	Yes	**	**
Wetland Wooded	Yes	**	**	**	**	**	Yes	**	**
Rough	Yes	**	**	**	Yes	Yes	Yes	**	**
Rough Wooded	Yes	**	**	**	**	Yes	Yes	**	**
Mountain	Yes	**	**	**	**	Yes	Yes	**	**
River, Canal	**	**	**	Yes	Yes	Yes	**	**	**
Lake	No	No	No	Yes	Yes	**	**	**	**
Ocean	No	No	No	Yes	No	No	No	**	**

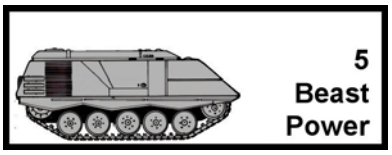
FLYERS TERRAIN						Lifters	G-Drive	M-Drive	
Terrain	People	Wing	Flap	Rotor	LTA	Grav	Grav	Grav	HePLar
Orbit	No	No	No	No	No	Yes	Yes	Yes	Yes
Upper Atm = 7	No	No	No	No	No	Yes	Yes	Yes	Yes
Mid Atm=6	No		No	No	No	Yes	Yes	Yes	
Low Atm= 3-4-5-	No					Yes	Yes	Yes	
NOP =2	No	Yes	Yes	Yes		Yes			
< 5 meter	Yes			Temp	Temp	Yes	Temp	Temp	
Atm=0 Vacuum	No	No	No	No	No	Yes	Yes	Yes	Yes
Atm=1 Trace	No	No	No	No	No	Yes	Yes	Yes	
Atm=2 Vthin	No	Yes	No	No	No	Yes	Yes	Yes	
Atm=3 Vthin	No	Yes	No	No	No	Yes	Yes	Yes	
Atm=4 Thin	No	Yes	No	No	No	Yes	Yes	Yes	
Atm=5 Thin	No	Yes	No	No	No	Yes	Yes	Yes	
Atm=6 Standard	No	Yes	No	Yes	Yes	Yes	Yes	Yes	
Atm=7 Standard	No	Yes	No	Yes	Yes	Yes	Yes	Yes	
Atm=8 Dense	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Atm=9 Dense	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Atm=A Exotic	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Atm=B Corrosive	No	Yes		Yes	Yes	Yes	Yes	Yes	
Atm=C Insidious	No	Yes			Yes	Yes	Yes	Yes	
Atm=D Dense-Hi	No	----- Dependent on other details -----				Yes	Yes	Yes	
Atm=E Ellipsoid	No	----- Dependent on other details -----				Yes	Yes	Yes	
Atm=F Thin-Low	No	----- Dependent on other details -----				Yes	Yes	Yes	

SEAFARING TERRAIN					
Terrain	People	Boat	Ship	H-Foil	Sub
Ocean	No	**	Yes	Yes	Yes
Islands	No	Yes	**	Yes	**
Shore	No	Yes	**	Yes	**
River	No	Yes	**	**	**
Sea Port	No	Yes	Yes	Yes	Yes

Entries on these tables show accessible terrain for vehicles. **No** = Prohibited terrain. **Yes** = Accessible terrain. **Yes1** = Accessible if equipped for the Grid. ****** Disallowed Terrain (accessible with some difficulty; see Vehicle Operations).

Beastpower

Beastpower is a measure of relative work or power when comparing vehicles.



BP BEASTPOWER

Tons	Kph= / Speed=	5 1	10 2	20 3	30 4	50 5	100 6	300 7	500 8	700 9	1000 10	2000 11	3000 12	5000 13
Half-lan			.01	.2	.3	.6	1							
1 lan		.01	.1	.3	.6	1.2	2	3	5	7	10	13	17	22
1 emthree		.08	.6	2	5	9	16	26	38	54	75	99	129	164
1 roup		.1	.8	3	6	12	20	30	50	70	100	133	172	220
1 cube		0.3	2	7	16	31	54	85	128	182	250	332	432	549
1 sq		0.5	4	13.4	32	62	108	171	256	364	500	666	864	1098
1 ton		1	8	27	64	125	216	343	512	729	1000	1331	1728	2197
2		2	16	54	128	250	432	686	1024	1458	2000	2662	3456	4394
3		3	24	81	192	375	648	1029	1536	2187	3000	3993	5184	6591
4		4	32	108	256	500	864	1372	2048	2916	4000	5324	6912	8788
5		5	40	135	320	625	1080	1715	2560	3645	5000	6655	8640	10985
6		6	48	162	384	750	1296	2058	3072	4374	6000	7986	10368	13182
7		7	56	189	448	875	1512	2401	3584	5103	7000	9317	12096	15379
8		8	64	216	512	1000	1728	2744	4096	5832	8000	10648	13824	17576
9		9	72	243	576	1125	1944	3087	4608	6561	9000	11979	15552	19773
10		10	80	270	640	1250	2160	3430	5120	7290	10000	13310	17280	21970
11		11	88	297	704	1375	2376	3773	5632	8019	11000	14641	19008	24167
12		12	96	324	768	1500	2592	4116	6144	8748	12000	15972	20736	26364
13		13	104	351	832	1625	2808	4459	6656	9477	13000	17303	22464	28561
14		14	112	378	896	1750	3024	4802	7168	10206	14000	18634	24192	30758
15		15	120	405	960	1875	3240	5145	7680	10935	15000	19965	25920	32955

Column Shift:

Vheavy	Speed +1
Vlite	Speed - 1
High Power	Speed +1
Protected	Speed +1
Armored	Speed +2
Watercraft Ship	Speed +3
Watercraft Sub	Speed +2
Watercraft Boat	Speed +1
Hydrofoil	Speed - 1

For example, a Speed-3 Vheavy ATV reads Beastpower on the Speed 4 (= Speed-3 +1) column.

BEASTPOWER

Beastpower is a standardized evaluation of the power of the engine or motor in a vehicle.

ONE BEASTPOWER=

BP = Tons x (Speed ^3)

Beastpower is used to compare the relative power of different vehicles.

UNITS OF MEASURE

Tons are 13.5 cubic meters for vehicles.

For beasts and beast-drawn vehicles, 1 ton (normally a measure of volume) is also = 1000 kg in a wheeled cart on level ground.

Half-Lan= 1 person/ human = 50 liters = 0.005 tons.

1 Lan = 0.01 ton = 1 centiton.

1 Emthree = 0.075 ton = 1 cubic meter.

1 Roup = 0.1 ton = 1 deciton.

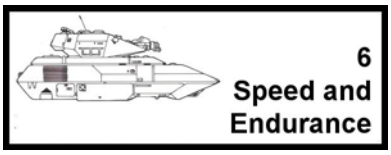
1 Cube = 0.25 ton = 1 quarter ton.

1 Sq = 0.5 ton = half-ton.

One Human = 0.25 BP

Speed And Endurance

Vehicles have Speeds, which determine ability to travel, and collision damage values. Speed and Endurance are used to determine Range.



VEHICLE SPEEDS

Speed	Flux	Speed	Alt Speed	kph	Air	Water	Land	Land	Gravitics	Damage	Speed
0		Not Moving	Still								0
1	6	Creep	Walk	5			Person	Mole		1 D	1
2	- 5	Crawl	Run	10			Legged			4 D	2
3	- 4	Xslow		20			OffRoad		Lifters	9 D	3
4	- 3	Vslow		30		Boat	ATV	Tracked		16 D	4
5	- 2	Slow		50	LTA	Ship	MTV	Wheeled	G-Drive	25 D	5
6	- 1	Standard		100	Flapper	Sub	STV	Air Cushion		36 D	6
7	0	Cruise		300	Rotor			Road	M-Drive	49 D	7
8	+1	Fast		500	Wing					64 D	8
9	+2	Vfast		700						81 D	9
10	+3	Sonic		1000						100 D	10
11	+4	Ssonic		2000						121 D	11
12	+5	Hsonic		3000						144 D	12
13	+6	Xhsonic		5000						169 D	13
14	+7			10,000						196 D	14
15	+8			20,000						225 D	15
16	+9	Meteroric	Meteor	40,000						256 D	16

An impact by an object at Speed inflicts Damage at the level shown per ton. The damage inflicted is Blow.

Relative Speed. A Collision between two Vehicles uses the sum of their two speeds (if they are travelling in the same direction, uses the difference between the two speeds).

Reciprocal Damage. Each Vehicle in the collision receives Damage x Opposite Vehicle.

ENDURANCE AND RANGE

Vehicle Range is the expected distance that a Vehicle can travel before it needs maintenance, resupply, or refueling. Range is based on Vehicle Speed and Endurance.

CONVERT ENDURANCE TO RANGE

Kph=	5	10	20	30	50	100	300	500	700	1000	2000	3000	5000
Speed=	1	2	3	4	5	6	7	8	9	10	11	12	13
Hours=	Local				Regional		Continental				World		
Days=	Regional			Continental			World						
Weeks=	Continental		World										
Months=	Continental	World											
Year=	World												

VEHICLE OCCUPANTS

For Time=	Vlite	Lite	Std, Hvy Vhvy
Hours	1	2	1 per 1 ton
Days	no	1	1 per 2 tons
Weeks	no	no	1 per 3 tons
Months	no	no	1 per 4 tons
Year	no	no	1 per 5 tons

Assumes Human (Size=100) occupants.

OCCUPANT SIZE

Size		Human-Equivalents
50	Small	C1 C2 C3 = 1D each
100	Standard	C1 C2 C3 = 2D each
200	Oversize	C1 C2 C3 = 3D each
300	Titan	C1 C2 C3 = 4D or 5D each

Average Size

To determine the average size for a Sophont,

Total the number of dice used to generate the Physical Characteristics (halving Grace, Agility, and Vigor; doubling Stamina). Divide the total by 6 and multiply by 100. The result is typical size for the sophont.

Calculating Species or Sophont Size

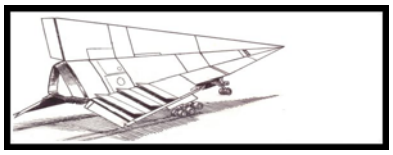
C1 Strength	Dice	
C2 Dexterity	Dice	
C2 Grace	Dice / 2	makes it lighter or smaller
C2 Agility	Dice / 2	makes it lighter or smaller
C3 Endurance	Dice	
C3 Stamina	Dice * 2	makes it heavier or larger
C3 Vigor	Dice /2	makes it lighter or smaller

Dice= Number of dice rolled for the characteristic (for example, if Str = 2D, Dice = 2).

Total= C1 + C2 + C3
Typical Size = 100 * (Total / 6).

The Design Box

The Tonnage Design Box allows a rough calculation of the (displacement) tonnage of vehicles as they are designed.



THE TONNAGE DESIGN BOX

Vehicle dimensions can be estimated using known vehicle tonnage and the Vehicle Design Box.

Tonnage can be estimated using known vehicle dimensions and the Vehicle Design Box.

Vehicle Dimensions

If the tonnage of a vehicle is known, select a tonnage row and determine the Length, Width, and Height dimensions for the vehicle.

Vehicle Tonnage

If the dimensions of a vehicle are known, select a row with the appropriate dimensions and determine the tonnage for the vehicle.

Adjustments

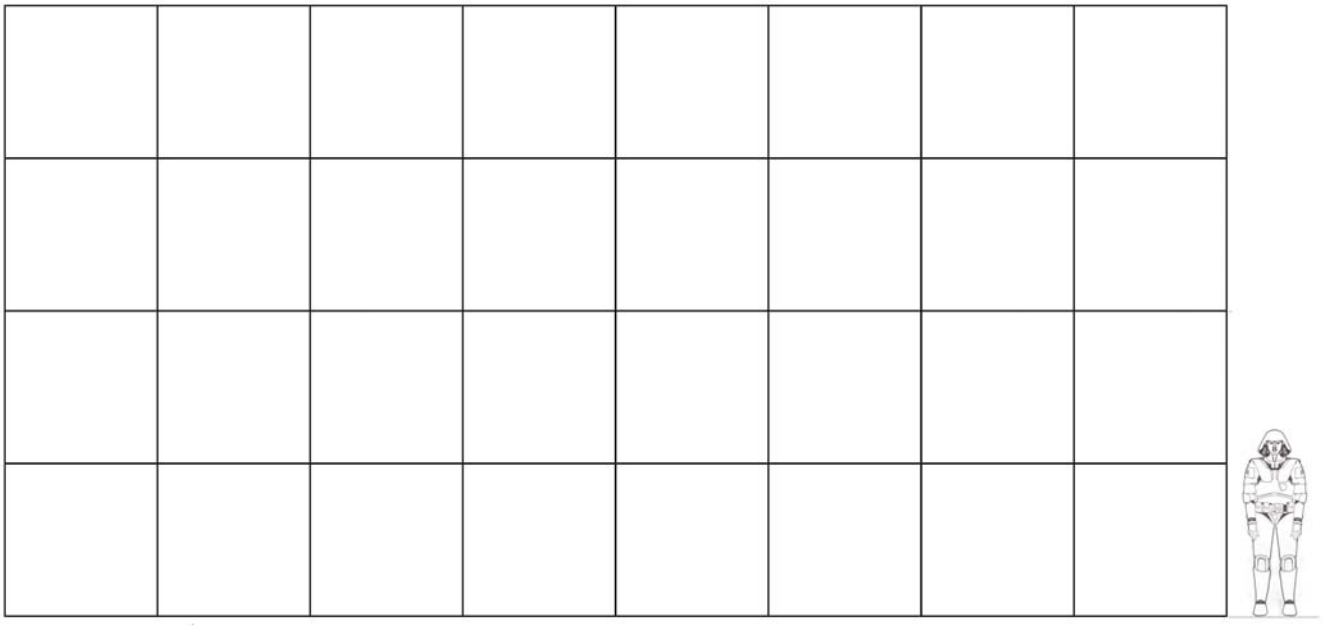
Dimensions should be reasonably compact; adjust them as necessary.

Ignore wings and wing tonnage.

VEHICLE SIZE

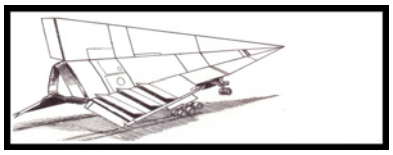
	---------- Meters ----------			-------- Squares --------		
Tons	Length	Width	Height	Length	Width	Height
1	3	3	1.5	2	2	1
1	6	1.5	1.5	4	1	1
2	6	3	1.5	4	2	1
3	9	3	1.5	6	2	1
4	12	3	1.5	8	2	1
5	7.5	3	3	5	2	2
6	9	3	3	6	2	2
7	10.5	3	3	7	2	2
8	12	3	3	8	2	2
9	9	4.5	3	6	3	2
9	13.5	3	3	9	2	2
10	15	3	3	10	2	2
11	10.5	4.5	3	7	3	2
12	12	4.5	3	8	3	2
13	13.5	4.5	3	9	3	2
15	15	4.5	3	10	3	2
16	16.5	4.5	3	11	3	2

THE DESIGN BOX



Charts Overview

This is an overview of the charts which govern the use and creation of vehicles.



VEHICLE CHARTS OVERVIEW

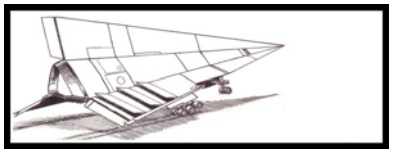
- **0 Vehicle Charts Overview**
- **1 Vehicle Operations.** Typical tasks for operation of vehicles. Required Skills and Knowledges.
- **2 Altitudes**
  - **Altitudes of the Atmosphere.** Altitudes and Ranges for Flyers.
  - **Vehicles and Levels of the Atmospheres.** Altitude Capabilities by Vehicle Type.
- **3 Depths**
  - **Depths of the Oceans.** Depths and Ranges for Submersibles.
- **4 Vehicles and Terrain.**
  - **Surface Vehicle Terrain.** Accessible and Inaccessible Terrain Types by Vehicle.
  - **Flyer Terrain.** Accessible and Inaccessible Atmospheric Terrain by Flyer Motive.
  - **Seafaring Terrain.** Accessible and Inaccessible Water Terrain by Watercraft Type.
- **5 Beastpower.** Calculation of Beastpower BP ratings for Vehicles.
- **6 Speed and Endurance.**
  - **Vehicle Speeds.** Equivalent kph values for Speeds. Collision Damage Values.
  - **Convert Endurance to Range.** Expected Range values based on Endurance.
  - **Vehicle Occupants.** Calculation of Vehicle Occupant Capacity. Non-Human Occupants.

VEHICLE CREATION CHARTS

- **0 Vehicle Creation Checklists.**
- **1 Creation Chart- Surface Vehicles**
  - **Civil Ground Vehicles.** Type. Mission. Motive.
  - **Military Vehicles.** Type. Mission. Motive.
- **2 Creation Chart- Flyers and Watercraft**
  - **Flyers.** Type. Mission. Motive.
  - **Watercraft.** Type. Mission. Motive.
- **3 Creation Chart- Small Craft**
  - **Small Craft.** Type. Mission. Motive.
- **4 Creation Chart- Vehicle Options**
  - **Standard Options.** Bulk. Stage. Environ. Available Options. Endurance.
- **5 Vehicle Fillform.**
- **6 Vehicle Fillform Example.**

Vehicle Creation Checklist

Use this checklist to create individual vehicles.



Prepare a blank Vehicle Fillform. This form is the documentation for the Vehicle's capabilities.
Prepare a blank Vehicle HitForm. This form locates and records damage to a Vehicle.

VEHICLE DESIGN CHECKLIST

1. Vehicle Category.

Type-Mission-Motive Chart

2. Type.
3. Mission.
4. Motive.

Vehicle Enhancers Chart

5. Bulk
6. Stage.
7. Environ.
8. Options.
9. Endurance.

Additional Steps

10. Create weapons for Vehicle Weapons Mounts (using Weapons Creation).
11. If desired, install an On-Board Brain (using Vehicle Operations).
12. Calculate Range (using Speed and Endurance).
13. Calculate Vehicle Occupants (using Speed and Endurance).

Vehicle Hitform Data

14. Create the Vehicle Identification (Model. Bulk-Mission-Motive-Type) and transfer it to the Vehicle Hitform.
15. Create the Vehicle Extension and transfer it to the Vehicle Hitform.
16. Transfer Weapon information to the Vehicle Hitform.
17. Record Armor/ Protection on the Vehicle Hitform.

Vehicle Design Fillform

As the Vehicle is designed, insert the design values and details into this Fillform. Values may be inserted in any order as the design is considered: the ultimate requirement is that the values balance and properly reflect the charts and tables.

Vehicle Fillform

BUILDING VEHICLES

This Fillform allows an interactive design process which ultimately produces a final vehicle design.

Tech Level. Tech Level for a vehicle is the minimum level required for manufacture.

VEHICLE TYPE

☐ Ground	☐ Military	☐ Watercraft
☐ Flyer	☐ Small Craft	☐

(identifies the chart used to create the vehicle)

Item	Code	Q	R	E	B	S	Tech Level	Tons	Speed	Load	Armor Ar	Cage Ca	FlashProof Fl	RadProof Ra	SoundProof So	PsiShield Ps	Insulated In	Sealed Se	KCr
Vehicle																			
Mission																			
Motive																			
Bulk																			
Stage																			
Environ																			
Option1																			
Option2																			
Option3																			
Option4																			
Option5																			
Range																			
Totals																			

VEHICLE IDENTIFICATION

Model	Bulk	Mission	Motive	Vehicle		TL
					-	

VEHICLE EXTENSION

	Bulk	Stage	Environ	Range	Tons	Speed	Load	
(					Tons=	Speed=	Load=	)

Ground Vehicles

Ground vehicles (civil or military) operate on or near world surfaces.

GROUND VEHICLES

	Code	Type	TL	Tons	Speed	Load		Armor	Cage	FlashProof	RadProof	SoundProof	PsiShield	Insulated	Sealed	Note	KCr
Type	C	Car	-	2	-	1	-	-	-	-	-	-	-	-	-	-	20
	-	Van	-	3	-	2	-	-	-	-	-	-	-	-	-	-	30
	T	Truck	-	4	-	3	-	-	-	-	-	-	-	-	-	-	50
	V	Vehicle	-	5	-	3	-	-	-	-	-	-	-	-	-	-	60
	M	Mover	-	3	-	-	-	-	-	-	-	-	-	-	-	-	50
	T	Transport	-	5	-	4	-	-	-	-	-	-	-	-	-	-	40
Mission	-	(blank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P	Passenger	-	-	-	-	-	5	-	-	-	-	-	12	-	-	10
	C	Cargo	-	-	-	-	-	5	-	-	-	-	-	6	-	-	10
	U	Utility	-	-	-	-	-	5	-	-	-	-	-	6	-	-	10
	X	Explorer	-	-	-	-	-	20	10	10	10	10	-	20	20	-	100
Motive	ACV	Air Cushion	8	+2	6	-	-	-	-	-	-	-	-	-	-	-	x2
	W	Wheeled	6	0	5	-	-	-	-	-	-	-	-	-	-	-	
	L	Lifter	9	+1	3	-	-	-	-	-	-	-	-	-	-	-	x2
	G	Grav	10	-1	5	-	-	-	-	-	-	-	-	-	-	-	x3
	T	Tracked	7	+2	4	-	-	-	-	-	-	-	-	-	-	-	x2

An ACV Explorer Vehicle is an STV Some Terrain Vehicle.
A Wheeled Explorer Vehicle is an MTV Most Terrain Vehicle.
A Tracked Explorer Vehicle is an ATV All Terrain Vehicle.

MILITARY VEHICLES

	Code	Type	TL	Tons	Speed	Load		Armor	Cage	FlashProof	RadProof	SoundProof	PsiShield	Insulated	Sealed	Note	KCr
Type	T	Tank	9	5	3	-	-	50	10	10	10	20	0	20	20	NoteT	700
	C	Carrier	8	4	4	2	-	40	10	10	10	20	0	20	20	NoteC	500
	V	Vehicle	7	2	5	1	-	30	10	10	10	20	0	20	20	NoteV	300
Mission	-	(blank)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	W	Weapon	-	+2	- -	-	-	-	-	-	-	-	-	-	-	NoteV	100
	T	Troop	-	+1	- -	-	-	-	-	-	-	-	-	-	-	-	- -
	S	Supply	-	+3	- 1	+1	-	-10	-	-	-	-	-	-	-	-	- -
	R	Recon	-	-1	+1	-	-	-10	-	-	-	-	-	-	-	-	100
Motive	ACV	Air Cushion	8	+2	6	-	-	-	-	-	-	-	-	-	-	-	x2
	W	Wheeled	6	0	5	-	-	-	-	-	-	-	-	-	-	-	
	L	Lifter	9	+1	3	-	-	-	-	-	-	-	-	-	-	-	x2
	G	Grav	10	-1	5	-	-	-	-	-	-	-	-	-	-	-	x3
	T	Tracked	7	+2	4	-	-	-	-	-	-	-	-	-	-	-	x2

Quality = Motive TL minus Actual TL.

A Military vehicle automatically has weapons mount capabilities.
NoteT. Install TWO weapons: one Vehicle-Mount and one Turret-Mount.
NoteC. Install ONE turret mount weapon.
NoteV. Install ONE fixed mount weapon (supercedes NoteT or NoteC).

FLYERS

Code		Type	TL	Tons	Speed	Load	Armor	Cage	FlashProof	RadProof	SoundProof	PsiShield	Insulated	Sealed	Note	KCr
Type	F	Flyer														
Mission	A	Attack, Combat	+2	x2	+1	x2	20	0	20	0	20	0	10	1		x3
	B	Bomber	+1	x3		x3	10	0	20	0	20	0	10	1		x2
	C	Cargo	0	x4	0	x2	5	0	20	0	20	0	10	1		x1
	P	Protector	+1	x2	+1	x1	10	0	20	0	20	0	10	1		x3
	S	Scientific	- 1	x4	0	x2	5	0	20	0	20	0	10	1		x2
	U	Utility				x3	0	0	20	0	20	0	10	1		x1
Motive	W	Winged	7	10	8	2										300
	R	Rotor	8	10	7	0.5										400
	F	Flapper	10	10	6	0.5										500
	Lta	LTA	6	40	5	10										600
	L	Lifter	9	8	2	1										600
	G	Grav	10	9	4	3										700

Quality = Motive TL minus Actual TL. **Light-Than-Atmosphere.** LTA final tonnage equals 10x the calculated tonnage.

WATERCRAFT

Code	Type	TL	Tons	Speed	Load	Armor	Cage	FlashProof	RadProof	SoundProof	PsiShield	Insulated	Sealed	Note	KCr
Type	Ship	5	1000		600	10	0	0	0	0	0	0	0		1,000
	Sub	6	100		60	20	0	0	0	0	0	0	20		1,000
	Boat	5	10		6	5	0	0	0	0	0	0	0		100
	Grav	10	/5		n/c										x2
Mission	Cargo			-1											
	Patrol	+2		+1		x2									
	Explorer	+2										x2			
	Transport														

Quality = Motive TL minus Actual TL. n/c = NoChange.

VEHICLE OPTIONS

	Use or Code	Type	TL	Tons	Speed	Load	Armor	Cage	FlashProof	RadProof	SoundProof	PsiShield	Insulated	Sealed	Note	KCr
Bulk	Vl	Vlight	-1	/3	+1	- 2	/3			/3			/3	/3		/3
	L	Light	-1	/2	+1	-1	/2			/2			/2	/2		/2
	M	Medium (blank)	-	-	- -	-								- -		
	H	Heavy	+1	x2	- 1	+2	x2			x2	x2		x2	x2		x3
	Vh	VHeavy	+2	x3	- 2	+3	x3			x2	x2		x3	x3		x9
Stage		Fossil	-2	+2			-10				-10				Note1	
		PowerCell	-1	+1	-2	-2	-5				-5				Note1	10
		Renewable	-1	+1	-1	-1									Note1	20
		Vearly	-2	+1	-1	-1										20
		Early	-1	+1			-10				-10					10
		Standard	0	0												
		Improved	+2	-1			+10				+10					20
		Advanced	+4	-2	+1	+1	+20				+20					40
Environ		Air (Open)	-2	0												
		Enclosed	-1				4		4		4		12			
		Sealed	-	0			6	2	6	0	8	0	16	20		2
		DoubleSealed	-	+1			8	4	6	0	12	0	30	20		5
		Insulated	-				8	4	6		12		30	20		10
		Protected	+1	+1			10	10	10	10	12	0	10	20		20
		Armored	+2	+1			20	10	10	10	12	0	20	20		30
		UpArmored	+3	+2			30	20	20	20	20	0	30	20		40
		AltArmored	+3	+2			60	20	30	30	30	0	30	30		50
Options		High Powered	+1	+1	+1	-1										100
		Slave	+1	-1												10
		Remote	+1	-2												20
		Weapon Mount	-			- 1										
		Luxury	-												Q= 4	x 2
ground		OffRoad	-													30
		Fast	+1	+1	+1	-2										30
water		HydroFoils	+1	+1	+1											30
flyer		Stubs	-												Grav or Lifter	20
ground		Mole	+1	x3	=1										Note 2.	400
flyer	VTOL	Mod	-		- 1	-2									Medium or less	100
flyer	STOL	Mod	-			-1									Heavy or less	50
	Passenger	Module	-		- 3										20 passengers	100
	Cargo	Module	-	+1	-1	+1									one ton	20
flyer	Lifting	Body Hull	-	+4	+1	x2										200
flyer	Add-On	Wings-1	-	x2	+1	x1									B= +1	100
flyer	Add-On	Wings-2	-	x3	+2	x2									B= +1	200
flyer	Add On	Wings-3	-	x4	+3	x3									B= +1	300
flyer	Float	Landing Gear	-	- 1	- 1											100
flyer	Parasite	Nipple	+1			-1										100
	Redundancy		+1	+1												60

Note1. May not be Grav or Lifter. Note 2. Only if Ground Vehicle, Explorer, not ACV.

Endurance		Hours	-	0*												
converts		Days	+1	1*												20
to		Weeks	+2	2*												50
Range	LR	Months	+3	3*												100
	VLR	Year	+4	4*												400

* this value times Vehicle Speed.

SMALL CRAFT

	Code	Type	TL	Tons	Accel (G)	Load	Armor	Cage	FlashProof	RadProof	SoundProof	PsiShield	Insulated	Sealed	Notes	MCr
Type		Pod	13	5	2	1	20	10	20	20	10		20	20		5
		Fighter	11	10	6	1	40	10	10	10	10		10	10		9
		Launch	12	20	3	10	20	10	10	10	10		10	10		8
		Boat	12	30	5	19	30	10	10	10	10		10	10		7
		Pinnace	14	40	4	25	30	10	10	10	10		10	10		9
		Cutter	12	50	4	31	40	10	10	20	10		10	10		13
		Lander	10	60	1	24	20	20	20	20	10		20	20		10
		Shuttle	11	70	4	42	20	10	10	20	10		20	10		11
		Picket	13	80	6	20	30	10	10	10	10		10	20		10
Mission		Utility	-1	+5	-1	+5										
		Long Range				-10										+1
		Life	-1		-1	+3										-1
		Fast	+1		+1	-5										+1
		Slow	-1		-2	+5										-1
		Passenger		+20		+15									**P**	+4
		Cargo	-1	+25	-1	+25	-10						-10		**C**	+5
		Tanker	-1	x2	-1	x2	-10						-10			x2
		Attack	+1	+10	+1		50	10	10	20	10		10	10		x4
		Recon	+1		+1	/2	20	10	10	20	10		10	10		x2
Options		Flotation Mod				-1										+1
		Modular	+1													+1
		Passenger Mod				-30										
		Vehicle Mod				-30										
		Weapon Mount				-1										+1
		Redundancy				-1										+1
		Stubs (Wings)			+1											
		Wings		+1	+1											+1
Motive		G-drive (standard)														x1
		M-drive				+5									**M**	**x2**
Bulk	Vl	Vlight	-1	/3	+1	/3	/3			/3			/3	/3		/3
	L	Light	-1	/2	+1	/2	/2			/2			/2	/2		/2
	M	Medium (blank)	-	-	- -	-								- -		
	H	Heavy	+1	x2	- 1	x2	x2			x2	x2		x2	x2		x3
	Vh	VHeavy	+2	x3	- 2	x3	x3			x2	x2		x3	x3		x9
Endurance converts to Range		Hours		-1												
		Days														
		Weeks		+2												+5
	LR	Months	+1	+5												+20
	VLR	Year	+2	+15												+40

Notes. C= Load is dedicated to cargo space. M= Small Craft operation requires skill in M-drive. P= Load is at least **1/2** passenger space.

Vehicle Examples

The following weapon examples demonstrate the output of the armor generation system.

VEHICLES

Code	Type	TL	Tons	Speed	Load (tons)	Armor	Cage	FlashProof	RadProof	SoundProof	PsiShield	Insulated	Sealed	Note	KCr
Cargo Hauler Aircraft		4	25	9	17	9	0	24	0	24	0	22	1	A	305
GroundCar		5	2	5	1	9	0	4	0	4	0	24	0	C	35
Agent's GroundCar		7	2	6	0	30	10	10	10	20	0	20	20		2505
Enclosed Air/Raft		8	7	3	5	9	0	4	0	4	0	24	0		145
Light Grav Speeder		9	3.5	7	4	9	0	4	0	4	0	24	0		245
Tracked AT		9	5	4	1	50	20	20	20	32	0	40	40		625
GCarrier		12	8	4	4	100	30	40	40	50	0	50	50	G	1555
Torgee-1 Grav Tank		12	8	5	3	110	30	40	40	50	0	50	50	T	2455

Notes:
A: Similar to a DC-3.
C: High-powered, offroad-capable, weapon mount included.
G: Turret weapon sold separately.
T: Vehicle mount weapon and Turret weapon sold separately.

SMALL CRAFT

Code	Type	TL	Tons	**Accel (G)**	Load (tons)	Armor	Cage	FlashProof	RadProof	SoundProof	PsiShield	Insulated	Sealed	Note	MCr
Light Lifepod		11	3	2	2	10	10	20	10	10		10	10		2
Std Fighter		11	10	6	1	40	10	10	10	10		10	10		9
Fast Launch		13	20	4	5	20	10	10	10	10		10	10		9
Slow Launch		11	20	1	15	20	10	10	10	10		10	10		7
Fast Boat		13	30	6	14	30	10	10	10	10		10	10		8
Slow Boat		11	30	3	24	30	10	10	10	10		10	10		6
Fast Pinnace		15	40	5	20	30	10	10	10	10		10	10		10
Slow Pinnace		13	40	2	30	30	10	10	10	10		10	10		8
Modular Cutter		13	50	4	31	40	10	10	20	10		10	10		13
Std Shuttle		11	70	4	42	20	10	10	20	10		20	10		11
Cargo Shuttle		10	95	3	67	10	10	10	20	10		10	10		16
Interplanetary Cargo Shuttle		10	95	3	72	10	10	10	20	10		10	10	IP	32
Passenger Shuttle		11	90	4	57	20	10	10	20	10		20	10		15
Interplanetary Passenger Shuttle		11	90	4	62	20	10	10	20	10		20	10	IP	30
Fast Shuttle		12	70	5	37	20	10	10	20	10		20	10		12
Interplanetary Fast Shuttle		12	70	5	42	20	10	10	20	10		20	10	IP	24
Light Shuttle		10	35	5	21	10	10	10	10	10		10	5		5.5
Gig		12	20	7	15	40	10	10	15	10		10	10		28

Notes:
IP = Equipped with M-Drive (in place of the standard G-Drive). These craft require M-drive skill to operate, and weekly refueling and maintenance.

Model LongName (Bulk - Motive - Mission - Type -User - TL)

Vx: VEHICLE EXTENSION

Tons	Speed	Load	Stage	Environ	Endurance	QREBS	Options
Vx: Tons=	Speed=	Load=					

The basic information required to use a weapon.

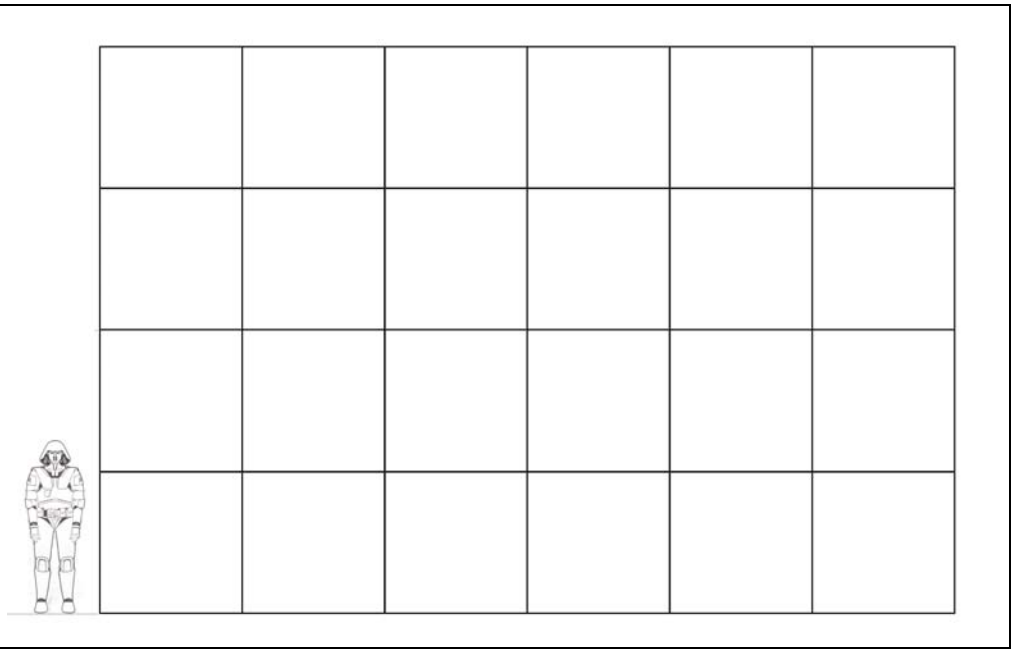
Wx: WEAPON EXTENSION

	Range	Cost	Mass	QREBS	Effects
Wx:	R=	Cr	kg		

The basic information required to use a weapon.

HIT LOCATIONS

Comms	**2**
Cargo	**3**
Sensors	**4**
Protections	**5**
Life Support	**6**
Body Panel	**7**
Power Source	**8**
Locomotion	**9**
Weaponry	**10**
Navigation	**11**
Computer	**12**



Paste any **Traveller** vehicle image here. Include a human figure for scale.

ARMOR / PROTECTION

Armor	
Cage	
FlashProof	
RadProof	
SoundProof	
PsiShield	
Insulated	
Sealed	

COMMENTS

Artillery and Ortillery

The capabilities of weapons are reflected in their controls. These charts determine the controls to be expected on weapons.

INDIRECT FIRE

Some weapons can attack targets which are not directly in their line of sight. This Indirect Fire involves Artillery (high arcing shots which descend on the target), Ortillery (shots dropped from orbit on a target), or Bombing (shots dropped from flyers on a target). In most cases, Indirect Fire is controlled by a Forward Observer.

The Observer Process

A Forward Observer identifies a Target, communicates with an Indirect Fire weapon operator, and tells it the Target's location identifiers (he may give coordinates by voice, or transmit data).

On the Forward Observer's command (Fire One), the weapon shoots one ranging shot. It arrives in the next Round.

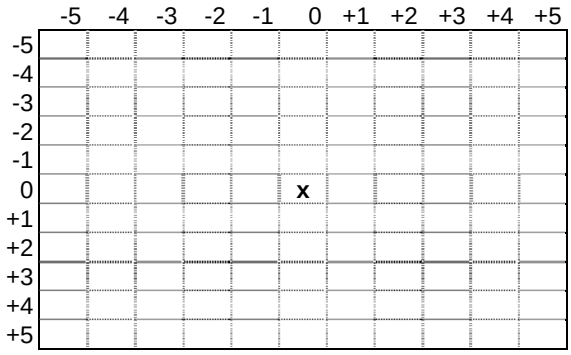
The shot may deviate from a direct hit: roll Flux twice: once for vertical and once for horizontal deviation.

The Forward Observer observes the impact of the shot.

Hit! If it hits, he tells the weapon operator (Hit! Fire For Effect) and the weapon now fires one normal shot. It hits in the next Round.

Miss! If it misses, he tells the weapon operator (Miss! Up X Left Y) and the weapon fires a ranging shot. It hits in the next Round and the process repeats.

THE OBSERVER METHOD



Roll Flux twice: apply it vertically and horizontally to determine where the shot actually hits. On each roll, apply Mod Forward Observer skill (with a sign as appropriate) but never beyond zero on the chart.

Deviation Scale. Indirect Fire weapons deviate in units of 50 meters. This may keep the hits in the same Range Band, or may move it to another Range Band.

The Designator Process

A Forward Observer identifies a Target and is working with either a Remote weapon slaved to the Designator, or with an Indirect Fire weapon at another location.

Indirect Fire Weapons

He is using a Designator. He activates the Designator and fires at the Target.

Hit! If he hits, he Triggers the Indirect Fire Weapon, which then fires and will hit in the next Round. The operator must fire again in the next Round to Redesignate the Target.

A Designator must Hit, but need not Penetrate.

Pre-Shot. An operator may Trigger the Indirect Fire Weapon before he attempts to Designate a Target. In the next Round, he Designates the Target: if he hits, the Indirect Fire Weapon also hits; if he misses, the Indirect Fire Weapon also misses (roll Flux twice for Deviation- it has to hit somewhere).

Designate and Forget. Designators which use Spray leave a residue on the Target. Once it has been hit, the operator may pursue other activities.

Remote Indirect Weapons

A Remote weapon is emplaced at a location and slaved to an operator's Designator. When the Designator is fired, the Remote is automatically ready to fire in support.

Triggered Operation. The Designator fires at the Target. If it hits, the user Triggers the Remote weapon, which fires at the designated target and hits in the next Round.

A Designator must Hit, but need not Penetrate.

Automatic Operation. The Designator fires at the Target, and the Remote automatically fires at the same time.

A Designator must Hit, but need not Penetrate. If the Designator misses, then the Remote misses.

FN. The FN for a Remote depends on its installation.

FN = Char + Skill
Char = Weapon Quality (if not already known, roll 2D-2).
Skill = Installation.

To Install A Remote Weapon
2D < Dexterity + Fighting
Installation = Assets minus Die Roll.

WMD

Weapons of Mass Destruction include Nuclear, Biological, and Chemical Weapons.

WMD-1

A variety of WMD are possible (if not readily available). Effects are in D: Blast-1D, Bang-2D, etc.
Bio and Chemical weapons are clouds or areas of effect, diminishing with distance from the center.

N PLAGUE "NI" — Biological Weapon

R=	Proximity	1D-1	Versus Infect	Inflicts Infect	Inflicts Poison
0	Contact	0	3	6	1
1	Contact	1	3	4	
2	Touch	2	3	2	
3	Miss	3+	0		

Ni is a contact bio-weapon. It does not degrade.

D PLAGUE "DA" — Biological Weapon

R=	Proximity	1D-1	Versus Gas	Inflicts Infect	Inflicts Poison
0	Direct Hit	0	3	3	3
1	Hit	1	3	2	2
2	Near Miss	2	3	1	1
3	Miss	3+	0		

Da is an air-borne infectious bio-weapon. It degrades after one day.

R RAD POINT SOURCE "RUUN" — Nuclear Weapon

R=	Proximity	1D-1	Versus Rad	Inflicts Rad
0	Direct Hit	0	9	5
1	Hit	1	6	4
2	Near Miss	2	3	2
3	Miss	3+	0	

Ruun is a radioactive object. It does not degrade.

Kh RADIATION "KH" — Nuclear Weapon

R=	Proximity	1D-1	Versus Rad	Inflicts Rad
0	Direct Hit	0	6	6
1	Hit	1	4	4
2	Near Miss	2	2	2
3	Miss	3+	0	

Khulanii is a radioactive area dust contamination. It does not degrade.

G POISON GAS "GALI" — Chemical Weapon

R=	Proximity	1D-1	Versus Gas	Inflicts Suff	Inflicts Poison	Inflicts Stench
0	Direct Hit	0	3	10	5	0
1	Hit	1	3	8	4	0
2	Near Miss	2	3	2	2	0
3	Miss	3+	0	0	0	0

Gali is an odorless suffocating gas. Degrades 1 per minute.

Z POISON GAS "ZALA" — Chemical Weapon

R=	Proximity	1D-1	Versus Gas	Inflicts Suff	Inflicts Poison	Inflicts Stench
0	Direct Hit	0	3	2	10	5
1	Hit	1	3		8	4
2	Near Miss	2	3		2	2
3	Miss	3+	0		0	0

Zala is a poison gas with an identifiable odor. It degrades 1 per ten minutes.

T CROWD CONTROL GAS "TAT" — Chemical Weapon

R=	Proximity	1D-1	Versus Gas	Inflicts Suff	Inflicts Poison	Inflicts Stench
0	Direct Hit	0	3	3	1	7
1	Hit	1	3	2		4
2	Near Miss	2	3	1		2
3	Miss	3+	0			1

Tat is a non-lethal gas. It degrades 1 per minute.

V CONTACT POISON "VON" — Chemical Weapon

R=	Proximity	1D-1	Versus Poison	Inflicts Poison	Inflicts Tranq
0	Contact	0	3	5	6
1	Contact	1	3	4	3
2	Touch	2	3	1	1
3	Miss	3+	0		

Von is a surface contaminant. It does not degrade.

R= distance from the release point (assumes a random targeting in the area).
Versus= Weapon attacks as stated against armor and protection. If it overwhelms the protection, use **Inflicts=.**

Range=	0	1	2	3	4	5	6	7	8	9
Range	Contact	Vshort	Short	Medium	Long	Vlong	Distant	VDistant	Orbit	Far Orbit
Distance		5 m	50 m	150 m	500 m	1000 m	5000 m	50 km	500 km	5000 km

WMD

Weapons of Mass Destruction include Nuclear, Biological, and Chemical Weapons.

WMD

A variety of WMD are possible (if not readily available). Note effects are in D: Blast-1D, Bang-2D, etc.

Suitcase

Nuclear Weapon

R=	Proximity	1D-1	Blast	BFE*	Burn	Rad
0	Direct Hit	0		Vaporized 30D		
1	Hit	1		Vaporized 25D		
2	Hit	2	10	12	12	20
3	Vnear Miss	3	5	6	3	20
4	Near Miss	4	1	4	1	5
5	Far Miss	5		2		3
6	Miss	6				

Suitcase is a portable nuclear weapon.

Tactical

Nuclear Weapon

R=	Proximity	1D-1	Blast	BFE*	Burn	Rad
0	Direct Hit	0		Vaporized 50D		
1	Hit	1		Vaporized 40D		
2	Hit	2		Vaporized 30D		
3	Vnear Miss	3	10	12	12	20
4	Near Miss	4	5	6	3	20
5	Far Miss	5	1	4	1	5
6	Miss	6				

Tactical is a typical battlefield nuclear weapon.

Dirty Tactical is the same weapon with intentional radioactive contamination = 4x Rad.

Strategic

Nuclear Weapon

R=	Proximity	1D-1	Blast	BFE*	Burn	Rad
0	Direct Hit	0		Vaporized 100D		
1	Hit	1		Vaporized 90D		
2	Hit	2		Vaporized 80D		
3	Vnear Miss	3		Vaporized 50D		
4	Near Miss	4	10	12	12	20
5	Far Miss	5	5	6	3	20
6	Miss	6	1	4	1	5

Strategic is a typical strategic nuclear weapon.

Massive Explosion

Missile Warhead

R=	Proximity	Sz-1D	Blast	BFE*	Rad	Burn
0	Direct Hit	5		Vaporized 100D		
1	Hit	6	90 D	20 D	10 D	30 D
2	Hit	7	40 D	15 D	10 D	20 D
3	Vnear Miss	8	30 D	10 D	10 D	10 D
4	Near Miss	9	10 D	5 D	5 D	5 D
5	Far Miss	10	5 D	1D	1D	1D
6	Miss	11				

Assumes Missile-5 Warhead.
Sz-1D is Missile Size minus 1D.

Missiles-4-5-6-7 Warheads can inflict Massive Explosion.
Missile-5 is the Benchmark for effects.
Missile-4 inflicts one-tenth damage,
Missile-6 inflicts double damage.
Missile-7 inflicts triple damage
Bang=0 if in space.
Non-Nuke ignore EMP and Rad.
Explosive (not Nuke) inflicts one-tenth damage.
AM Anti-Matter inflicts additional triple damage.

Effects in Space

Weapons in Vacuum inflict Blast at one-tenth Effect.
Bang= 0.

Using These Tables

Each of the weapons on this page vaporizes the target with a Direct Hit.

If the result is potentially NOT a Direct Hit, roll 1D-1 (or Missile Size – 1D for Massive Explosion) and implement the noted Effects instead.

*BFE= Bang, Flash, and EMP are each inflicted in this amount.
*BF = Bang and Flash are each inflicted in this amount.
R= distance from the release point (assumes a random targeting in the area).
Versus= Weapon attacks as stated against armor and protection. If it overwhelms the protection, use **Inflicts=.**

Range=	0	1	2	3	4	5	6	7	8	9
Range	Contact	Vshort	Short	Medium	Long	Vlong	Distant	VDistant	Orbit	Far Orbit
Distance		5 m	50 m	150 m	500 m	1000 m	5000 m	50 km	500 km	5000 km

Military Explosions

Many military weapons are explosives, or create explosions.

Explosions

A variety of military explosive weapons are available, either as battlefield events, or as the projectiles of other weapons. Note effects are in D: Blast-1D, Bang-2D, etc.

Grenade

Military Explosions

R=	Proximity	1D-1	Blast	Bang	Frag	Flash
1	Hit	0	1	2	1	
2	Near Miss	1		1		
3	Miss	2				

Grenade is hand (manipulator) thrown.

Flash-Bang

Military Explosions

R=	Proximity	1D-1	Blast	Bang	Frag	Flash
1	Hit	0	1	4	1	6
2	Near Miss	1		2		3
3	Miss	2				

Flash-Bang is a distracting device.

60-Sec

Military Explosions

R=	Proximity	1D-1	Blast	Bang	Frag	Flash
1	Hit	0	1	2	1	
2	Near Miss	1		1		
3	Miss	2				

Alternative Grenade. Attacks as Grenade after a delay (thrown in Turn=1; screams its message all through Turn=2; explodes in Turn=3). Grenade screams (in local language): "I AM A 60-SECOND GRENADE, 59, 58, 57…."

IED

Military Explosions

R=	Proximity	1D-1	Blast	Bang	Frag	Flash
1	Hit	0	2	3	2	1
2	Near Miss	1	1	2	1	
3	Miss	2		1		

Improvised Explosive Device. Remotely triggered.

Artillery Shell

Military Explosions

R=	Proximity	1D-1	Blast	Bang	Frag	Pen
1	Hit	0	3	4	5	3
2	Near Miss	1	2	3	3	
3	Miss	2	1	2	1	

Artillery Shell is an incoming attack from distant artillery.

Ortillery Shot

Military Explosions

R=	Proximity	1D-1	Blast	Bang	Frag	Flash
1	Hit	0	1	2	1	
2	Near Miss	1		1		
3	Miss	2				

Ortillery Shot is an incoming attack from orbit (alternative to Ortillery missiles).

AF Warhead

Military Explosions

R=	Proximity	1D-1	Blast	Bang	Frag	Pen
1	Hit	0	5	3	10	4
2	Near Miss	1	3	2	5	
3	Miss	2	1	1	3	

Anti-Flyer Warhead attacks flyers.

AA Warhead

Military Explosions

R=	Proximity	1D-1	Blast	Bang	Frag	Pen
1	Hit	0	2	2	1	5
2	Near Miss	1	1	1		
3	Miss	2				

Anti-Armor Warhead attacks tanks and vehicle armor.

Hvy AA Warhead

Military Explosions

R=	Proximity	1D-1	Blast	Bang	Frag	Pen
1	Hit	0	2	2	1	10
2	Near Miss	1	1	1		
3	Miss	2				

Heavy Anti-Armor Warhead (upgraded in effects) attacks tanks and vehicle armor.

Land Mine

Military Explosions

R=	Proximity	1D-1	Blast	Bang	Frag	Flash
1	Hit	0	2	3	10	1
2	Near Miss	1	1	2	2	
3	Miss	2		1		

Land Mine attacks individual who moves into the same Range Band.

AA Land Mine

Military Explosions

R=	Proximity	1D-1	Blast	Bang	Frag	Pen
1	Hit	0	2	3	2	10
2	Near Miss	1	1	2	1	
3	Miss	2		1		

AA Land Mine ignores individuals; attacks ground vehicle which moves into the same Range Band.

Environmental Effects

Benchmarks provide insights into the expected consequences of commonplace situations

7-1

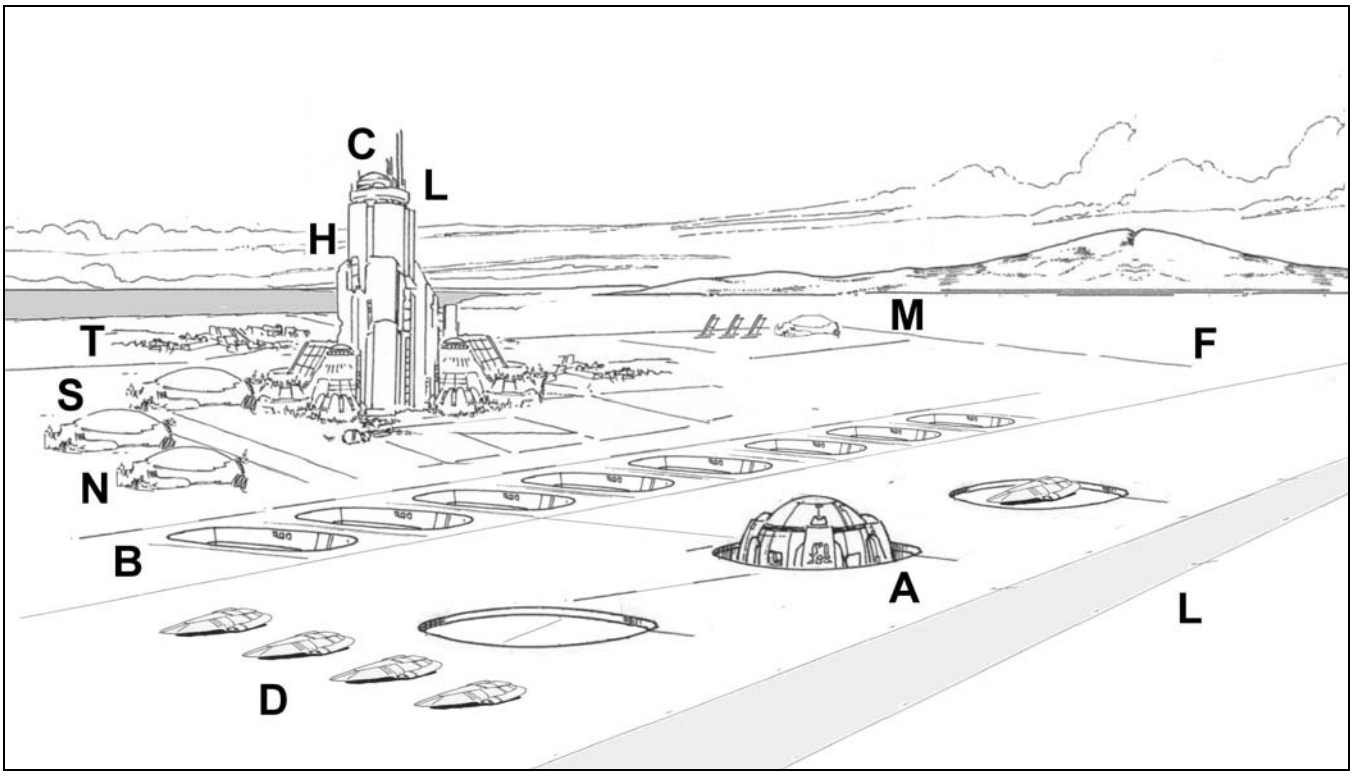
	Code	Event	Effect1	Effect2	Effect3	Comment		TC
Temperature		Extreme Cold	Cold-25			HZ+2 and outer	= - 100 C	Fr
		Intense Cold	Cold-16				= - 75 C	
		Very Cold	Cold-2			HZ+1		Tu
		Cold	Cold-1				= 0 C	
		Temperate	-none-			Temperate World		
		Hot	Heat-1				= 50 C	
		Very Hot	Heat-2			HZ -1		Tr
		Intense Heat	Heat-16				= +125 C	
		Extreme Heat	Heat-25			HZ -2 and inner	= +150 C	
		Slow Reentry	Heat-50				= +200 C	
		Reentry	Heat-2000			Typical orbital rentry	=	
		Reentry Plus	Heat-3000			Orbital reentry to Dense Atm	=8+	
Atmosphere	0	Vacuum	Suff-3					Va
	1	Trace	Suff-3					
	2	Very Thin Tainted	Suff-2	Poison-1		Combination-5		
	3	Very Thin	Suff-2			Respirator-5		
	4	Thin Tainted	Suff-1	Poison-1		Combination-5		
	5	Thin	Suff-1			Respirator-5		
	6	Standard	-none-					
	7	Standard Tainted		Poison-1		Filter-3		
	8	Dense	-none-					
	9	Dense Tainted		Poison-1		Filter-3		
	A	Exotic	Suff-1 or	Infection-1 or		Breather-9 or Rebreather-10		
	B	Corrosive	Corrode-1	Poison-1				
	C	Insidious	Corrode-2	Poison-2				
	D	Dense High						
	E	Ellipsoid						
	F	Thin-Low						
		Underwater	Suff-2			for Air Breathers		
		Smoke, Dust	Suff-1					
		Heavy Smoke	Suff-2					
		Chemical Smoke	Suff-2	Poison-1				
Radiation		Non-Radioactive	-none-					
		Mildly Radioactive	Rad-1					
		Radioactive	Rad-2					
		Highly Radioactive	Rad-3					
		Stellar Flare	Rad-1-2-3	EMP-2				
		Nuclear Explosion	Rad-1-2-3			Otherwise quite distant.		
		Fallout	Rad-1-2-3					
Impacts, Falls and Collisions		Trip and Fall	Wound-1					
		Hi-G Trip and Fall	Wound-2					
		Very High Fall	Wound-N			N= Range.		
		One-Story Fall	Wound-2			Height = 3 meters		
		Traffic Collision	Wound-1-2-3			Reasonable speeds		
		Crash	Wound-3-4-5			Higher speeds		
Weather		Storm	Blast-1-2					
		Blizzard	Blast-1-2	Cold-1-2-3				
		Hurricane	Blast-1-2-3					
		Tornado	Blast-2-3-4					
		Hail	Frag-1					
		Typhoon	Blast-1					
		Turbulence	Blast-1					
		Scirroco	Blast-1	Hot-1-2-3		Hot Winds.		
		Lighting	Elec-5					
		Thunder	Bang-5					
		Bright Sun	Flash-1	Hot-1		Unrelenting Desert Sun		

	Code	Event	Effect1	Effect2	Effect3	Comment	TC
Events and Encounters		Volcanic Eruption	Blast-1	Frag-1	Burn-1		
		Allergic Reactions	Tranq-1-2-3			Actual Effects vary wildly	
		Poison Reactions	Poison-1-2-3				
		Fire	Burn-1-2-3				
		Loud	Bang-1				
		Decompression	Suff-2				
		Flood	Cold-1	Suff-2			
		Rough Vegetation	Cut-1			Thorns.	
		Plague	Infection-1-2-3				
		Short Circuit	Elec-2				

	Code	Event	Effect1	Effect2	Effect3	Comment	TC
Stars and Space		Star	Flash-3	Heat-3		In Space. Quite Close	
		Star	Flash-2	Heat-2		In Space. Closer Than HZ	
		Star	Flash-1	Heat-1		In Space. In Habitable Zone	
		Star				In Space. Farther Than HZ.	
		Vacuum	Suff-3				
		Stellar Flare	Flash-4	Rad-1-2-3	EMP-1	In Space.	
Stars and Space		Nova	Flash-9	Heat-9	EMP-4	In Space. Quite Close	
		Nova	Flash-7	Heat-7	EMP-3	In Space. Closer Than HZ	
		Star	Flash-5	Heat-5	EMP-2	In Space. In Habitable Zone	
		Star	Flash-3	Heat-3	EMP-1	In Space. Farther Than HZ.	

			Inflicts	Intensity			
Body Weapons		Fists	Blow	1D			
		Horns	Cut	1D			
		Tusks	Infection	1D			
		Fangs	Cut	1D			
		Teeth	Cut	1D			
		Claws	Cut	1D			
		Hooves	Blow	1D			
		Spikes	Cut	1D			
		Sting	Poison	1D	or Tranq		
		Gripper	Blow	1D			
		Grasper	Blow	1D			
		Tentacle	Blow	1D			
		Hand	Blow	1D			
		Paw	Blow	1D			

THE TYPICAL STARPORT



The Elements of a Typical Starport.

A. Premium Landing Bays. Elevator platforms retract to the subsurface level. Sheltered access; protection from the elements; priority resupply.

B. Safe Bays. Elevator platforms retract to the subsurface level. As with Premium Landing Bays, Safe Bays have sheltered access; protection from the elements; priority resupply. There are some ship size restrictions.

C. Control Complex. The space traffic control

D. The Cheap Seats. Inexpensive ship parking or storage. Ships are exposed to the elements; access requires walking or driving across the tarmac to a ship.

F. Perimeter Fence. Protective barriers limited access to the starport. The fence is both a security barrier limiting access to unauthorized personnel, and a safety barrier preventing access by animals or locals.

H. Travellers' Aid Society Hotel and Complex. Accommodations for travelers for and ship crew.

L. Lone Star. A popular meeting place for ship crews (and for gawking tourists and wannabees).

M. SDE Starport Defense Establishment. Note the defensive anti-ship missile launchers.

N. Naval Base. Naval administration and offices.

S. Scout Base. Scout Service administration and offices.

T. Startown (outside the starport perimeter). Startown is the local community which supports the starport labor force. Many businesses in Startown supply goods and services for travelers and ship crew.

Y. Landing Strip. Supports winged ships requiring an Air Strip.

Not Shown. Underground access to Premium and Safety Bays and the vast concourse of services available.
Not all starports will have all of the facilities shown here.

Starports

Every adventure begins and ends at a starport. They are the central crossroads that all interstellar traffic must pass through. It stands to reason, then, that interstellar travellers naturally gravitate to starports... to meet starships and crew, to buy and sell cargoes, and to begin and end their adventures.

Starports offer **two** opportunities for adventure. Travellers can board a ship and travel to the next world, or they can follow the concourse to the main gate and move out to explore the world they are on. In both cases, there is an infinity of opportunities for adventure.

Beginning Adventures. An adventure can start anywhere, but for convenience and for continuity, a starting point must be assigned. That assignment says that an adventure begins at a starport. When characters enter a starport, their intent is to find adventure. The details of that adventure may not become clear until later, but the adventure clearly begins at the starport.

Ending Adventures. Likewise, the details, the climax and even the payoff for adventures may take place anywhere, but every adventurer knows in his or her heart that it's not over until they reach the starport.

The Endless Cycle. So, at the very moment that an adventure ends, a new one begins. The endless cycle in **Traveller** is the end of an old adventure and the beginning of a new one; each builds on the previous, and the cycle never ends until the characters stop going to the starport.

THE SITUATION INSYSTEM

A star system is composed of a primary star and one or more stellar companions. Orbiting these stars are a variety of planets, planetoid belts, and gas giants. Orbiting planets and gas giants are a variety of satellites. But the focus is one world... the mainworld... which is the overall best planet or satellite in the system.

The mainworld has a starport which, for all practical purposes, is the destination of interstellar traffic entering the system. Starports vary in their capabilities and facilities, depending on the details of the world itself.

CLASSIFICATION OF STARPORTS

Starports (and spaceports) are classified by their capabilities and by their location.

Starport Types (and Capabilities)

Starport type is based on a simple letter classification system (ranging from A to E) which details their basic facilities.

A. Excellent Quality Starport. Facility with refined and unrefined fuel available on site. Facilities include capability to perform annual overhaul and new starship construction (TNAS certified designs). A naval base may be present. A scout base is usually not present. A surface installation is present. A highport may be present.

B. Good Quality Starport. Refined and unrefined fuel available on site. Facilities include capability to perform annual overhaul and new spacecraft construction (TNAS certified designs). A naval base may be present. A scout base may be present. A surface installation is present. A highport may be present.

C. Routine Quality Starport. Unrefined fuel available on site. Facilities include some capability for repair (primarily replacement of TNAS-certified parts). A naval base is usually not present. A scout base may be present. A surface installation is present. A highport is usually not present.

D. Poor Quality Starport. Unrefined fuel available on site or close by. It has no repair or construction facilities. A naval base is not present. A scout base may be present. A surface installation is present. A highport is not present.

E. **Frontier Starport.** With no facilities, the installation is little more than a flat expanse of bedrock and a sign. This designation effectively means there is **no** starport, but there have been previous landings and that location is indicated in astrogation records.

X. **No Spaceport Or Starport.** The world has no indigenous space access capability.

Spaceport Types (and Capabilities)

Worlds other than the mainworld in a system may also have spaceports.

F. Routine Quality Spaceport. Unrefined fuel available on site and minor repair facilities. A system defense field may be present. A military base may be present. A surface installation is present. There is no highport. This designation is a poor cousin to starport type B.

G. Poor Quality Installation. Unrefined fuel available nearby. No repair facilities are available. A system defense field may be present. A military base may be present. A surface installation is present. There is no highport. This designation is a poor cousin to starport type C.

H. Primitive Quality Installation. No facilities beyond a beacon identifying the location. Unrefined fuel may be available nearby. This is a surface installation; there is no highport. A system defense field may be present. A military base may be present. This designation is a poor cousin to starport type D.

Y. No Spaceport Or Starport. The world has no indigenous space access capability.

Location

Every world with a starport has a landing site on the world surface and may have orbital facilities (ports in asteroid belts are a special case).

Down. A starport on a world surface is identified by the world name. Yori Starport is the main starport on Yori. If the world also has a Highport, then the surface port has **Down** somewhere in the name: Sylea Down, Sylea Downport, or Sylea Down Starport.

Why a surface port? Landing close to the market is convenient for all concerned. If the environment is at all tolerable, then life support and labor costs are minimized. Some worlds can't justify at the expense of both a Downport and a Highport, and a surface port is easier to maintain..

Highport. If circumstances justify the costs, a world may also have Highport (an orbital starport). Such orbital installations include **High** in the name: Sylea Highport, Highport Sylea, or High Sylea.

Why a highport? Many very large ships never land on a world surface; the cargo they carry is off-loaded in orbit and shuttled down. Some worlds are naturally inhospitable (bad surface weather, a water world, fluid oceans, or perhaps government type D or E) and ship owners prefer not to risk **their** equipment venturing down to the surface.

Beltport. A starport may be located in an asteroid or planetoid belt. The typical name for a belt starport is **Beltport.**

Spaceports. There is typically one major starport in a star system. Other facilities, especially those on smaller, less important worlds in a system, are called **spaceports**. They are established primarily to foster in-system travel.

Good spaceports are often established in support of farming projects, mining projects, or small colonies.

The distinction between a starport and a spaceport is minor, and based on facilities; the relationship is similar to that between local and international airports.

STARPORT AVAILABILITY

Every world with a starport has a surface location.
Starport A and Population 7+ adds a Highport.
Starport B and Population 8+ adds a Highport.
Starport C and Population 9+ adds a Highport.
Asteroid Mainworlds have a Beltport instead.

STARPORT DETAILS

Type	Quality	Yards	Repairs	Fuel	Down	Highport
A	Excellent	Starships	Overhaul	Both	yes	if Pop 7+
B	Good	Spacecraft	Overhaul	Both	yes	if Pop 8+
C	Routine	--	Major Damage	Unrefined	yes	if Pop 9+
D	Poor	-	Minor Damage	Unrefined	yes	--
E	Frontier	-	-	-	Beacon	--
X	None				no	

SPACEPORT DETAILS

F	Good	-	Minor Damage	Unrefined	yes	no	equivalent to D
G	Poor	-	Superficial	Unrefined	yes	no	equivalent to D
H	Primitive	-	-	-	Beacon	no	
Y	None	-	-	-	no	no	

Beacons. In some cases, a beacon for a long-established frontier starport may no longer be operational.
Type X or Y. Indicates the world has no designated starport or spaceport.

The Starport	**The Terminal**	**Peripherals**	**Startown**
Beacon.	Passenger Concourse.	Bases	Hiring Hall.
Landing Pad.	Freight Docks.	Scout Base.	Lone Star.
Traffic Control Facility.	Customs.	Naval Base.	Traveller's Aid Society.
Auxiliary Control Facility.	Cargo Market.	Military Base	Scout Lounge.
	Accommodations.	SDB Field.	
	Data Terminals.	SDE	
	Message Center.	Sensor Array.	
	Emergency Medical.	Shipyard.	
		Repair Shops.	
		Transport Hub.	

THE ELEMENTS OF THE STARPORT

A starport at its simplest is a bare spot of bedrock capable of supporting a ship which wants to land. The remaining elements of a starport are added later to support and maintain the traffic that passes through the port.

The Basic Elements

Each starport is characterized by a few basic elements. Without them, the starport is not really a starport.

The Beacon. The location of the starport is broadcast throughout the system from a central beacon. At its simplest, the beacon puts out a continuous tone which allows ships to home on its position. In more complex systems, the beacon provides range and position information for ships in the system, traffic control information on sister frequencies.

The Landing Pad and Runways. Starships approach from beyond the atmosphere. When starships set down, most make use of their lifters in order to make a smooth, relatively slow approach along designated approach corridors. To deal with ships with disabled lifters, or for ships which use lifting surfaces, the landing pad includes long, broad runways.

For highports and beltports, this is a designated holding area.

Sensor Arrays. The starport includes a variety of sensors to detect traffic within the system.

Traffic Control Facility. Space traffic controllers provide basic information to ships within the system, vectoring them safely in their approaches or departures. The traffic control facilities are located at the starport.

Auxiliary **Traffic Control Facility.** In some systems, an auxiliary traffic control facility is located in an outer orbit. It senses incoming and outgoing ships and communicates with them.

The Terminal

The starport terminal houses the basic services for passengers and freight.

The Concourse. Passenger services are handled at the concourse. Ticketing, baggage check, and final boarding all take place at this facility.

Freight Docks. Freight (materials carried by ships for a fee) is loaded and unloaded at the freight docks. Speculative cargoes are held until sold at the cargo market.

Customs and Immigration. Applicable laws concerning the people and goods moving to the world are enforced by Customs and Immigration.

The Cargo Market. Speculative cargo is bought and sold at the Cargo Market. A variety of brokers handle the transactions and make the process relatively simple.

Accommodations. Passengers passing through the starport can stay at the starport hotel, buy meals at a variety of restaurants, purchase basic goods and souvenirs at the shops, and pass time at theaters, museums, or entertainment complexes. The level of accommodations available varies widely.

Data Terminals. Information is available about the world, its products and services, and recreation at a variety of data terminals. On some worlds, the data terminal is a computer; on others, they are staff people with prodigious memories; on yet others, they are librarians).

Message Center. Access to communications, including physical mail, electronic mail, telephone, and video is generally available at the message center.

Emergency Medical. Suitable facilities are provided for emergency medical treatment. The medical staff has the training and experience to deal with a wide variety of medical emergencies.

Peripheral Facilities

Situated around the edges of the starport are a variety of associated activities and facilities.

Starport Defense Establishment (SDE). In addition to security personnel (who function as police), a starport may have an SDE (with a military function).

The SDE is established to defend the starport against threats of a higher level than ordinary criminal activity: riot, terrorist, pirate, or military attack, or even disaster response. Its equipment may include troops, fighter craft, missile defenses, and artillery. The SDE (to maintain its independence from the local world) may be an independent local military unit, or a mercenary force specifically created for the job.

Since an SDE is rarely larger than absolutely necessary, it is possible to evaluate the local perceived threats to a starport by observing the size and equipment of the LDE.

Scout Base. The exploratory scout service may maintain a port facility for the support and maintenance of its vessels (including those vessels which it may have out on loan to detached duty scouts). It is possible that the world on which a scout base is located is not a member of the interstellar community which the scout service serves (for example, Imperial Scout bases may be located outside the Imperium).

Many scout bases make the information they have accumulated available outside of their service (including maps, charts, and world surveys).

Naval Base. The Navy may maintain a port facility for the support and maintenance of its vessels. The base includes administrative sections, warehouses for provisions and resupply, and some security personnel.

The continuing interest of naval personnel in their service makes naval bases favorite stopovers for veterans (even of other navies).

Sometimes a specific naval base may be considerably more extensive than the typical installation. Their facilities and equipment come to dominate the starport rather than complement it.

System Defense Field. The interplanetary defense forces of a system may maintain a facility for the support of their vessels (system defense boats) as they rotate off station from the outer reaches of the systems. The field has a minimum of facilities (provisions are trucked in when needed; repair trucks call as required).

Shipyard. Ships are built at shipyards. For ships of moderate size which will be streamlined and capable of landing on worlds, construction often takes place on world surfaces at starport shipyards.

Most shipyards specialize in the construction of a specific assembly (which local industry has shown itself capable of producing) such as jump drives, avionics, detectors, or even stateroom modules. Other components are purchased from other shipyards and imported as part of the TNAS-certified parts system.

Warehouses on-site store components until they are ready for assembly. Ships themselves are constructed in open-air bays (or in enclosed assembly structures if the local environment requires).

Repair Shops. Minor repairs to ships are often performed on the landing pad. More complex or extensive repairs require that the ships be moved to repair bays at the edge of the starport. Support installations near the bays house the instrumentation and equipment necessary for repairs.

Transport Hub. The starport is usually integrated into the global transportation net, and arriving passengers transfer from the terminal to the transport hubs. Depending on the world, the hubs may support sea or undersea transport, air transport, or ground rail transport. In addition, personal vehicle rental is available.

Industry. Many industrial processes are best carried out in zero-G and/or vacuum. What better place for such operations than adjacent to a major orbital transportation center? Industrial modules attached to the Highport create products or commodities which benefit from immediate access to the ships calling at the port. Some factories have long-term supply contracts with the highport itself.

Organization

A starport has an organizational structure which includes a leader and a mission; the details of each starport are different, although they are generally variations on a basic theme.

The Port Authority. Regardless of the local government in power on the world, the governing authority for the starport is the Port Authority. Financed by a variety of charges and levies on passengers, cargo, and ships, the Authority uses its money to build and maintain its facilities, and to provide variety of services. Like starports, Port Authorities vary widely

in structure and approach to their responsibilities. Some are strong corporate organizations devoted to the pursuit of profit; others are non-profit organizations which view their responsibilities more as services to the citizenry; yet others consider themselves a quasi-official arm of local government.

The Port Warden. The person in complete charge of the starport is the Port Warden. Appointed by the Port Authority, the Warden is the chief executive officer for the facility, and wields great, but not unlimited power.

The Mission of the Starport. The starport, as an organization, is committed to a mission (that mission may or may not be clearly or publicly stated). Typical missions are:

> To efficiently provide facilities and services necessary to accommodate interplanetary and interstellar traffic for this world.
>
> To produce a maximum of income for the organization which operates this starport.
>
> To insulate this world, to the maximum extent possible, from outside influences.
>
> To meet the minimum requirements for maintaining interstellar trade.

Regulation Enforcement. The police and security arm of the Port Authority has the responsibility of protecting the orderly operation of the starport and of enforcing its regulations. It consists of enforcers and emergency technicians.

The typical enforcer carries out the role of helpful police officer, often assisting passengers in mundane tasks. Behind the scenes, however, a stronger, better armed force stands ready to back them up if necessary.

Emergency technicians provide basic services such as paramedical response, rescue operations, and fire fighting. Emergency tech stations are situated throughout the starport, providing the ability to make a quick response anywhere within the starport's boundaries.

UNOFFICIAL FACILITIES

Not all facilities at a starport come under the jurisdiction of the Port Authority.

The Scout Lounge. Those who conduct surveys of star systems and who continually venture out into unexplored or under-explored space are a special type of people. After long periods of time alone or with their fellow crew, they naturally gravitate to others of their kind... to share stories and experiences which may help them survive. The typical starport has a Scout Lounge for this type of people.

The Scout Lounge operates as a semi-private club; theoretically anyone can use its services, but in practice it is only patronized comfortably by scouts (and those with an affinity for scouts).

The Hiring Hall. Crew members looking for work gather at the hiring hall. Ships calling at the starport look first to the hiring hall when they need new or replacement crew. Because of ship schedules which must be met, it is possible for a crew person to be hired and off world within a few hours notice.

The Lone Star. Many starports have a recreation facility which welcomes and serves all comers. At its tables, people meet and enjoy light music or video, conversation, and meals. To many the Lone Star is an opportunity to meet others on a casual basis, to develop acquaintances, and even grow them into friendships.

The Traveller's Aid Society. Some individuals make travel their primary vocation. If they are able, they join the Traveller's Aid Society, which provides facilities to its members. The Traveller's Aid Society is a joint operation of several large hotel chains, which provide the facilities within or adjacent to their own hotels and restaurants.

Members join by depositing a large sum of money as an annuity, with the proceeds paying for the benefits they receive.

Startown. Although starports are often established near large cities, the community which springs up at the gates to the starport has come to be called (generically) Startown. This community is the home of many of the starport employees and houses many stores, restaurants, and meeting places that serve those who want to wander outside of the starport's boundaries.

Starport is not a city so much as a neighborhood of the city.

EXTERNAL CONTROLS

Starports and spaceports exist to participate in interplanetary or interstellar trade. They belong to a network of similar installations, and each depends on the other to provide the traffic that gives meaning and purpose to the installation.

Starports and spaceports must be responsive to three distinct external controls or powers.

Local World or System Government. Local government exercises considerable power over a starport (or spaceport). Because of taxation and law, the starport is dependent on the goodwill of local government. This influence is primarily felt in the statement of the mission of the starport.

Interstellar Government. Interstellar government has a vested interest in creating and maintaining viable starports on worlds where trade produces economic benefits. Interstellar Government influences starports through pressure on local government, and by establishing bases (naval or scout) which increase the viability of the local starport.

The Ship Owners and Operators. Ship owners and operators serve starports which allow them to make profits. Even high service fees, taxes, and assessments do not deter them if there are profits to be made.

The Passengers and Freight Shippers. Passengers and Freight Shippers are rarely organized, but their power is felt if they do not patronize a starport. The organization representing the passengers is the Travellers' Aid Society, which works with starports to improve facilities and services as is economically feasible.

Travel Zones

A Travel Zone is a notification that a specific world may be dangerous to travellers.

Amber Travel Zones. An Amber Travel Zone label is cautionary: the location may present some level of hazard to travellers. That hazard may be natural (disease, local predators or parasites), sociological (uncommon or strange social practices), or governmental (repressive, intolerant, or xenophobic policies). Travellers are warned to be aware of these hazards and guard against them. The Amber Travel Zone label is applied by the Travellers' Aid Society.

Red Travel Zones. A Red Travel Zone label is interdictive: the location presents such a level of danger that travel to the location is prohibited. The Red Travel Zone label may be applied by the Travellers' Aid Society, or by an interstellar

government (for the worlds within a system), or by local government (for a world within a system).

UNDERSTANDING STARPORTS

The key to understanding a starport is a continuing awareness of its purpose. Starports exist to foster traffic, and thus trade, between the stars. Governments may attempt to control or suppress the activities of starports, but when they do, they naturally suppress the benefits of trade and commerce for their worlds. The natural state of starports is to flourish; if the starport's world has resource which can be profitably marketed to other worlds, the starport generate economic benefit.

Extra-Territoriality. In order to foster interstellar traffic, starports are extra-territorial. Just as embassies are treated as if they are the territory of their owning nations, starports are treated like they are off-world space. Passengers and crew alike are allowed to leave their starships and wander freely (subject to security and safety restrictions) throughout a starport. Goods are not subject to customs or taxes until they leave a starport. The laws of the world do not apply to until a traveller leaves the starport.

Law and Order. There must be some law and order within a starport, and the means of achieving that order is the local Starport Regulations. Established by the Port Authority, these regulations define in detail what behaviors are permitted and prohibited. For most people, ordinary behavior is sufficient to stay within the regulations. Strange requirements are typically posted clearly.

Ship Construction and Repair. Starships and spacecraft require an extensive system of construction and repair sites, and the overhead of designing and maintaining the many parts which go into ships can be overwhelming. Consequently, many starports subscribe to the TNAS (Quality Ship Design Scheme): a set of standard component specifications which are manufactured on worlds with the appropriate tech level and industrial capacity, but which can be assembled and maintained at any starport of the appropriate type, regardless of local tech level or industrial capacity.

Money. Ultimately, every starport must make money if it is to remain in operation. Starports cannot give their services away, but most find a way to hide those charges away from the consuming public. Restaurant prices include a surcharge that supports the starport; starship lines pay a portion of their ticket price and freight charges to the starport. Since all of this is concealed from the typical passenger, the continuing impression is that the starport is a free facility.

STARPORT AMBIENCE

The ambience of the starport is of prime importance. When travellers arrive at a starport the atmosphere and the condition of the facilities create an impression that will stay with them for a long time. This impression (and the elaboration of this impression) develops over time.

The appearance of a starport may range from modern or new to old and decayed.

The staff of a starport may be respectful and attentive, or rude and obnoxious.

Officials may be straightforward and honest, or they may be corrupt and self-serving.

MANY DIFFERENT STARPORTS

Starports vary in the way they provide their services. Major influences on them include the world trade classifications, the elements of the UWP, and other less clear factors.

Water World. With land at a premium, starships land in the water (perhaps sheltered by natural or artificial islands) and are serviced by boats.

Asteroid Belt. Ships dock in the microgravity of beltport..

Storms. If a world has an exceptionally turbulent atmosphere, most traffic may choose to call at the highport and shuttle down on craft specifically engineered for local conditions.

Corrosive and Insidious Atmospheres. To facilitate ship access for passengers and cargo, and for repair and maintenance, the starport provides large containment bays with decorrosive sprays and habitable environments.

High Law Levels. Worlds with high law levels and a correspondingly oppressive culture impose restrictions on access to the starport. The perimeter interface between the starport and the world is heavily guarded.

THE STARPORT VISIT

A ship entering a star system leaves jump space approximately 100 stellar diameters out. The approach to the starport takes perhaps a day, during which the appropriate radio contact and identification procedure completed.

At the world, the ship completes a landing maneuver while in voice and data contact with the local space traffic controller.

Once at the surface, the ship settles into its assigned landing bay. Cargo and freight are offloaded and passengers debark.

The ship spends several days at the starport loading cargo and freight and booking passengers. During the time, the crew splits its efforts btween maintenance and recreation.

When leaving the starport, the ship coordinates with traffic control and leaves the starport for orbit. From orbit, it maneuvers to 100 planetary diameters out. When it reaches this safe jump point, it then enters jump space en route to its destination.

THE SPECIAL CASES

There are two special cases for starports: the Depot and the Way Station.

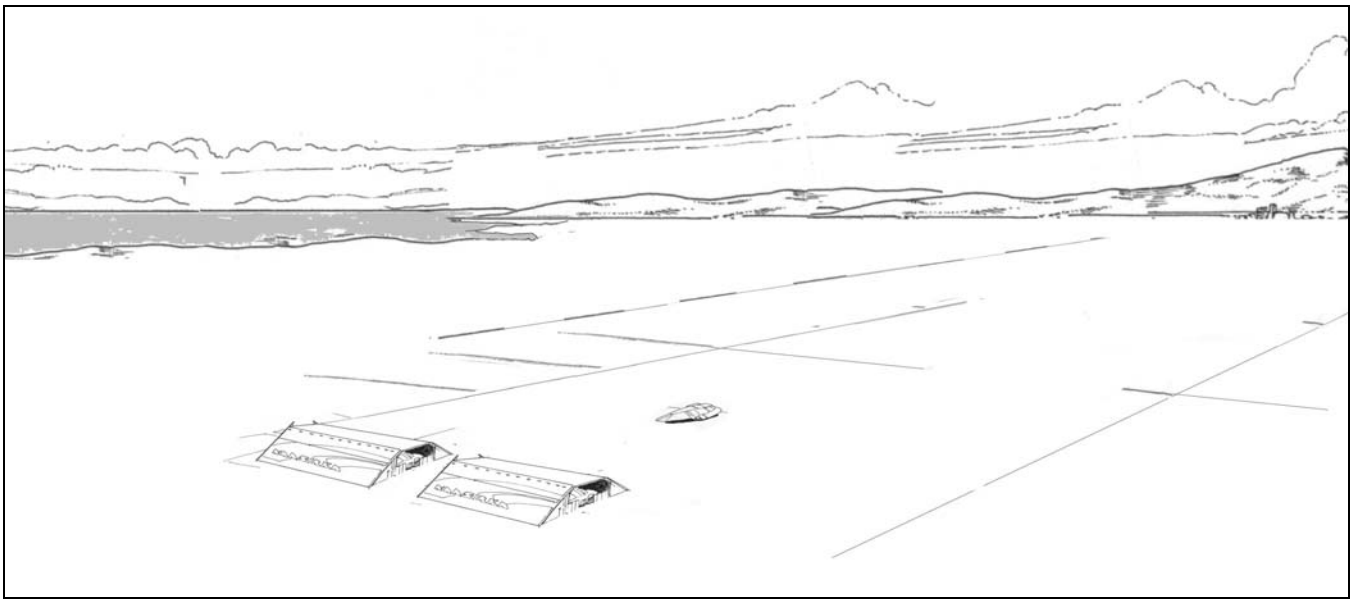
The Depot. A depot is a world-dominating naval base capable of supporting extraordinary numbers of ships and extraordinary levels of repairs.

A depot is present on about one world in a thousand.

The Way Station. A way station is a larger-than-normal scout base dedicated to support of official interstellar courier activity. The Imperium's xboat system carries communications between worlds on an expedited basis. The way station services and maintains the xboats.

A way station is located on main xboat routes about one per 40-50 parsecs.

CLASS E STARPORT



A Typical Frontier Starport

No facilities beyond a broad flat expanse capable of supporting a starship landing peds.
The bay in the background allows ships to refuel.
Note the trading company sheds providing temporary shelter for cargo.

Arriving In A System

A major part of astrogation is planning the journey from one system to the next.

Arrival

ARRIVAL

A starship's arrival in a system is fraught with danger. One moment, the ship is (relatively) safe in Jump Space; the next it is in a new location in totally new circumstances.

Momentum is Conserved. A ship retains its speed and direction in Jump. When it emerges, it continues in its original direction and at its original speed. The final direction may seem random, but it is not. For example, two ships from the same origin jumping to the same destination will emerge at the same speed and direction relative to each other.

ASTROGATION

An Astrogator calculates a Jump based on the intended distance in Parsecs.

Calculating Jumps

To calculate an interstellar jump-1.
Easy (1D) < Int + Astrogator
Uncertain (1D)

The dice for difficulty of the interstellar jump calculation equals the distance in parsecs (Jump-1 difficulty is 1D; Jump-6 Difficulty is 6D).

To manually confirm jump-1 calculations (24 hours).
Average (2D) < Edu + Astrogator
Uncertain (1D).

The difficulty of manually confirming the jump calculation is one level higher than the automated calculation difficulty. Many Astrogators omit this step.

The Astrogator's Role. The Astrogator's responsibility is to plan a straight line course to the destination and avoiding objects which may forces it out of jump before the destination.

Uncertainty. If the jump calculation is wrong (the calculation task fails) and it is used, the actual jump destination is random.

THE 100D RULE

A ship automatically breaks out of Jump Space if its straight line course intersects a sphere 100 Diameters out from a gravity source larger than the ship.

THE 100D RULE

Gravity Source	S=	Comment
Spectral A F Star	12	(usually
Spectra G Star	11	(just beyond
Spectral K M Star	10	(the HZ.
Gas Giant Size	9	includes all Satellites.
World Size 15+	8	
World Size 3+	7	most worlds.
World Size 1, 2	6	
World Size 0	5	Asteroids
Oort Cloud Objects	4	

TYPES OF ARRIVAL

There are three general types of arrival.

The Easy Way

Most Astrogators plot a straight line course from their startpoint to the destination world; in fact, they aim for the center of mass of the destination world. The 100D automatically forces Breakout at 100D from the world.

Planned

Astrogators can plan a breakout anywhere in a system at least 100D from all gravity sources.

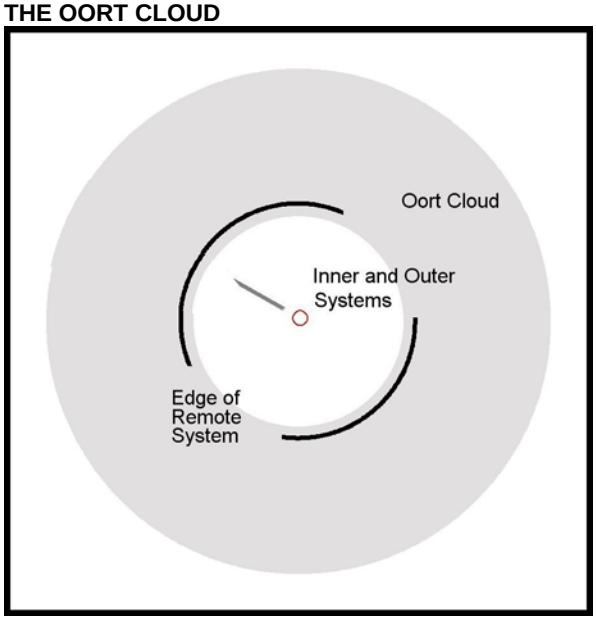
Unplanned

A straight line course may intersect the 100D limit of an object (an asteroid, a comet, a remote system object) which forces the ship out of Jump before reaching the destination world.

Some Pilots plan for this contingency by jumping at zero velocity (so they don't crash into the asteroid that knocked them out of Jump).

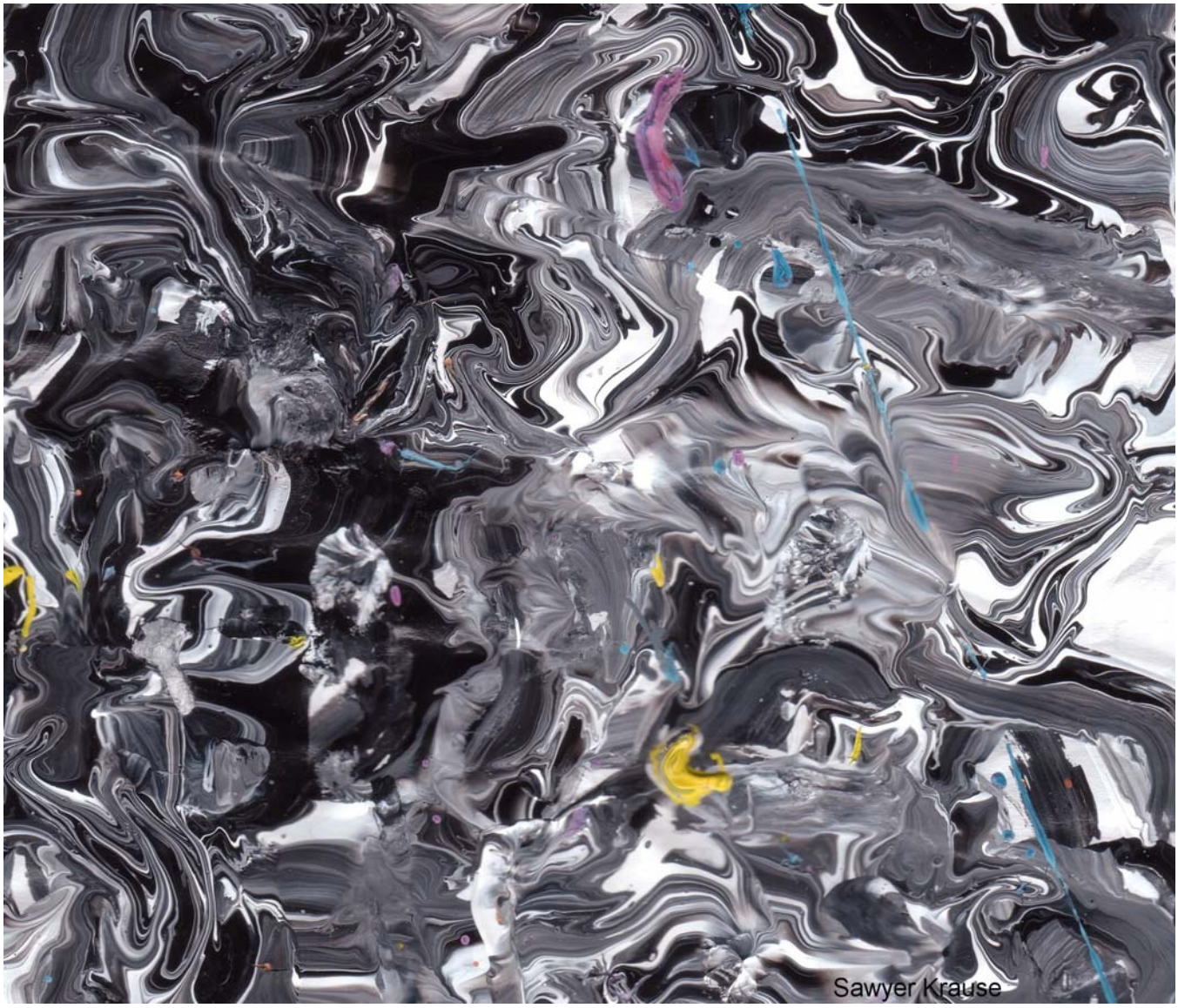
It is impossible to foresee an object this small at such great distances, so an unplanned destination arrival is always a possibility.

THE OORT CLOUD



The OOrt Cloud is a potential problem: its swarm of many small objects potentially ends jump short of the destination.

What Jump Space Looks Like



WHAT'S OUTSIDE THE SHIP?

Jump space is an alternate universe controlled by alien laws of physics. By its very nature, it is destructive to matter and deadly to life.

Jump is the secret to interstellar travel: jump allows ships to travel around the ordinary distances of interstellar space and re-emerge light-years distant in about a week.

Jump Space is an alternative space in which the laws of physics from the true universe do not apply. Jump Space itself is alien: inimical to life and even to matter; it is only the special protections of the jump field that protect a hull and its contents from immediate destruction.

JUMP DRIVES

Ships enter jumpspace by activating an installed jump drive. The jump drive initiates the connection to jumpspace, maintains the ship within jumpspace, and precipitates the ship out of jumpspace.

INITIATION

Initiation is the transition from realspace to jumpspace. Initiation is centered on the jump drive, and extends out for some distance.

Jump Entry Flash. A ship entering jumpspace emits a blinding flash of energy equal to Ship Size plus Mod +4.

The ship's gravitational signature vanishes from any sensors.

Entry Flash is subject to lightspeed. For example, Jump entry at S=12 (= 30 Light-minutes) is detectable to sensors 30 minutes later.

FOR SIMPLICITY

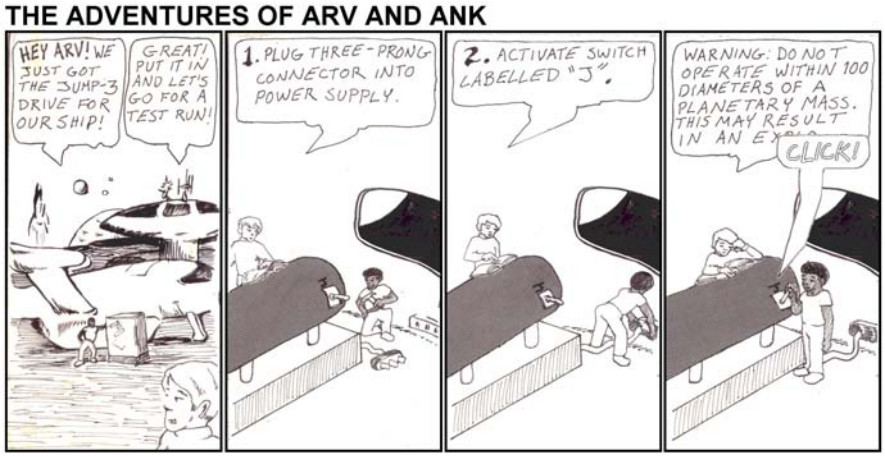
Jump moves a ship from one star system to another in about a week. Travel from the Start World to the Jump Point takes about a day, as does travel from the Jump Point to the Destination World. Only if the unusual happens should details of jump be considered.

Jump Grid Versus Jump Bubble

Two alternate technologies are used for jump drives.

A **Jump Bubble** creates a Jump Field which extends outward from the Jump Drive and encloses the entire ship (and some distance of space beyond). Jump Bubbles allow non-continuous hulls and ships attached to other objects (if they fit within the Jump Bubble) to Jump.

A **Jump Grid** embeds a grid of Jump Field conducting wires with the hull, making the Jump Field conform to the Hull.



Initiation Interference

The vicinity of a jump initiation is a hazardous place. Any ship initiating jump affects smaller objects around it, and is affected by larger objects around it.

Smaller. Smaller objects within 100 diameters of the jumper at the moment the ship transitions into jumpspace suffer a mishap. The opening of Jump Space attempts to carry the smaller objects along, but generally fails, and they are dissipated into component molecules.

Larger. A jumper within 100 diameters of an object larger than itself at the moment the ship attempts to transition into jumpspace finds the larger object interferes with the process. The jump process usually fails and often the jumper is dissipated into component molecules.

Ships must move to 100 D or farther from every possible object (100 world diameters from a world' 100 star diameters from a star; 100 ship diameters froma ship) to attempt a safe jump.

Example: Drop Tanks. Drop tanks illustrate this hazard nicely. In preparation for a jump, drop tanks may be jettisoned at some stage prior to actually entering jumpspace. Being individually smaller than the jumping ship, the tanks suffer mishaps. If a jettisoned drop tank were larger than the jumping ship, the ship would suffer the mishap instead!

Example: Kinunir. A Kinunir-class ship is swarmed by several fighters, all within 100D of it. The ship jumps. At the moment the ship jumps, the fighters each suffer a mishap.

Extreme Example: The Ancients' War. Once upon a time, one of the rebel Grandsons parked a squadron of planet-killers in orbit around a small world and lay siege to one of Grandfather's bases. Grandfather then sprung his trap: he jumped the entire world. The ships of the squadron suffer mishaps.

The Jump Mishap

If Jump produces a Mishap, it cascades through a ship. Consult the Battle Damage charts once for each major component on the ship hit location chart. Determine the Severity of the Damage and the Severity of the Diagnosis for each.

The Jump Drive Balance

A jump drive must be strong enough to enclose the ship's volume with its jumpspace connection, but if it is too strong, initiation stalls.

Even the smallest jump drives stall with any ship smaller than 100 tons, creating an effective lower limit to practical starships.

A 50-ton ship with a minimal size Jump Drive stalls.

That same ship with two 25 ton droptanks, provided that the tanks are not dropped when jumping, is capable of Jump.

SHIPS IN JUMPSPACE

A ship normally remains in jump for 168 hours, plus or minus 10%. Well-tuned ships (usually military) can *choose* the variation, within 1% accuracy.

Time in jump is independent of the distance travelled, or even of events in realspace.

Undetectable. Ships in jumpspace are undetectable. There is no known system available to detect the presence of ships in jumpspace.

There are some psionicists who claim to be able to detect ships in jump, but tests remain inconclusive.

Straight Line Courses. The starting and ending points are connected by a straight line course. The length of the course determines the distance of the jump: any distance up to 1 parsec (including in-system jumps) is Jump-1; any distance beyond that up to 2 parsecs is Jump-2.

The maximum jump distance is theoretically unlimited but as a practical matter has a maximum of 9 parsecs.

PRECIPITATION

The end of jump is technically called Precipitation and more commonly called **Breakout**.

A ship may exit jump space in two ways: at or near the point planned for, or at a point where the straight line course crosses a 100 diameter sphere.

Planned Breakout Point

The course plotted by the Astrogator may include a predicted point for breakout. A successful jump will carry a ship to that predicted breakout point within about S=5 (roll 1D-1). Naval ships roll Good Flux instead.

Breakout points are commonly used in naval operations when maneuvers take ships to locations relatively removed from astral bodies.

Crossing The 100 Diameter Sphere

An astrogator may plot a course which crosses the 100 diameter sphere around a star or world. A ship in jump space automatically breaks out at the point where that course crosses the 100-diameter sphere (with no variation). This technique places the ship in the best possible position to continue its voyage to a world.

Natural Safeguards. The physics of jump space force a ship out of jump space when it crosses the 100-Diameter Sphere. A ship cannot exit jump space within a world, planetoid, star, or even another ship.

Time to Breakout

A typical jump takes about a week (168 hours). The actual time spent varies randomly. Military ships can take slightly less time on average.

Squadron Maneuvers. Highly tuned drives in a squadron of ships, along with highly trained crews, can make their emergence from jump very close to the same time (within about a 5 hour window).

TIME IN JUMP

Flux	Commercial	Naval	T&T	Perfect
- 5	158	162	163.5	165.0
- 4	160	163	164.0	165.2
- 3	162	164	164.5	165.4
- 2	164	165	165.0	165.6
- 1	166	166	165.5	165.8
0	**168**	**167**	**166.0**	**166.0**
+1	170	168	166.5	166.2
+2	172	169	167.0	166.4
+3	174	170	167.5	166.6
+4	176	171	168.0	166.8
+5	178	172	168.5	167.0

Time to breakout is shown in hours.

Commercial. Commercial and private ships using standard drives.

Naval. Military ships in service.

T&T. Trained and tuned. Military ships with highly trained crews and carefully tuned drives.

Perfect. If the rolls produce a perfect jump +/- 0, reroll on the Perfect column.

DETECTION

Ships entering and leaving jump space can be detected.

Entering Jump: A ship entering jump disappears from detector screens. There is a pulse of energy which is detectable to Radar.

Leaving Jump. A ship leaving jump emits a pulse of energy which is detectable to Radar.

In Jump: A ship in jump cannot be detected. A ship in jump is incapable of detecting anything also in jump, or outside of jump.

Emergence Flash. A ship emerging from jumpspace emits a blinding flash of energy equal to Ship Size plus Mod +4.

The ship's gravitational signature appears to sensors.

Emergence Flash is subject to lightspeed (emergence at S=12 = 30 Light-minutes is detectable to sensors 30 minutes later.

Deliberate Precipitation. A ship can deliberately leave jump based on astrogation choices made at Initiation. An astrogator can pre-select (before jump initiates) any point in space (outside any 100D limits) and the ship will exit jump at that point.

Planned Precipitation. An astrogator can plot a straight line course which intersects a 100D volume. At the end of the time in jump, the ship precipitates out at the edge of that volume.

Typically, the 100D volume is centered on the ship's destination world.

Unplanned Precipitation. A straight line course may (inadvertently) intersect a 100D volume. As a result the ship is precipitated out of jumpspace at the edge of that volume (after about 168 hours in jump).

Good astrogators carefully review planets, satellites, asteroids, and comets along the planned course to avoid Unplanned Precipitation.

Nevertheless, most systems have a surrounding Oort Cloud with objects large enough to pose an astrogation hazard. Occasionally, a ship's straight line course intersects the 100D limit of an object bigger than the ship, triggering an Unplanned Precipitation.

Two considerations apply: larger ships are less vulnerable to Oort Cloud precipitation because there are fewer larger bodies; and the triggering body is usually a source of water ice or hydrogen suitable for refueling.

BASIC PERFORMANCE

Jump takes time, energy, and the appropriate drive.

Jump Ranges. The jump drives for a ship determine how far it can jump. Jump capacity can range from 1 to 9 (which is possible range in parsecs). A ship can make a jump equal to or less than its jump capacity. A ship with Jump-1 can travel one parsec in about a week; a ship with jump-6 can travel six parsecs in about a week.

Jump Time. All jumps take about a week: 168 hours plus or minus about 10%. Time spent in jump has no relation to the distance travelled.

Equivalent Speed. A ship which jumps one parsec in one week travels 170 times the speed of light.

TRANSLATING JUMP TO LIGHT SPEED

Jump	Approximately:
1	160 to 180 x the speed of light
2	320 to 360 x
3	480 to 540 x
4	640 to 720 x
5	800 to 900 x
6	960 to 1000 x

Astrogation. A jump must be planned before it is executed; this planning is the duty of the astrogator. Planning a jump involved plotting a straight line course from the jump point to the breakout point.

Restrictions. Jump cannot proceed within 100 diameters of body (star, gas giant, world, planetoid, or even another ship) larger than itself.

If a plotted course intersects a 100 diameter sphere around any object larger than the ship, the ship is “precipitated out” of jump space.

In System Jumps. It is possible to jump within a star system: The jump still takes a week (168 hours or so). In some cases, the jump is more efficient than maneuver drive.

Jump Points

The location at which a ship enters jump space is called a **Jump Point.** There are technically an infinite number of Jump Points, but some are more efficient that others. Jump Points must meet certain criteria.

Outside the 100 Diameter Sphere. A jump point must be at least 100 diameters from every astral body (star, planet, gas giant, planetoid, or other object).

In Vacuum/ Space. By inference, a jump point which is outside the 100 diameter sphere is in vacuum.

POWERING THE JUMP DRIVE

Initiation requires a very large input of energy in a very short time period. Once in jumpspace, the energy to maintain jump is minimal. Transition back to real space requires no additional energy (and precipitation releases a blinding flash of energy [as neutrinos and photons]). A portion of the energy generated during jump initiation is retained in jumpspace.

Power Plants

Starship Power Plants are “small” fusion generators comparable to the standard plants used on world surfaces.

The key to their importance is called *Overclock* capability. A ship Power Plant can increase its output by several orders of magnitude for a period of seconds, with great inefficiency. This ability even makes normal operation relatively inefficient, with fuel usage measured in tons per week rather than tons per year. In addition, each use of Overclock increases the chance of failure (which is why starship Power Plants require annual maintenance).

First Imperium Power Plants. When the First Imperium developed jump drive, its ships had power plants with OverClock=15, barely enough to make Jump-1 work. A 1000-ton Jump-1 ship had barely 30 tons cargo capacity after filling the hull with an inefficient power plant and fuel tankage. Most ships were 2000 tons or larger.

Later Power Plants. Improvements in Overclock were the primary basis for smaller ships, for greater Jump capability, and for larger cargo capacity.

Around -5430, technological advances in OverClock achieved OC=25 and made J-2 possible. This jump superiority marked the start of the Consolidation Wars to exterminate competing technologies.

OVERCLOCK EXAMPLES

Hull	TL	OC	J	P	J-Fuel	J-Fuel%	Free Tons*
1000		10	55	310	1,000	100%	- 365
1000		15	55	207	667	67%	72
1000	9	20	55	155	500	50%	290
1000		25	55	124	400	40%	421
1000		30	55	103	333	33%	508
1000		35	55	89	286	29%	571
1000	10	40	55	78	250	25%	618
1000		45	55	69	222	22%	654
1000		50	55	62	200	20%	683
1000		55	55	56	182	18%	707
1000	11	60	55	52	167	17%	727
1000		65	55	48	154	15%	743
1000		70	55	44	143	14%	758
1000		75	55	41	133	13%	770
1000		80	55	39	125	13%	781
1000		85	55	36	118	12%	791
1000	12	90	55	34	111	11%	799
1000		95	55	33	105	11%	807
1000	**13**	**100**	**55**	**31**	**100**	**10%**	**814**
1000	14	110	55	30	95	9%	820
1000	15	120	55	26	83	8%	836
1000	17	140	55	22	71	7%	851
1000	18	160	55	19	63	6%	863
1000	21	180	55	17	56	6%	872
1000		200	55	16	50	5%	880

* Free Tons= tons available for all other functions including maneuver, weapons, quarters, and cargo.

OC=100 is the standard available.

Look through this table: as Overclock increases, Power Plant size decreases and the required Jump Fuel percentage decreases.

Overclock Rates are Historical. Within an era or milieu or culture, the same Overclock Rate predominates regardless of Technology Level.

The Fantastic Drive

The very high-tech alternatives to Jump Drive (the Hop Drive and the Skip Drive) may very occasionally be encountered. They are forms of Jump Drive, and where Jump is used, generally Hop or Skip may be substituted.

Starship Design and Construction

Starships are designed and constructed for specific missions: naval, exploratory, trade, research. The process of design and construction (Naval Architecture) carries the architect through a series of steps which identify ship component requirements and address them.

Ship design is a continuous feedback process: each step seems to mandate changes in what had been decided before. Eventually, however, the ship design appears complete and can be finalized with a ship name.

ACS ADVENTURE CLASS SHIPS

Adventure Class ships are starships and spacecraft suitable for use by groups of player characters. The ships are large enough to carry profitable cargos but small enough that the activities of the individual characters matter.

Tonnages. Adventure Class Ships are built using standard hulls between 100 tons and 2400 ton displacement.

Ships smaller than 100 tons are Small Craft; ships larger than 2400 tons are BCS Battle Class Ships.

Drag And Drop Components. The components for ACS ships are standardized for selection from tables (as opposed to created by formulas or percentages as in BCS ships).

THE NAVAL ARCHITECTURE PROCESS

Starships are designed based on a mission: the specific need for the ship, whether it be commercial, military, scientific, or recreational.

Designed in Tons. Ships are designed in Tons which then easily translate into deck plan squares and into volumetric cubes.

Costs in MegaCredits. Ship component costs are expressed in MegaCredits, Design decisions with considerably smaller costs (the fabrics for interior upholstery) are ignored.

An Interactive Process. The design charts are an interactive process: changing one parameter may require other changes throughout the design.

The process also interacts with other systems within **Traveller:** the combat system, the trade system, and various environmental details may influence the system.

THE COMPONENTS OF A STARSHIP

A starship consists of a variety of components, each with its own particular benefit and requirements.

The Hull. The starship hull is the container into which all other components must be fitted. The hull has a size (in tons) and is further defined by its Configuration (shape and streamlining).

Drives. Every ship has a variety of drives providing power and the ability to move both between planets and between star systems.

Sensors. Each ship has a set of technological eyes and ears for exploring systems and detecting other ships.

Weapons. Ships may be armed for their own protection and to accomplish their missions.

Defenses. Ships may be equipped with a variety of defensive capabilities.

Armor. Even unarmed ships may be equipped with armor to protect them against attack, and against their environment.

Vehicles and Small Craft. It is inefficient for ships to travel to every possible destination within a system; they carry vehicles and small craft to carry crew on excursions and expeditions.

Computers. Ships cannot fulfill all their functions if crew were required to manage each set of controls constantly; each ship is equipped with a set of computers to handle the detail, tedium, and complexity of ship operation.

Software. The computers on a ship require software to actually perform the required functions.

Quarters. The crew and passengers on a ship require living and recreational accommodations.

Fittings. Miscellaneous details of ship operation must be handled with various fittings to allow landing and improve performance.

Describing A Ship

The goal of Naval Architecture is the creation of a starship which can be described by:

The Quick Ship Profile QSP. A short coded description of the mission and capabilities of the ship. The QSP may be elaborated upon by the Crew Extension (detailed the various crew members for the ship) and the Vehicle Extension (detailing the vehicles and small craft carried by the ship).

The ShipSheet. A form showing the components of the ship and which is used to record malfunctions or battle damage.

The FillForm. A form used to record the components as they are assigned to the ship.

DESIGNING A SHIP

The Design Charts 01 to 16 manage the Naval Architecture Process. Begin with Chart 01 (and its Checklist) and proceed through the process.

Ship Design Tech Levels. Ship design is based on common Tech Levels across most of interstellar society; the usual maximum is TL 15.

It is possible to encounter worlds with Tech Levels as high as 21; encountering such a world is an opportunity to acquire higher TL equipment.

01 THE CHECKLIST

The Starship Design Checklist provides an overview of the charts managing ship design.

Arv Dinsha is designing a Scout Ship. His decisions will illuminate the design process as it proceeds.

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02 THE FILLFORM

The Starship FillForm is the document which records the details of every component as it is chosen. The goal is a completed Fillform in which the total component tonnages fits into the hull and the costs do not exceed the ship budget (if any).

Ship Data. Information about the ship, including name, its home port, and its mission may be deferred until the design is complete.

Building Shipyard. Ships are built at Shipyards. The capabilities of the shipyard constrain the design decisions for ship construction.

The most important constraint is the shipyard Tech Level. Components for the ship are available at or less than the shipyard TL.

The FillForm Sections

The Fillform is divided into sections corresponding to each of the Design Charts. They may be completed in any order, but many of the sections depend on others, making the design process highly interactive.

Arv Dinsha will have his ship built at the General Shipyard at Regina A788899-C. The Tech Level of the ship will be C = 12.

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03 STARSHIP MISSIONS

Select the intended mission for the starship. This selection may be revisited based on the final results of the design.

Arv Dinsha has selected the mission for his ship as Type S Scout/Courier.

---

04 THE HULL

The foundation of the starship is the hull. Select a hull of appropriate tonnage and configuration. The challenge is to fit all of the desired components into the selected hull.

Configuration. Select a Configuration. Configuration determines many of the capabilities of the ship, including the ability to enter atmosphere.

Jump Readiness. Determine whether the ship's interstellar drive uses a jump bubble or a jump grid.

Configuration and Jump Readiness both play roles in the creation of the Hit Table later in this process.

The Bridge

Select the Bridge to install on the ship. The Bridge must be large enough to hold the command crew, sensors, and Ship's Computer.

Half of the Bridge tonnage must remain empty (for crew positions). The remaining half must be sufficient to hold a one-ton console for each installed sensor, and to hold the Ship's Computer.

Arv Dinsha selects a 100-ton hull. He wants to be able to enter atmospheres, but remain cost effective.

He selects Configuration-S Streamlined.

He selects Jump Readiness= Jump Bubble. This will require that he place Drives at Hit Location 0.

He selects the minimum available Half Bridge B1.

Hull-A Config-S = MCr3

Half Bridge B1 = MCr1, 10 tons.

---

05 DRIVES AND POWER PLANTS

Starship Hulls are just immobile shells unless they have proper drives.

Select an Interstellar (Jump) Drive.

Select an Interplanetary (Maneuver) Drive. In light of technology restrictions, a Gravitic Drive may be a better choice.

Select a Power Plant.

Drive Potential

Each Drive and Power Plant interacts with the Hull to process a Drive Potential Number which then dictates Drive Performance.

The Drive Potential for the Power Plant must equal or exceed the Drive Potential for the Jump Drive and for the Maneuver Drive.

Tech Level Restrictions. Drives availability is governed by Tech Level.

Arv Dinsha wants a high Jump capability. He reviews the Drive Potential Table and selects Jump-B; it has Drive Potential 4 (thus Jump-4) when installed in a Hull-A. The Power Plant needs to be at least Drive Potential-4 so he selects PPlant-B. Finally, he selects Maneuver-Drive-B.

But there's a potential problem. He consults Drive TL Two, which shows a PPlant-B in this hull is TL 11; an M-Drive is TL 9; and a J-Drive-B is TL 13.

He buys the Early Jump-B (one TL lower; QREBS 1 of 5; double cost). He could have selected J-Drive-A, but he wants the greater jump distance.

Jump Drive-B. MCr30. 15 tons.

Maneuver Drive-B. MCr6. 3 tons.

Power Plant-B. MCr

---

06 SENSORS

Select Sensors for the ship.

The number of available sensors is limited to the number of sensor consoles on the Bridge.

One option is to select a standard pre-designed Sensor Package.

Arv selects the Standard TL-12 Sensor Package. It requires three sensor consoles on the Bridge, but no additional tonnage.

A specific sensor can be designed.

Arv wants a Densitometer. His ship is TL 12. He selects Densitometer-10. The Stage Effects table shows he can upgrade it to Improved or Advanced, and the World Sensor Range Effects table shows he can increase its Range. He elects a bit of both: he increases Range from R=7 to R=8, and he selects the Improved Model. He keeps it as a Surface installation. His Densitometer is:

Imp Orbit Surf Densitomer-12

07 WEAPONS

Select the weapons for the ship. Since hulls have one weapons Hardpoint per 100 tons, this 100-ton hull has one Hardpoint and allows the installation of one weapon mount.

The options available for low tonnage hulls are few. Arv selects the Advanced Triple Turret Y hybrid mounting one each of L Beam Laser, S Sandcaster, and M Missile Launcher.

08 DEFENSES

Select defenses for the ship.

Although Arv will install Armor, he elects not to install any specific defenses (although the Sandcaster in his turret has some defensive capability).

09 ARMOR

Install Armor on the ship. Designate the first layer of Armor (which has no additional cost).

Armor can be installed in layers. Armor layers need not be all the same type.

Arv analyzes the available options at Tech Level. He selects the standard Charged-6 and installs two layers.

10 VEHICLES

Determine if the ship will carry any vehicles and how they will be transported.

Arv wants to carry a 4-ton Grav Flyer. For convenience and maximum flexibility, he installs 4 tons of cargo space to hold it.

11 COMPUTER

Determine the size and model of the Ship's Computer.

Arv analyzes the ship design to this point. Each Major Component has a Local Computer (= J-Drive, M-Drive, P-Plant), as does the weaponry (= Turret) and three Sensors (= Comm, Visor, Scanner). There are seven Local Model/2 computers distributed throughout the ship. For the Ship's Computer he selects another Model/2 and installs it in one of the two empty consoles on the Bridge.

It's a standard Imperial model with Architecture-4.

12 SOFTWARE

Select and install software for the ship.

Each Local and Ship's Computer requires a System process.

Each Local Computer requires an appropriate Component Process.

Finally, Service Processes must be selected and installed.

Arv installs Console XP in each Computer. It's cheap and fulfills his basic needs. The Local Computers come with the appropriate Component Processes; he leaves them as is.

He has seven Model/2 Local Computers, each with a System process and a Component process and two free cells. His Ship's Computer has three free cells, for a total 17 free cells.

He selects a variety of Service Processes: Life Support, Astrogation (he'll need that!), Medical, Entertainment, Maintenance, Damage Control, Accounting, Security, and Library Data, for a total of seven Service Processes. Since they won't all fit into the Ship's Computer, he distributes them one to each Local Computer.

Each of the Local Computers will be sluggish.

Processes in a Computer may provide it with the ability to resolve Tasks on its own.

13 QUARTERS

Determine the crew requirements for the ship and install quarters for them.

Arv's small ship requires a Pilot, and Astrogator, and an Engineer. He anticipates carrying more people at times, so he allocates tonnage for 8 people ((at 4 tons each = 32 tons). He allocates half the tonnage as staterooms and half as common areas.

14 FITTINGS

Allocate fittings for the ship.

Configuration-S provides Lifters and Landing legs automatically. Arv makes no changes.

Arv selects Flotation Hull.

Arv intends to venture beyond the borders of civilization; he selects Fuel Scoops and Fuel Purifier.

Arv notes the fuel tankage for the ship.

15 QUICK SHIP PROFILE

Create the Quick Ship Profile for basic identification of the ship's capabilities.

If the ship carries any vehicles, create a Vehicle Extension.

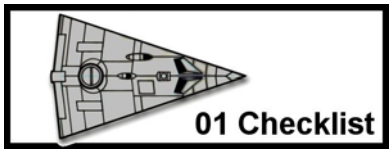
Create the Crew Extension to identify the required crew members.

16 THE SHIPSHEET

Create the ShipSheet for this ship. The ShipSheet records the location of the Major Components for use in combat or malfunction situations.

Starship Design Checklist

This Starship Design Checklist details starship design as a sequence of steps, each addressing a specific aspect of performance or operation.



ACS- ADVENTURE CLASS SHIPS

Starships are designed and produced in a variety of sizes.

The ACS Design System creates Adventure Class Ships-- starships and spacecraft with hulls from 100 tons to 2400 tons. Adventure Class Ships are reasonably capable of being used by adventurers.

The ACS Design System is a **drag-and-drop** system: specifically components are selected and installed in a hull and their interaction determines the performance of the ship.

ACS DESIGN

The Vilani method of Adventure Class Starship Design follows a detailed checklist step by step. Components are selected, their effect on tonnage and performance noted, and the final design evaluated for performance and cost.

The design process is interactive.

SHIPYARDS

Starships are constructed at shipyards, typically located at or near a starport.

Starport Type. Shipyards or construction facilities are present at type A or B starports.

Tech Level. The tech level of the craft being built is the tech level of the world on which it is built. It is possible to import components up to TL +2 at 150% of cost.

Surface or Orbital. Close Structures and Braced Structures may only be built in orbit.

All others may be built in orbit or on the world surface.

Other Design Systems

Two other spacecraft design systems are available.

Small Craft Design (a part of VehicleMaker) produces Small Craft: spacecraft generally smaller than 100 tons.

BCS Design creates Battle Class Ships-- starships and spacecraft with hulls greater than 2400 tons.

NAMING

Starships are named. Select an appropriate name for the ship. This step can be deferred until the end of the process.

Out Of. Ships are commonly registered with a starport authority somewhere. Out Of reflects the ships homeport.

STARSHIP DESIGN CHECKLIST

Use this checklist to control design of starships.

01. Checklist. This checklist.
02. Fillform. Create a blank Fillform for the ship.
03. Determine Mission

04. Select Hull.
- A. Configuration.
- B. Tonnage.
- C. Bridge.
- D. Jump Readiness.
- E. Note Hardpoints.

05. Drives.
- A. Drive1. Interstellar Drive
- B. Drive2. InSystem
- C. Drive3. Power Plant.
- D. Additional Drives.

05a. Drive Potential. Calculate Drive Performance.

06. Sensors.
- A. Sensors.
- B. Standard Sensor Packages.

07. Weaponry.
- A. Count Hardpoints and weapons mounts.
- B. Main Weapon.
- C. Additional Weapons and Installations.

08. Defenses.
- A. Assign Defense installations.

09. Armor.
- A. Determine Armor composition and values.
- B. Assign Armor overlays.

10. Vehicles and Small Craft.
- A. Small Craft
- B. Vehicles.
- C. Hangars and Docking Rings

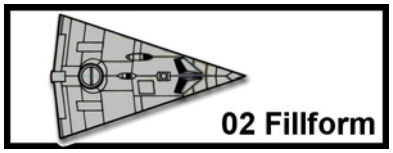
11. Computers.
- A. Determine Required and Add On Processes.
- B. Assign local Brains as needed.
- C. Assign Networks.

12. Quarters
- A. Life Support.
- B.

13. Fittings
14. QSP and Extensions
15. ShipSheet

Starship Fill Form

As the ship is designed insert the design values and details into this Fillform. Values may be inserted in any order as the design is considered: the ultimate requirement is that the values balance and properly reflect the charts and tables.



SHIP

Ship Name		Out Of		
03	**03.** Mission	QSP	Cx	Vx

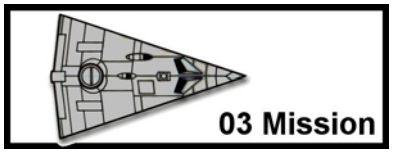
BUILDING SHIPYARD

Construction World	Date Built
Surface or Orbital?	Designer

Section	Component	Comment			Code	Crew	Proc	Tons	Sq		Cost	,000	,000
04 Hull	Hull	Config=											
	Bridge												
	Jump Readiness												
05 Drives	Drive1- Interstellar			J=									
	Drive2- InSystem			M=									
	Drive3- Power Plant			P=									
	Drive4-												
06 Sensors	Sensor1-												
	Sensor2-												
	Sensor3-												
	Sensor4-												
	Sensor5-												
	Sensor6-												
	Sensor7-												
	Sensor8-												
	Sensor9-												
07 Weapons	Main Weapon												
	Hardpoint2												
	Hardpoint3												
	Hardpoint4												
	Hardpoint5												
08 Defenses	Hardpoint6												
	Hardpoint7												
	Hardpoint8												
	Hardpoint9												
09 Armor	Base Armor												
	Layers												
	Overlay-1												
	Overlay-2												
10 Vehicles	SmallCraft1												
	SmallCraft2												
	Vehicle1												
	Vehicle2												
11 Computers	Main Computer												
	Brains												
12 Quarters	Astrogator=	Pilot=	Engineer=										
	Sensor Tech=	Gunner=	Steward=										
	Counsellor=	Troops=	Freightmaster=										
	Medic=												
	High=	Mid=	Low=										
13 Fittings	Fuel1-	Config=	Landing Gear=										
	Fuel2-	Wings=	Flotation=										
	Fuel3-	Fuel Scoops=	Purifiers=										
	Fuel4-												

Starship Missions

Starships are designed to accomplish missions. This standard list of missions covers most of the reasonable uses for which starships are created. Select a mission for the ship (or select a mission after the ship is designed).



ADVENTURE CLASS SHIP TYPES

Anglic Code	Vilani Code	Description
A	𒀸	Trader.
B	𒀹	Bulk Carrier.
C	𒀺	Cruiser (equal guns and armor)
D	𒀻	Defender.
E	𒀼	Escort.
F	𒀽	Freighter.
G	𒀾	Frigate (more guns than armor).
H	𒀿	
I	𒁀	
J	𒁁	Prospector
K	𒁂	Safari. Excursion. Expedition.
L	𒁃	Laboratory
M	𒁄	Liner
N	𒁅	Scientific / Medical
O	𒁆	
P	𒁇	Corsair. Pirate. Raider.
Q	𒁈	Small Craft (prefix)
R	𒁉	Merchant.
S	𒁊	Scout/Courier
T	𒁋	Military Transport
U	𒁌	
V	𒁍	Corvette (fast Frigate)
W	𒁎	Vehicle (prefix)
X	𒁏	Express. Messenger. Courier.
Y	𒁐	Yacht
Z	𒁑	Unclassified

Anglic Code	Alternate Anglic	Vilani Code	Description
A2	AA	𒀸𒁹	Far Trader
B2	BH	𒀹𒁹	Enhanced Bulk Carrier
C2	CH	𒀺𒁹	Enhanced Cruiser
D2	DH	𒀻𒁹	Uparmored Defender (Turtle)
E2	EE	𒀼𒁹	Enhanced Escort
F2	FH	𒀽𒁹	Specialized Freighter
G2	GH	𒀾𒁹	Upgunned Frigate
I2	II	𒁀𒁹	
J2	JH	𒁁𒁹	
K2	KH	𒁂𒁹	Long Range Expedition
L2	LH	𒁃𒁹	
M2	MM	𒁄𒁹	Subsidized Liner
N2	MH	𒁄𒁹	
O2	OO	𒁆𒁹	
P2	PH	𒁇𒁹	Enhanced Raider.
R2	RH	𒁉𒁹	Enhanced Merchant
S2	SH	𒁊𒁹	Enhanced Scout/Courier
T2	TH	𒁋𒁹	Enhanced Transport
U2	UU	𒁌𒁹	
V2	VV	𒁍𒁹	Enhanced Corvette
W2	WW	𒁎𒁹	
X2	XH	𒁏𒁹	Alternate Courier
Y2	YY	𒁐𒁹	Enhanced Yacht.
Z2	ZH	𒁑𒁹	Alternate Unclassified

MISSION CODES

ACS Adventure Class Ships Mission Codes apply to ships with hulls from 100 to 2400 tons, and to small craft 10 to 100 tons.

Single letter codes reflect basic ship missions: for example, a Type A Free Trader.

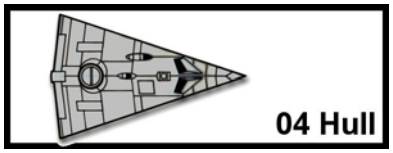
Two letter codes reflect (various) concepts such as Enhanced, Alternate, Upgunned, Uparmored, or Specialized versions of the mission. For example, a Type R2 or RH Enhanced Merchant.

Q0	𒁈𒁰	Pod. Gig. Lifepod.
Q1	𒁈𒁱	Fighter.
Q2	𒁈𒁲	Launch.
Q3	𒁈𒁳	Ship's Boat.
Q4	𒁈𒁴	Pinnace.
Q5	𒁈𒁵	Cutter.
Q6	𒁈𒁶	LR Fighter
Q7	𒁈𒁷	Picket.
Q8	𒁈𒁸	Tanker
Q9	𒁈𒁹	Shuttle.

QG	
QF	
QL	
QB	
QP	
QC	
QR	
QK	
QT	
QS	

Starship Hulls

The Hull is the basic container for the contents of a starship. The challenge is to fill all required (and desired) components within the hull tonnage limitation.



HULL SIZES

Hulls are built in standard 100 ton increments ranging from 100 to 2400 tons.

HULL COSTS----------	Configuration Costs MCr----------							Total	Total		
	Tons	C	B	U	S	A	L	Squares	Cubes	A	B
A	100	1	2	2	3	4	4	200	400	2	10
B	200	4	6	8	10	12	16	400	800	2	10
C	300	6	8	12	15	18	24	600	1200	2	20
D	400	8	11	16	20	24	32	800	1600	2	20
E	500	15	20	30	35	40	60	1000	2000	3	20
F	600	24	32	48	54	60	96	1200	2400	3	20
G	700	32	43	64	71	78	128	1400	2800	3	20
H	800	40	54	80	88	96	160	1600	3200	3	20
J	900	45	60	90	99	108	180	1800	3600	4	20
K	1000	50	67	100	110	120	200	2000	4000	4	30
L	1100	55	74	110	121	132	220	2200	4400	4	40
M	1200	60	80	120	132	144	240	2400	4800	4	40
N	1300	65	87	130	143	156	260	2600	5200	5	40
P	1400	70	93	140	154	168	280	2800	5600	5	40
Q	1500	75	100	150	165	180	300	3000	6000	5	40
R	1600	80	107	160	176	192	320	3200	6400	5	40
S	1700	85	114	170	187	204	340	3400	6800	6	40
T	1800	90	120	180	198	216	360	3600	7200	6	40
U	1900	95	127	190	209	228	380	3800	7600	6	40
V	2000	100	134	200	220	240	400	4000	8000	6	60
W	2100	105	140	210	231	252	420	4200	8400	7	60
X	2200	110	147	220	242	264	440	4400	8800	7	60
Y	2300	115	154	230	253	276	460	4600	9200	7	60
Z	2400	120	160	240	264	288	480	4800	9600	7	60

Hull I and O are omitted to avoid confusion with 1 and 0.

STARSHIP TONS

Hulls are measured in Tons: displacement tons equal to 13.5 cubic meters.

One ton allows two deck plan squares when creating deck plans (with a 3 meter deck separation).

Configuration Costs

Hull costs in the table are pre-calculated based on the Configuration Cost formulas below..

Configuration Costs (in MCr)

C= U / 2
B= U / 1.5
U= Base Cost
S= U + MCr1 per 100 tons
A= U + MCr2 per 100 tons
L= U x 2

Squares= Expected Deck Plan squares (1.5 meters square) for this hull size.

Cubes= Expected cubes (1.5 meters on a side) for this hull size.

A= armor tons per layer (after the first).

B= minimum Bridge tons.

Hardpoints. Hull automatically has one Hardpoint per 100 tons.

CONFIGURATION

	Type	Gs	Atm	Skim	Land	Comment
C	Cluster	1	No	No	No	An accumulation of compartments.
B	Braced	3	No	No	No	A Cluster braced for higher acceleration.
U	Unstreamlined	9	No	Yes	No*	An enclosure whose protrusions increase drag.
S	Streamlined	9	Yes	Yes	Yes	An enclosure with cowlings and farings to decrease drag.
A	Winged Streamlined	9	Yes	Yes	Yes	A winged enclosure with better performance in atmosphere.
L	Lifting Body	9	Yes	Yes	Yes	An enclosure with lifting surfaces for best performance.

Gs= Maximum acceleration possible. Atm= Can the ship enter Atmosphere 2+?
Skim= Can the ship skim Gas Giants for Fuel? Land= Can the ship land on a world surface (*= yes if Atm 0 or 1)?

JUMP READINESS

	Type	Available	Comment	Cost
X	Jump Bubble	Standard	Jump Field centered on Jump Drive.	No Cost
Y	Jump Grid	Option for Config-USAL	Jump Field conforms to the Hull.	Hull Tons x KCr

BRIDGE

	Type	Crew	Tons	Cost
B1	Half Bridge	3	10	MCr1
B2	Bridge	4	20	MCr1
B3	Expanded Bridge	6	30	MCr2
B4	Double Bridge	10	40	MCr3
B5	Triple Bridge	14	50	MCr4

The Bridge is the control center for the ship and contains the primary crew operating positions for a starship.

Bridge Contents. The Bridge contains the Ship's Computer and a 1-ton console per installed Sensor.

Half of Bridge Tonnage remains open for crew and free space.

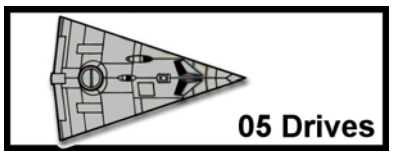
The minimum Bridge required is shown on the Hulls Table.

Auxiliary Bridge. More than one Bridge may be installed.

Starship Drives

The drives for a ship determine its ability to move and maneuver.

Select the Interstellar (J) drive, the Interplanetary (M, G) drive, and the Power Supply (P).



DRIVE TONNAGE

Drive Letter	Rating EP	J J-Drive	M M-Drive	P P-Plant	G G-Drive
A	100	10	2	4	9
B	200	15	3	7	18
C	300	20	5	10	27
D	400	25	7	13	36
E	500	30	9	16	45
F	600	35	11	19	54
G	700	40	13	22	63
H	800	45	15	25	72
J	900	50	17	28	81
K	1000	55	19	31	90
L	1100	60	21	34	99
M	1200	65	23	37	108
N	1300	70	25	40	117
P	1400	75	27	43	126
Q	1500	80	29	46	135
R	1600	85	31	49	144
S	1700	90	33	52	153
T	1800	95	35	55	162
U	1900	100	37	58	171
V	2000	105	39	61	180
W	2100	110	41	64	189
X	2200	115	43	67	198
Y	2300	120	45	70	207
Z	2400	125	47	73	216
N2	2600	140	50	80	234
P2	2800	150	54	86	252
Q2	3000	160	58	92	270
R2	3200	170	62	98	288
S2	3400	180	66	104	306
T2	3600	190	70	110	324
U2	3800	200	74	116	342
V2	4000	210	78	122	360
W2	4200	220	82	128	378
X2	4400	230	86	134	396
Y2	4600	240	90	140	414
Z2	4800	250	94	146	432

DRIVE COSTS

Drive	Cost per Ton
Jump Drive	MCr 1.0
Maneuver Drive	MCr 2.0
Power Plant	MCr 3.0
Gravitic Drive	MCr 0.5

Drive TL One Table. Lookup maximum output potential for a drive by Tech Level.

* Maneuver Drive is further restricted by Power Plant availability.

Drive TL Two Table. Lookup TL by Drive Potential.

DRIVE TL ONE

TL	J	M	P	G
8	-		1	4
9	1	4*	2	7
10	1	7*	3	9
11	2	9*	4	-
12	3	-	5	-
13	4	-	6	-
14	5	-	7	-
15	6	-	8	-
16	6	-	9	-
17	7	-	-	-
18	7	-	-	-
19	8	-	-	-
20	8	-	-	-
21	9	-	-	-

THE BASIC DRIVES

The basic available drives are:

Jump Drive. The interstellar drive. Jumps are measured in parsecs; one Jump (regardless of distance) requires one week.

A Jump Drive requires 10% of Hull Tonnage per Jump number (subject to PPlant Overclock). A Jump Drive can perform any length Jump up to its maximum Potential.

Maneuver Drive. Performance is measured in Gs (= 10 meters per second per second). Because it interacts with gravity sources, it must be within 1000 D of a gravity source (beyond 1000 D, it operates at 1% Performance).

Requires a supporting Power Plant.

Power Plant. A Fusion Power Generator with OverClock capabilities. A Power Plant requires 1 ton of fuel times Drive Potential times Hull Number per week to support normal operations.

Gravitic Drive. A near-world drive. Performance is measured in Gs. Because it interacts with gravity sources, it must be within 10 D of a gravity source.

G-Drive includes an integral Power Source.

DRIVE POTENTIAL

Each Drive has a Potential (an Output Rating) based on the interaction of Drive Tonnage and Hull Tonnage. Drive Potential is calculated from the Drive Potential Table and influences fuel usage and ship performance.

STAGE EFFECTS

	Stage	TL	QREBS	OC	Tons	Cost
Ex	Experimental*	- 3	Full	50	x3	x10
Pr	Prototype**	- 2	3 of 5	80	x2	x3
Er	Early	- 1	1 of 5	90		x2
	(Standard)	+0		100		
Im	Improved	+1	+1 of 5	110		
Ad	Advanced	+2	+3 of 5	120		

OC= Overclock (for Power Plants only; ignore Tons).

OVERCLOCK

Overclock is a measure of the efficiency of a Power Plant. A standard Power Plant operates with Overclock= 100 for Potential based on Tech Level. Power Plants at other TLs have different Overclock. Overclock affects Power Plant tons and Jump Fuel tons.

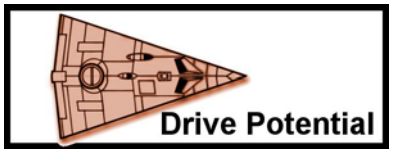
True Power Plant tons = P- Plant Tons / (OC/100)
True Jump Fuel tons= Fuel / (OC/100)

DRIVE TL TWO

	Potential=	1	2	3	4	5	6	7	8	9
M	M-Drive	9	9	9	9	10	10	10	11	11
G	G-Drive	8	8	8	8	9	9	9	10	10
P	P-Plant	8	9	10	11	12	13	14	15	16
J	J-Drive	9	11	12	13	14	15	17	19	21

Drive Potential

Drive Potential determines the performance of drives, and is dependent on an interaction between the drive and the hull.



DRIVE POTENTIAL-1 Determine Drive Potential (in table body) for a Drive (left column) installed in a Hull (top row).

Drive= \ Hull=	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z	
A	2	1	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	A
B	4	2	1	1	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	B
C	6	3	2	1	1	1	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	C
D	8	4	2	2	1	1	1	1	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	D
E	9	5	3	2	2	1	1	1	1	1	no	no	no	no	no	no	no	no	no	no	no	no	no	no	E
F	9	6	4	3	2	2	1	1	1	1	1	1	no	no	no	no	no	no	no	no	no	no	no	no	F
G	9	7	4	3	2	2	2	1	1	1	1	1	1	1	no	no	no	no	no	no	no	no	no	no	G
H	9	8	5	4	3	2	2	2	1	1	1	1	1	1	1	1	1	no	no	no	no	no	no	no	H
J	9	9	6	4	3	3	2	2	2	1	1	1	1	1	1	1	1	1	1	1	no	no	no	no	J
K	9	9	6	5	4	3	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	no	K
L	9	9	7	5	4	3	3	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	L
M	9	9	8	6	4	4	3	3	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	M
N	9	9	8	6	5	4	3	3	3	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	N
P	9	9	9	7	5	4	4	3	3	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	P
Q	9	9	9	7	6	5	4	3	3	3	2	2	2	2	2	2	2	1	1	1	1	1	1	1	Q
R	9	9	9	8	6	5	4	4	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1	1	R
S	9	9	9	8	6	5	4	4	4	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1	S
T	9	9	9	9	7	6	5	4	4	3	3	3	3	2	2	2	2	2	2	1	1	1	1	1	T
U	9	9	9	9	7	6	5	4	4	3	3	3	3	3	2	2	2	2	2	1	1	1	1	1	U
V	9	9	9	9	8	7	6	5	4	4	3	3	3	3	3	2	2	2	2	2	1	1	1	1	V
W	9	9	9	9	8	7	6	5	5	4	4	3	3	3	3	3	2	2	2	2	2	1	1	1	W
X	9	9	9	9	8	8	7	6	5	5	4	4	3	3	3	3	3	2	2	2	2	2	1	1	X
Y	9	9	9	9	9	8	7	6	6	5	5	4	4	3	3	3	3	2	2	2	2	2	2	1	Y
Z	9	9	9	9	9	9	8	7	6	6	5	5	4	4	3	3	3	3	2	2	2	2	2	2	Z
N2	9	9	9	9	9	9	9	8	7	6	6	5	5	4	4	3	3	3	3	3	2	2	2	2	N2
P2	9	9	9	9	9	9	9	9	8	7	6	6	5	5	4	4	3	3	3	3	3	2	2	2	P2
Q2	9	9	9	9	9	9	9	9	9	8	7	6	6	5	5	4	4	3	3	3	3	3	2	2	Q2
R2	9	9	9	9	9	9	9	9	9	9	8	7	6	6	5	5	4	4	3	3	3	3	3	2	R2
S2	9	9	9	9	9	9	9	9	9	9	9	8	7	6	6	5	5	4	4	3	3	3	3	3	S2
T2	9	9	9	9	9	9	9	9	9	9	9	9	8	7	6	6	5	5	4	4	3	3	3	3	T2
U2	9	9	9	9	9	9	9	9	9	9	9	9	9	8	7	6	6	5	5	4	4	3	3	3	U2
V2	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	7	6	6	5	5	4	4	3	3	V2
W2	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	7	6	6	5	5	4	4	3	W2
X2	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	7	6	6	5	5	4	4	X2
Y2	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	7	6	6	5	5	4	Y2
Z2	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	7	6	6	5	5	Z2

no= not possible. Grey 9= Drive is possible with but smaller ones are more efficient.

For example, Jump Drive-A in Hull-A produces a Jump Drive Potential= 2. The Jump Drive can achieve Jump-2. Maneuver Drive-H in Hull-E produces Maneuver Drive Potential = 3. The Maneuver Drive can achieve 3 G acceleration.

DRIVE POTENTIAL-2 Determine the Drive (in table body) for a specific Potential (left column) for a Hull (top row).

Potential= \ Hull=	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z	Pot
1	A	A	B	B	C	C	D	D	E	E	F	F	G	G	H	H	H	J	J	J	K	K	K	L	1
2	A	B	C	D	E	F	G	H	J	K	L	M	N	P	P	Q	Q	S	T	V	W	X	Y	Z	2
3	B	C	E	F	H	J	J	M	N	Q	R	S	T	U	V	W	X	Z	N2	N2	P2	R2	R2	S2	3
4	B	D	F	H	K	M	P	R	S	V	W	X	Y	Z	N2	P2	Q2	R2	S2	T2	U2	V2	W2	X2	4
5	C	E	H	K	N	Q	T	V	W	X	Y	Z	N2	P2	Q2	R2	S2	T2	U2	V2	W2	X2	Y2	Z2	5
6	C	F	J	M	Q	T	V	X	Z	Z	N2	P2	Q2	R2	S2	T2	U2	V2	W2	X2	Y2	Z2	no	no	6
7	D	G	L	P	T	V	X	Z	N2	P2	Q2	R2	S2	T2	U2	V2	W2	X2	Y2	Z2	no	no	no	no	7
8	D	H	M	R	V	X	Z	N2	P2	Q2	R2	S2	T2	U2	V2	W2	X2	Y2	Z2	no	no	no	no	no	8
9	E	J	P	T	Y	Z	N2	P2	Q2	R2	S2	T2	U2	V2	W2	X2	Y2	Z2	no	no	no	no	no	no	9

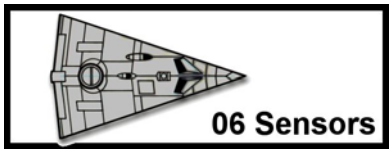
no= not possible.

For example, achieving Jump-6 in a 1000-ton Hull-K requires Jump-Drive-Z. The maximum Potential available for a Hull-R is achieved with a Z2 Drive in row 8 = Potential 8.

Regardless of the Potential on these tables, the actual output of a drive is restricted by its construction Tech Level.

Sensors

Sensors are the eyes and ears of the ship, or of explorers. They gather information and present it to users in an understandable form. Create sensors as needed from this page.



SENSOR DESCRIPTION

Model	LongName = Stage Range Mount Type -TL (C+S)

The basic information required to describe and use a sensor.

IDENTIFYING SPACE SENSORS

R= or S=
Stage Range Mount Type -TL (C+S)

Early DS Ant Radar -9 (10)

THE SENSOR TASK

TL Char Skill Mod

nD < T +C +S +M

n = Range — Uncertain (1D)

Use: C4 C5 — Use: Sensor — Passive Benchmark Mount

SPACE SENSORS

	Type	TL	Mount	S=	R=	MCr
A	Activity Sensor	11	Surf		7	0.1
B	Deep Radar	9	Surf		7	0.1
C	Communicator	8	Surf	7		1.0
D	Densitometer	10	Surf		7	0.1
E	EMS	12	Ant	7		1.0
F	Field Sensor	12	Surf		7	0.1
G	Grav Sensor	13	Surf	7		1.0
H	HoloVisor	18	Surf	7		1.0
J	Jammer	8	Surf	7		1.0
K	Analyzer / Sniffer	9	Surf		7	0.1
L	Life Detector	10	Surf		7	0.1
M	Mass Sensor	8	Surf		7	0.1
N	Neutrino Detector	10	Surf	7		1.1
P	Proximeter	10	Surf		7	0.1
Q	Stealth Mask	12	Surf	7		1.0
R	Radar	9	Ant	7		1.0
S	Scanner	19	Ant	7		1.0
T	Scope	9	Surf	7		1.0
V	Visor	14	Surf	7		1.0
U						
W	CommPlus	17	Surf	7		1.0
X						
Y	Sound Sensor	10	Surf		7	0.1
Z						

SENSOR MOUNTS

	Mount Type	Tons	Mod	Skill	MCr
T1	Turret	1	0	Sensor	0.2
B1	Barbette	3	+1	Sensor	3.0
De	Deployable	+2		Sensor	3.0
Bay	Bay	50	+5	Sensor	5.0
LBay	Large Bay	100	+8	Sensor	10.0
M	Main	200	+10	Sensor	20.0
Surf	Surface	0	0	Sensor	0.0
(blank)	Surface	0	0	Sensor	0.0
Ant	Antenna	1	+1	Sensor	0.5
Ext	Extendable	2	+3	Sensor	1.0

Sensors may be installed in weapon **Hardpoints** or in Sensor Mounts. Surface, Antenna, or Extendable.

Deployable. In addition to Turret or Barbette costs.

STAGE EFFECTS **(applies to Sensor)**

	Stage	TL	QREBS	Mod	Tons	Cost
Ex	Experimental*	- 3	Full	-4	+3	x10
Pr	Prototype**	- 2	3 of 5	-3	+2	x3
Er	Early	- 1	1 of 5			x2
	(Standard)	+0				
Im	Improved	+1	+1 of 5			/ 2
Ad	Advanced	+2	+3 of 5	+1		/ 2

Tons in addition to 1-ton Bridge Console; may be anywhere.

C+S CHARACTERISTIC PLUS SKILL

Characteristic Use C4 or C5.
Skill Use Skill= Sensors.

SPACE SENSOR RANGE EFFECTS **(applies to Mount)**

S=		Range	TL	R=	Tons	Cost
2	**FR**	Fighter Range	- 2	7	/3	/2
5	**SR**	Short Range	- 1	10	/2	/2
7	**AR**	Attack Range	0	12		
9	**LR**	Long Range	+1	14	+1	x3
12	**DS**	Deep Space	+2	17	+2	x5

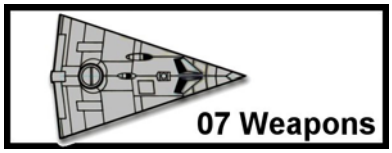
WORLD SENSOR RANGE EFFECTS **(applies to Mount)**

R=		Range	TL	S=	Tons	Cost
5	**L**	Long 1000 m	- 2	B	/3	/2
6	**D**	Distant 5 km	- 1	1	/2	/2
7	**Vd**	Vdistant 50 km	0	2		
8	**Or**	Orbit 500 km	+1	3	x2	x3
9	**Fo**	Far Orbit 5000 km	+2	4	x3	x5
10	**G**	Geo 50,000 km	+3	5	x4	x8

Each Sensor requires a 1-ton Console on the Bridge (which also holds its Local Computer) which is not part of the Sensor tonnage. Stage and Range Effects do not apply to Mounts.

Space Weapons

Space weapons are the offensive tools of starships and spacecraft. They are produced in a variety of types and tech levels. Create weapons as needed from this page.



SPACE WEAPON DESCRIPTION

Model	LongName = Stage Range Mount Type-TL (C+S)

The basic information required to describe and use a space weapon.

IDENTIFYING SPACE WEAPONS

R= or S=

Stage Range Mount Type -TL (C+S)

Adv LR T1 Msl -11 (10)

SPACE WEAPON TYPES

	Space Weapon	TL	Minimum	R=	S=	MCr
A	Particle Accelerator	11	Barbette	7*	7*	2.5
B	Slug Thrower	9	Turret	7		
C	CommCaster	8	Turret		7	
D	DataCaster	10	Turret	7		
E	Stasis	19	Turret	7		
F	Fusion Gun	12	Barbette	7		1.5
G	Meson Gun	13	Main		7	5.0
H	Inducer	18	Turret	7		
I	--- not used ---					
J	Mining Laser	8	Turret	7		0.5
K	Pulse Laser	9	Turret	7		1.0
L	Beam Laser	10	Turret	7		0.5
M	Missile	8	Turret		7	0.2
N	KK Missile	10	Bay		7	3.0
O	--- not used ---					
P	Plasma Gun	10	Barbette	7		1.0
Q	Ortillery	12	Bay	7		
R	Rail Gun	12	Bay		5	
S	SandCaster	9	Turret	7		0.1
T	Jump Damper	14	Barbette	7		
U	Tractor/Pressor	15	Barbette	7		
V	Salvo Rack	10	Bay		7	
W	Disruptor	17	Barbette	7		
X	Hybrid K-S-M	9	Triple Turret*	7		1.5
Y	Hybrid L-S-M	10	Triple Turret*	7		1.0
Z						

Minimum= minimum required mount for this weapon.
* Particle Accelerator uses S= in Space Attacks.
* Only available in this Mount.

C+S CHARACTERISTIC PLUS SKILL

Char	Use C4 or C5.
Skill	Use Skill= Gunner plus Knowledge= Turrets, Bays, Ortillery, or Spines (includes Main). Nuclear Missiles requires Heavy Weapons + WMD in place of any other Skills/Knowledges.

SPACE WEAPON MOUNTS

	Mount Type	Tons	Mod	Hits	Skill	MCr
T1	Single Turret	1	- 3	1	Turret	0.2
T2	Dual Turret	1	- 2	2	Turret	0.5
T3	Triple Turret	1	- 1	3	Turret	1.0
T4	Quad Turret	1		4	Turret	1.5
B1	Barbette	3	0	3	Turret	3.0
B2	Dual Barbette	3	+2	5	Turret	4.0
De	Deployable	+2			Turret	3.0
Bay	Bay	50	+5	10	Bay*	5.0
LBay	Large Bay	100	+8	20	Bay*	10.0
M	Main	200	+10	30	Spine	20.0
S	Spine	Not available for ACS ships.				

*Ortillery and Rail Gun governed by Skill= Ortillery.
Hardpoints. One mount per 100 tons of ship.
Deployable. In addition to Turret or Barbette costs.

STAGE EFFECTS **(applies to Weapon)**

	Stage	TL	QREBS	Mod	Tons	Cost
Ex	Experimental*	- 3	Full	-4	+3	+10
Pr	Prototype**	- 2	3 of 5	-3	+2	+3
Er	Early	- 1	1 of 5			+2
	(Standard)	+0				
Im	Improved	+1	+1 of 5			
Ad	Advanced	+2	+3 of 5	+1		

Install added tons adjacent to the Mount.

WEAPON RANGE EFFECTS S= **(applies to Mount)**

S=		Range	TL	Tons	Cost
2	**FR**	Fighter Range	- 2	/3	/2
5	**SR**	Short Range	- 1	/2	/2
7	**AR**	Attack Range	0		(standard)
9	**LR**	Long Range	+1	x2	x3
12	**DS**	Deep Space	+2	x3	x5

Applies to Bays, Large Bays, and Mains

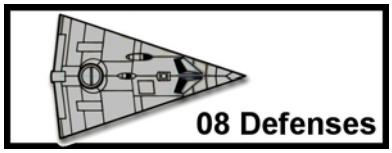
WEAPON RANGE EFFECTS R= **(applies to Mount)**

R=		Range	TL	Tons	Cost
5	**Vl**	Vlong 1000 m	- 2	/3	/2
6	**D**	Distant 5 km	- 1	/2	/2
7	**Vd**	Vdistant 50 km	+0		(standard)
8	**Or**	Orbit 500 km	+1	x2	x3
9	**Fo**	Far Orbit 5000 km	+2	x3	x5
10	**G**	Geo 50,000 km	+3	x4	x8

Applies to Turrets and Barbettes

Space Defenses

Space defenses are creates to reduce or stop the effects of space weapons. Like space weapons, they are produced in a variety of types and tech levels. Create defenses as needed from this page.



SPACE DEFENSE DESCRIPTION

Model	LongName = Stage- Defense -TL (C+S)

The basic information required to describe and use a space defense.

IDENTIFYING SPACE DEFENSES

Stage	Defense	-TL	(C+S)
Imp	**Nuclear Damper**	**-11**	**(10)**

SPACE DEFENSES

	Space Defenses	TL	Absolute Mode vs	MCr
G	Meson Screen	11	G	1.0
N	Nuclear Damper*	12	Nukes	1.0
Q	Mag Scrambler	14	E Magnetics	1.0
R	Proton Screen	19	AM	1.0
T	Black Globe	16	-all-	4.0
U	White Globe	20	-all (except D)	10.0
W	Grav Scrambler	17	H T Gravitics	2.0
Z				

* Nuclear Damper requires TWO separate Mounts.
** Vs Weapon (but not its fire).

SPACE DEFENSE MOUNTS

	Mount Type	Tons	Mod	Skill	MCr
In	Internal	1	+1	Screens	0.5
Bo	Bolt-In	2	-1	Screens	0.5
	Console	1		Screens	0.0

Each Absolute Mode Defense requires an Internal or Bolt-In Mount (anywhere in the ship) and a Console (on the Bridge).

SPACE WEAPONS DEFENSE MODE

		Space Defenses	TL	Mode	Skill
>	**B**	Slug Launcher	9	AM	Use: Weapon Mount skill, or may use Screens
>	**D**	DataCaster	10	AM	
>	**F**	Fusion Gun	12	AM	
>	**J**	Mining Laser	8	AM	
>	**K**	Pulse Laser	9	AM	
>	**L**	Beam Laser	10	AM	
>	**M**	Missile	8	AM	
>	**P**	Plasma Gun	10	AM	
>	**S**	SandCaster	9	AB	
>	**V**	Salvo Rack	10	AM	
>	**X**	Hybrid K-S-M	9	AB AM	
>	**Y**	Hybrid L-S-M	10	AB AM	

Weapons are installed under Weapons but may be used in Defense Modes.

STAGE EFFECTS

	Stage	TL	QREBS	Mod	Tons	Cost
Ex	Experimental*	- 3	Full	-4	x3	+10
Pr	Prototype**	- 2	3 of 5	-3	x2	+3
Er	Early	- 1	1 of 5			+2
St	(Standard)	+0				
Im	Improved	+1	+1 of 5			
Ad	Advanced	+2	+3 of 5	+1		

Tons applies to Mount for non-Weapons.

GLOBES

A Globe absorbs cumulative Damage not to exceed:

Hull Tons x Jump Drive Potential

Overload. If Damage exceeds this value, the Black Globe Generator is destroyed and the Jump Drive is Destroyed.

Ejecting Accumulated Energy. A ship may eject accumulated energy by Jumping, or venting Energy = Hull Tons per Turn.

DEFENSE ABSOLUTE MODE

Attacker		Defender
T+C+S+M	**<**	**T+C+S+M**
G	<	G
Nuke.M-5N	<	N
E	<	Q
AM	<	RQ
-all-	<	T
all (but D)	<	U
HT G*M*	<	W

Attack fails if Attacker T+C+S+M is less than Defender T+C+S+M.

* G-Drive or M-Drive.

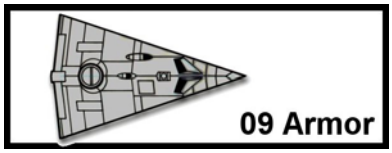
DEFENSE AB AM MODES

Attacker		Defender
1D	<	Mount
	<	1 = T1
	<	2 = T2 B1
	<	3 = T3
	<	4 = T4 B2
	<	5 = Bay
	<	6 = LBay
	<	7 = Main
AFJKLPW	<	S
MNQRV	<	BFGJKL

Defender is a Weapon Mount. Defender rolls equal or less on 1D to stop the attack.

Starship Armor

Starship hulls are constructed from the materials commonly available at the building Tech Level. Armor is installed in layers based on the information presented on this page.



ARMOR PROTECTS

Armor is applied to ships in layers. Any number of layers, may be allocated. Layer1 is automatic and its cost is included in the cost of the hull.

Additional layers of the same or different armor/material can be added at a cost in tonnage and KCr.

Hulls A-B-C-D-E-F-G-H-J add layers at a cost of 1 ton per 100 tons per additional layer.

Hulls K-L-M-N-P-Q-R-S-T add layers at a cost of 2 tons per 100 tons per additional layer.

Hulls U-V-W-X-Y-Z add layers at a cost of 3 tons per 100 tons per additional layer.

STANDARD STARSHIP ARMOR VALUE

Standard AV = TL minus 6

Armor cost is based on Tech Level, Tonnage, and Stage.

KCr = TL x Hull Tons/100 x Stage

Space AV x 10 equals each Personal AV:

Ar= Ca= Ra= So= In= Se=

(FlashProof= TL minus 6)

STAGE EFFECTS

	Stage	TL	QREBS	AV=	Layers	Cost
Ex	Experimental	- 3	Full	-3	3	X 10
Pr	Prototype	- 2	3 of 5	-4	2	x 3
Er	Early	- 1	1 of 5	-5	1	x 2
	(Standard)	+0		-6	1	x 1
Im	Improved	+1	+1 of 5	-5	1	/ 2
Ad	Advanced	+2	+3 of 5	-4	1	/ 2

AV= TL minus this value.

ARMOR TYPES

TL	Type	Characteristics
7	Armor-1	Basic Armor.
8	Ceram-2	
9	Organic-3	Self-Healing. Layer tonnage x2.
10	Dense-4	Layer tonnage /2.
11	Polymer-5	Self-Healing.
12	Charged-6	
13	SDense-7	Layer Tonnage /3
14	Kinetic-8	
15	LiteMetal-9	
16	VliteMetal-10	
17	Hullmetal-11	
18	Geneered-12	Self-Healing.
19	Hydrogen-13	
20	Strange-14	
7	Composite-1	Doubled against Pen.
10	Crystaliron-4	

Base Standard Armor types.

AVAILABLE ARMOR TYPES

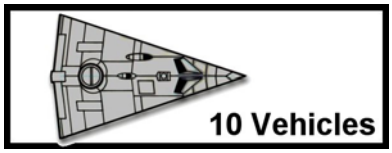
TL	Experimental	Prototype	Early	Standard	Improved	Advanced	TL
4	Armor-1 (/3)						**4**
5	Ceram-1 (/3)	Armor-1 (/2)					**5**
6	Organic-1 (/3)	Ceram-1 (/2)	Armor-1				**6**
7	Dense-1 (/3)	Organic-2 (/2)	Ceram-2	Armor-1			**7**
8	Polymer-2 (/3)	Dense-2 (/2)	Organic-3	Ceram-2	Armor-3		**8**
9	Charged-2 (/3)	Polymer-3 (/2)	Dense-4	Organic-3	Ceram-4	Armor-5	**9**
10	SDense-2 (/3)	Charged-3 (/2)	Polymer-5	Dense-4	Organic-5	Ceram-6	**10**
11	Kinetic-3 (/3)	SDense-4 (/2)	Charged-6	Polymer-5	Dense-6	Organic-7	**11**
12	LiteMetal-3 (/3)	Kinetic-4 (/2)	SDense-7	Charged-6	Polymer-7	Dense-8	**12**
13	VliteMetal-3 (/3)	LiteMetal-5 (/2)	Kinetic-8	SDense-7	Charged-8	Polymer-9	**13**
14	Hullmetal-3 (/3)	VliteMetal-5 (/2)	LiteMetal-9	Kinetic-8	SDense-9	Charged-10	**14**
15	Geneered-4 (/3)	Hullmetal-6 (/2)	VliteMetal-10	LiteMetal-9	Kinetic-10	SDense-11	**15**
16	Hydrogen-4 (/3)	Geneered-6 (/2)	Hullmetal-11	VliteMetal-10	LiteMetal-11	Kinetic-12	**16**
17	Strange-5 (/3)	Hydrogen-7 (/2)	Geneered-12	Hullmetal-11	VliteMetal-12	LiteMetal-13	**17**
18		Strange-7 (/2)	Hydrogen-13	Geneered-12	Hullmetal-13	VliteMetal-14	**18**
19			Strange-14	Hydrogen-13	Geneered-14	Hullmetal-15	**19**
20				Strange-14	Hydrogen-15	Geneered-16	**20**
21					Strange-16	Hydrogen-17	**21**

(/2) =2 layers required (value shown = two layers). If Layer1 is penetrated, Layer2 is automatically penetrated.

(/3) =3 layers required (value shown = three layers). If Layer1 is penetrated, Layer2 and Layer3 are automatically penetrated.

Vehicles and Small Craft

Starships carry vehicles or small craft (or both) for local travel on or near world surfaces.



VEHICLES

Starships may carry vehicles for local travel where using the ship itself is impractical or too risky.

Any vehicle created using VehicleMaker may be assigned to a starship.

As Cargo

The vehicle is carried in the cargo hold of the ship. There are no special fittings or brackets.

Hull Niche

A compartment in the hull opens directly to the outside; the vehicle fits neatly in place and is covered by retractable doors.

Usually placed on the underside of the hull (for ground or watercraft). Placed on upper surface for flyers.

ATTACHED OBJECTS

A ship can attach objects (vehicles, small craft, other ships, cargo pods, fuel tanks) to its exterior provided the ship is equipped with a Jump Bubble.

Jump Potential Is Recalculated. The performance of the ship is recalculated based on the total tonnage including the attached object(s) rounded to the next larger hull size.

Drop Tanks. Fuel Tanks which are discarded after feeding their fuel to the drives, but before jump, are a risky system for increasing overall performance.

Drop Modules. Modular independent detachable ship components (usually for Cargo or Passenger Modules; less frequently Manufacturing or Research Modules) can be carried by a ship.

Drop Modules are ship hulls without drives. The performance of the ship can be recalculated when the Drop Module(s) are detached.

Requires Jump Bubble. Drop objects require Jump Bubble.

SMALL CRAFT

Starships may carry small craft or smaller ships.

Any small craft created using VehicleMaker may be assigned to a ship. A smaller ship designed using ACS may be assigned to a ship.

Hangars

A Hangar is an internal open space within a ship in which small craft and vehicles are stored.

Minimal. A Minimal Hangar can contain a specific small craft or vehicle. Minimal hangars are snug fitting.

Spacious. A Spacious Hangar can contain any reasonably configured small craft of the designated tonnage.

Attached

A Bracket is a mechanical fitting which securely holds a vehicle or small craft on the outside of a hull.

Standard Bracket. Holds a small craft securely, but without creating a streamlined configuration.

Streamlined Bracket. Holds a small craft securely in a depression within the hull. The hull configuration is unaltered (streamlined remains streamlined; lifting body remains lifting body).

Docking Ring. Holds the inserted nose of a small craft securely; the craft trails behind the docking ring.

For any Configuration, but atmospheric flight is not possible which a craft is docked.

A Docking Ring is a fitting into which the nose of a small craft can be inserted. The ring holds the small craft tightly, and the body of the craft trails.

Enclosed (For Ships)

The ship is carried inside a ship. Internal braces hold the ship firmly while in flight.

Grappled (For Ships)

The ship carries the ship (or ships) attached to the hull with heavy duty grapples.

CARRYING VEHICLES, SMALL CRAFT, AND SHIPS

	Type	Tonnage	Config	Cost	HLT	Requires
Vehicle	As Cargo	cargo hold		no	HL= Cargo	
	Hull Niche	Vehicle + 1	USAL	MCr 1	any Open Location	
Small Craft	Minimal Hangar	Small Craft +1		MCr 0.1	HL= Cargo	Folding Wings*
	Spacious Hangar	Small Craft x 2		MCr 0.1	HL= Cargo	Folding Wings*
	Standard Bracket	1 ton	CBU	MCr 1	any Open Location	
	Streamlined Bracket	1 ton	SAL	MCr 0.1	any Open Location	
	1.5 m Docking Ring	Small Craft minus 1 ton		MCr 0.1	any Open Location	Jump Bubble
	3.0 m Docking Ring	Small Craft minus 1 ton		MCr 0.1	any Open Location	Jump Bubble
	4.5 m Docking Ring	Small Craft minus 7 tons		MCr 0.5	any Open Location	Jump Bubble
Ship	Enclosed	Ship x 1.5		no	HL= Cargo	
	Grapple	1 ton per 100 tons carried		MCr 1	any Open Location	Jump Bubble
Drop Objects	Grapple	1 ton per 100 tons carried		MCr 1	any Open Location	Jump Bubble

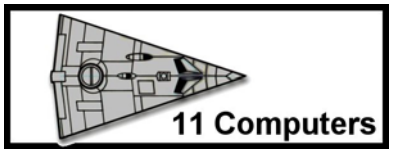
If a winged Small Craft (Config=A or Config=S with W) requires Folding Wings.

Exceeding original hull tonnage. If the addition of vehicles, small craft, ships, drop objects, or modules exceeds the original hull tonnage, recalculate hull tonnage (round up to the next higher 100-ton increment).

HLT= Hit Location Table. Object is carried in a designated Hit Location.

Computers

Computers fill a variety of roles in the control of equipment, vehicles, and the processes of industry and bureaucracy. Computers operate in a number of ways to complement, supplement, supplant, or replace active intelligent control or supervision.



THE SHIP'S COMPUTERS

Select a master Ship's Computer.
Install it on the Bridge.
Note the Local Computers for each of the Major Components.
Create the Local Network.

COMPUTER CONCEPTS

Cells hold Processes. The ship's computer network needs enough cells to hold all of its software processes.

Free Cells enhance efficiency. Empty cells help a computer process more rapidly.

THE SHIP'S COMPUTER

Every ship has a master Ship's Computer located on the Bridge. It networks with the many Local Computers throughout the ship.

Local Computers. Every major component has its own Local Computer managing its activities and operation.

The Standard **Local Computer** is a Model/2 loaded with a Console System Process and the appropriate Component Process.

Major Components

Each item in these categories is a Major Components and has a Local Computer.

Drives
Power Plants
Sensors
Weapons
Defenses

Computers are identified by Model, and distinguished by TL, Cells, and Cost.

Cells. Computer capacity is measured in Cells. One cell can contain one Process. A system operates most efficiently if free Cells equal installed Processes.

Computer Tonnage. Computers are not all that big: one Cell is a Lan, or about 100 Cells per ton. Model/5 and lower is dwarfed by its control console (which is about one Deck Square).

Brain Tonnage. Brains are installed in an existing Cell, so while the Brain itself is about 1 or 2 liters, it is part of a larger Cell.

COMPUTERS

M	Stage	Model	TL	=	Cells	KCr	Tonnage
0		Model/0	5	2^0	1	100	
1		Model/1	6	2^1	2	200	Console
1b		Model/1 bis	7	2^1+1	3	300	Console
2		Model/2	7	2^2	4	400	Console
2b		Model/2 bis	8	2^2+1	5	500	Console
3		Model/3	9	2^3	8	800	Console
3b		Model/3 bis	10	2^3+1	9	900	Console
4		Model/4	10	2^4	16	1600	Console
5		Model/5	11	2^5	32	3200	Console
6		Model/6	12	2^6	64	6400	1 ton
7		Model/7	13	2^7	128	12800	2 tons
8		Model/8	14	2^8	256	25600	3 tons
9		Model/9	15	2^9	512	51200	5 tons
Ex	Experimental (= Full QREBS)		-3			x 10	x 3
Pr	Prototype (= 3 of 5)		-2			x 3	x 2
Ea	Early (= 1 of 5)		-1			x 2	
Im	Improved (= +1 of 5)		+1			/ 2	
Adv	Advanced (= +3 of 5)		+2			/ 2	
	Fiber Optic	fib	+1			x 1.5	x 2
	Photonic	phot	+3			/ 2	
	Fluidic	flu	+4			x 2	x 2
	Neural Network	neu	+5			x 2	

M. The model number or variant suffix for the computer.
Stage. The technological development stage for the computer.
Model. The standard model name for the computer (bis = second or enhanced).
TL. The tech level of the computer.
=. Shows the formula for computing the number of cells based on Model.
Cells. The number of internal computer operating cells. Each cell holds a process.
KCr. Computer cost.
Tonnage. The ship tonnage requires for the computer.

NETWORK UPGRADES

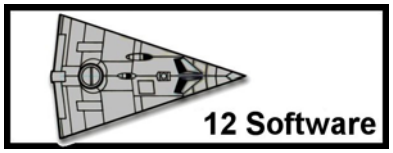
Upgrade	Status
Hardwire Connections	Standard
Specific Links Cut	Upgrade
Wireless Connections	Upgrade

Network Upgrades are available at no cost, but must be specified.

Default Network. All Local Computers and the Master Computer are default hardwire networked with each other. Upgrade the Network as desired.

Software

The heart of the computer is its software. Each major component and many housekeeping functions are managed by computers controlled by Processes dedicated software packages that relieve people of the burden of day-to-day activities.



COMPUTER PROCESSES

The software that drives a computer is the Process. Each Process addresses a specific function and manages it within the computer.

There are three types of Processes:

System. The Operating System for a Computer. Every Computer requires an Operating System Process.

Component. The governing Process for a Component.

Service. A Process providing support or information.

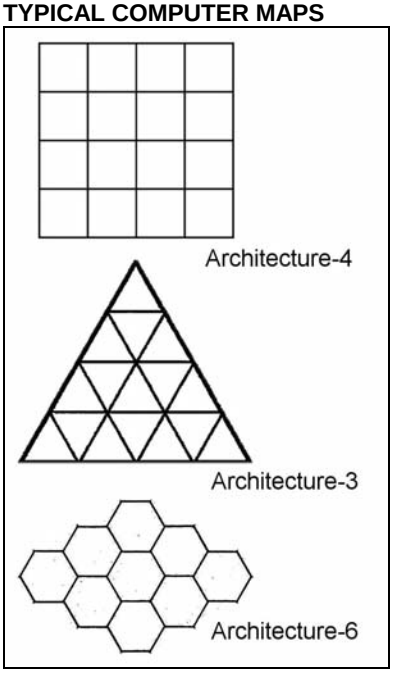
Redundant

Three identical Processes allow a Computer to automatically ignore a computing failure by one of the three.

Brain Tonnage. A Brain is installed in an existing Cell, so while the Brain itself is about 1 or 2 liters, it is part of a larger Cell.

Free Cells. A system operates most efficiently if it has free Cells equal to installed Processes. If the Computer has fewer than one empty cell per operating Process, output is delayed one Round.

TYPICAL COMPUTER MAPS



SYSTEM PROCESSES

M	Type	Process	TL	KCr	C	S
3.1	Console	Process	7	50		
XP	Console XP	Process	8	50		
	Conversational	Process	9	100		
XS	Expert System	Process	10	200		
SA	Self Aware	Process	14	300		
S0	Semi-Organic	Brain-0	10	100	1	1
S1	Semi-Organic	Brain-1	11	400	1D	1D
S2	Semi-Organic	Brain-2	12	800	2D	2D
S3	Semi-Organic	Brain-3	14	1200	3D	3D
P0	Positronic	Brain-0	11	400	1	1D
P1	Positronic	Brain-1	12	900	1D	1D
P2	Positronic	Brain-2	13	1500	2D	2D
P3	Positronic	Brain-3	15	2000	2D	3D
AI-16	Artificial Intelligence	Process	16	2000	1D	1D
AI-18	Artificial Intelligence	Process	18	3000	2D	2D
AI-20	Artificial Intelligence	Process	20	4000	2D	3D
AI-22	Artificial Intelligence	Process	22	5000	3D	3D

Each computer (Local or Master) requires a System Process. It must be installed in the computer is controls. It occupies one Cell.

COMPONENT AND SERVICE PROCESSES

Process	Type	TL	Cells	KCr	C	S
Drive	Component	=Jump	1	=TL		
Power Plant	Component	=PPlant	1	=TL		
Sensor	Component	=Sensor	1	=TL		
Weapon	Component	=Weapon	1	=TL		
Defense	Component	=Defense	1	=TL		
Guidance	Component		1	10		
Life Support	Service		1	10		
Data Base	Service		1	10		
Accounting	Service		1	10		
Astrogation	Service		1	10		
Medical	Service		1	10	2D	1D
Entertainment	Service		1	10		
Library Data	Service		1	10		
Security	Service		1	10		
Maintenance	Service		1	10		
Damage Control	Service		1	10	1D	1D

Component Processes must be installed in the Computer which controls the Component. The System Process is the controlling software for the computer.

Distributed Processing. Service Processes may be installed in any available Cell in any computer.

COMPUTER MAPS

The interior of a computer can be mapped. It shows the Computer's Cells on a grid based on the computer Architecture.

Architecture-N. Architecture is the number of connections between cells. Architecture-4 connects a cell to 4 adjacent cells; Architecture-9 indicates connections to 9 adjacent cells.

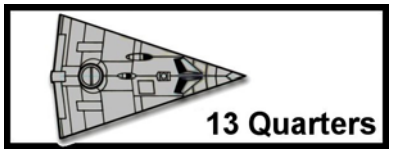
Architecture-3 is triangles; Architecture-4 is squares; Architecture-6 is hexagons.

Many possible architectures exist: for example, Architecture-9 wrapped to a cylinder; Architecture-5 mapped to a sphere.

Standard Imperial Computer Architecture is a compact bounded flat plane with a square grid (Architecture-4).

Quarters

Once the essential components of a ship have been specified, the crew can be determined and suitable accommodations for crew and passengers installed.



DETERMINING THE CREW FOR A SHIP

At the simplest possible level, there is no firm requirement for crewmembers for a ship: the ship simply requires individuals who can accomplish the tasks necessary for its operation. Over time, and with experience, naval architects and starship managers have developed basic crew requirements based in **positions** or on **skills**.

Title		Position-Based	Skill-Based
Pilot		Qualified Pilot.	Pilot = 1 level per G
Astrogator		Qualified Astrogation.	Astrogation = 1 level per J
Engineer		Qualified Engineer (1 per 35 tons of drives)	Engineer = 1 level per 35 tons
Medic		Qualified Medic (1 per 30 passengers and crew).	Medic = 1 level per 30
Steward		Qualified Steward (1 per 8 passengers)	Steward = 1 per 8 passengers
Freightmaster		Qualified Trader or Q Broker (1 per 1000 tons of hold)	Trader or Broker = any
Gunner		Qualified Gunner (1 per 2 weapons installations).	Gunner = 1 per 2 weapons installations
Counsellor	optional	Counsellor	Counsellor = any
Troops	optional	Fighting	Fighting = any

Qualified = He must show the ability to succeed at an Easy task at least 75% of the time. When a job or vocation states a skill-related job title, a character must generally be Qualified in order to be hired.

SUBSTITUTE CREW

Any component on a ship can be operated by its Computer based on that computer's C+S.

ACCOMMODATIONS ON A SHIP

In design and construction, a ship must allocate at least four tons per crew member and passenger, further divided between quarters and common areas.

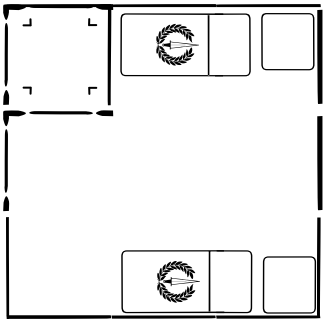
Crew Quarters. Living quarters must be installed for every serving crew member and passenger. The table shows specific requirements based on rank.

Passenger Staterooms. If a ship carries passengers, specific separate staterooms must be allocated.

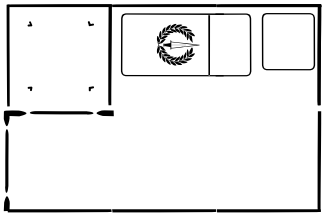
REQUIRED QUARTERS TONNAGE

Description	Tons	Comment	Occupants	MAQQ Quality
Crew				
Senior Officer	3	Officers O4-O6	1	75%
Junior Officers	3	Two Officers O1-O3	2	38%
Ratings Quarters	3	Four Ratings in Bunks	4	19%
Spacer Niche	1	One crew member	1	25%
Spacer Bunks	1	Two crew persons	2	13%
Spacer Hot Bunks	1	Two per watch (3 watches)	6	5%
Passengers				
Luxury Single	4	High Passengers	1	100%
Standard Double	4	Middle Passengers	2	50%

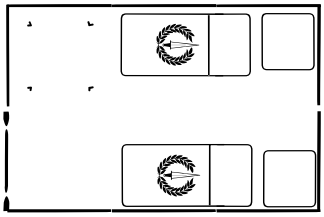
Luxury Single 4 tons
Standard Double 4 tons



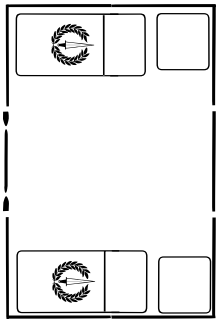
Senior Officer 3 tons



Junior Officer 3 tons
Ratings Quarters 3 tons



Junior Officer 3 tons
Ratings Quarters 3 tons



MAQQ

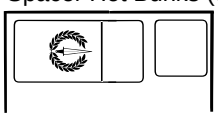
Minimum Average Quarters Quality MAQQ is a measure of the quarters space devoted to crew members. Most civilian (non-military) ships require an MAQQ of 50%.

MAQQ = .25 * Quarters Tons / Occupants

Common Areas. Non-quarters accommodation tons become common areas.

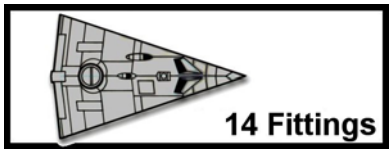
Standard Accommodations. Examples shown support sophonts approximately human size (Size = 100).

Spacer Niche (1) 1 ton
Spacer Bunks (2) 1 ton
Spacer Hot Bunks (6) 1 ton



Fittings

Ships have a variety of miscellaneous components filling a variety of functions.



LANDING GEAR		Standard on	Add
J	Landing Skids	Config-U	+ MCr1
K	Landing Legs	Config-S	+ MCr1 and +1 ton
L	Landing Wheels	Config-A, L	+ MCr1 and +1 ton
G	Grapples	No	+ MCr1 and +1 ton
Z	Lifters	Config-U, S	+ MCr1

Code Description

J **Landing Skids.** Retractable horizontal bars bear the ship's weight. Requires bedrock or tarmac landing site. Config-U Standard.

K **Landing Legs With Pads.** Retractable legs end in pads. Can tolerate uneven landing terrain. Config-S Standard.

L **Landing Wheels.** Retractable legs end in wheels. Allows glide landing / takeoff from airstrip. Config-A and L Standard.

G **Grapples.** Retractable grasping claws to interface with other ships. Allows mating with another ship also equipped with Grapples.

Z **Lifters.** Grav Plates provide limited hover capability.

FLOTATION HULL		Standard On	Add
D	Flotation Hull	Config-L	+ MCr1 and +1 ton
E	Submergence Hull	No	+ MCr2 and +1 ton

Code Description

D **Flotation Hull.** Sealed to protect against prolonged water or fluid exposure. Allows glide landing and takeoff from water.

E **Submergence Hull.** Hull is sealed to protect against prolonged water or fluid exposure. Includes ability to submerge and resurface. Allows glide landing and takeoff from water. Doubles the Pressure the hull (based on its Armor) can withstand.

FUEL ACCESSORIES		Standard on	Add
F	Fuel Scoops	No	+ MCr1
W	Purifier	No	+ MCr1 and + 1 ton

Code Description

F **Scoops.** Intake raw fuel from gas giant atmospheres. Intakes water from lake or ocean.

W **Purifier.** Transforms raw fuel into purified fuel at about 100 tons per day per ton of purifier.

FUEL TANKAGE

Allocate Fuel Tankage for the ship based on the drives carried.
Power Plant (per week) = P x H
Anti-Matter Plant (per year) = 1 ton console.
Collector = not required.
Jump Drive (per jump) = J x H /10

J= Jump Number.
P= Power Plant Drive Potential.
H= Hull Number (= tons /100).

WINGS AND FINS		Standard	
F	Fins		+ MCr1 and + 1 ton
W	Wings (and Fins)	Config-A	+ MCr1 and + 1 ton
K	Folding Wings	No	+ MCr1 and + 1 ton
L	Lifting Body	Config-L	cannot be added

* per 100 tons

Code Description

F **Fins.** Increase performance in atmosphere.

W **Wings (and Fins).** Increase performance of drives in atmosphere. Includes Fins.

K **Folding Wings.** Installed wings (and fins) can be folded for storage.

L **Lifting Body.** Assumes the advantages of Fins and Wings.

How Wings and Fins Work

The performance of ships operating **in atmosphere** (Atm= 2+, or P=1 or greater) is improved by Fins, Wings, and Wheeled Landing Gear.

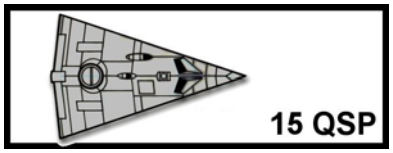
Fins on a ship operating **In Atmosphere** increase Agility +1.

Wings on a ship operating In Atmosphere increase Maneuver Drive performance +1 G.

Wheeled Landing Gear is required when Wings are used for Liftoff and Landing.

The Quick Ship Profile

The basic performance for a ship can be gleaned from the QSP; the Extensions provide information about vehicles and crew.



Adventure Class Ships are briefly identified using the QSP Quick Ship Profile and (if necessary) Extensions which provide additional information. For example, a 200-ton Jump-1 Maneuver-1 Free Trader is identified with QSP A-2211.

QUICK SHIP PROFILE

A2	-	2	2	1	1
Mission		**Hull**	**Config**	**Gs**	**Jump**

The **Quick Ship Profile** (QSP) shows the basic performance characteristics of a spacecraft.

Mission. Basic ship purpose.
Hull. Tonnage (volume) of the ship hull.
Config. Ship hull structure.
G's. Ship maximum maneuver capability in Gs.
Jump. Ship maximum jump capability.

The QSP Extensions allow additional information to be easily added to the QSP.Extensions are used only where needed.

Vx THE VEHICLE EXTENSION

Vx: Q1-1 (ATV-1)

The **Vehicle Extension** is preceded by the Code Vx:

Note the Vehicle Code and the Quantity (use a dash between the Code and the Quantity). Some short vehicle names may be used instead of Codes.

VEHICLE CODES

Code	Vehicle	Alt Code	
A	ATV		
B	Boat or Sub		
C	Cargo Module		
F	Flyer		
G	GroundCar		
L	Lander		
M	MTV		
R	Rotor flyer		
S	STV		
T	Tank		
V	Military Vehicle		
W	Winged flyer		
Q0	Pod. Gig. Lifepod.	QG	
Q1	Fighter.	QF	
Q2	Launch.	QL	
Q3	Ship's Boat.	QB	
Q4	Pinnace.	QP	
Q5	Cutter.	QC	
Q6	LR Fighter	QR	
Q7	Picket.	QK	
Q8	Tanker	QT	
Q9	Shuttle.	QS	

Vehicles which are carried within the Hull are Carried and are enclosed in Parens. Other vehicles are externally mated to the hull.

Small Craft carry the prefix Q (from the Missions Table).

For example, a Far Trade carries one

Cx THE CREW EXTENSION

Cx: A1 E1 G1 P1 R1

The **Crew Extension** is preceded by the Code Cx:

The Crew Extension provides the details of the Crew of a Starship.

CREW CODES

Code	Position			
A	Astrogator			
C	Counsellor			
E	Engineer			
F	Freightmaster			
G	Gunner			
M	Medic			
P	Pilot			
S	Steward			
T	Troops			
R	Sensor Tech			

The Crew Extension is created by noting the quantity of each Crew Position after each Crew Code.

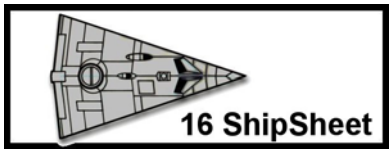
For example, a Free Trader requires one each of Pilot, Astrogator, Engineer, Gunner, Medic, and Steward.

Cx: A1 E1 G1 P1 S1.

Cx = Crew Extension. Not to be confused with Cx Cultural Extension associated with Worlds.

Creating The ShipSheet

The ShipSheet records damage to a ship and governed how damage is inflicted.



LAYERS

1	
2	
3	
4	
5	
6	

HIT LOCATION TABLE

-9	
-8	
-7	
-6	
-5	Comms
-4	Cargo
-3	Sensors
-2	Defenses
-1	Life Support
0	Hull
+1	Power
+2	Drives
+3	Weapons
+4	Bridge
+5	Computer
+6	
+7	
+8	
+9	

THE ELEMENTS OF THE SHIPSHEET

The ShipSheet is a unique record of the starship and how damage affects it.

The ShipSheet Tables are custom filled based on the ship designer's concepts and within the constraints of the Ship Design Rules.

Armor

Insert in the Layers Box the layer of armor on the hull. If there are more layers than spaces, use an additional sheet.

The Hit Location Table

The recommended or default Hit Locations are printed on the Hit Location Table.

Ship Design may place them in other locations, provided all 11 Locations are on the table and Hull is at Hit Location= 0.

Unless otherwise noted, the 11 entries must be in Hit Locations -5 to +5.

Drives. If the ship has a Jump Bubble, Drives must be in Hit location -1, 0, or +1.

If the ship has a Jump Grid, Drives may be in any Hit Location -5 to +5.

Cluster Hulls. A Cluster Hull Config-C may place the Locations in any Hit Locations -9 to +9. Gaps may be present between Locations.

Cluster may omit Hull as a Location.

Braced Cluster Hulls. A Braced Cluster Hull Config-B may place the 11 Elements in any Hit Locations -7 to +7. Gaps may be present between Elements.

Brace Cluster may omit Hull as a Location.

Carried Vehicles and Craft. Vehicles as Cargo or Small Craft in Hangars are part of Hit Location = Cargo.

Attached Objects. Grappled or Docked craft. and vehicles carried in Niches are noted in an otherwise unoccupied Hit Location adjacent to a filled Hit location.

Drives and Power

Note that Drives are distinct from the Power Plant.

Fuel Tankage is placed in Hit Location= Power.

Extended Objects

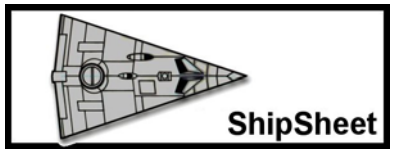
Some Sensors are Extendable. When retracted, they are in the Sensor Hit location. When Extended, they are in an otherwise unoccupied Hit Location.

Deployable Mounts

Some weapons and sensors are in Deployable mounts. When deployed, they are separate objects at Location=0 on a separate Hit location Table.

LARGE SHIPS

When entries require more spaces on the ShipSheet (for example, more Weapons than available entries), create additional available entries and number them to allow random selection of them



Ship Name	Out Of	Hull Number
Mission	QSP and Extensions	

LAYERS

1	
2	
3	
4	
5	
6	

HIT LOCATION TABLE

-9	
-8	
-7	
-6	
-5	Comms
-4	Cargo
-3	Sensors
-2	Defenses
-1	Life Support
0	Hull
+1	Power
+2	Drives
+3	Weapons
+4	Bridge
+5	Computer
+6	
+7	
+8	
+9	

COMMS X

1		
2		
3		
4		

CARGO/ PAYLOAD X

1		
2		
3		
4		
5		
6		

SENSORS X

1		
2		
3		
4		
5		
6		
7		
8		
9		
0		

DEFENSES X

1		
2		
3		
4		
5		
6		
7		
8		
9		
0		

LIFE SUPPORT X

1	Life Support	
2		
3		
4		
5		
6		

HULL X

1		
2		
3		
4		

POWER X

1		
2		
3		
4		

DRIVES X

1		
2		
3		
4		
5		

WEAPONS X

1		
2		
3		
4		
5		
6		
7		
8		
9		
0		

BRIDGE X

1	Main Controls	
2	Astrogator	
3		
4		
5		
6		

COMPUTER X

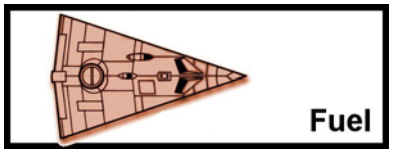
1	Ship's Computer	
2		
3		
4		
5		
6		

TARGETTING

Center Of Mass. Mod= Min plus Max entry on HLT.
Center of Heat. Mod= Drives.
Center of Emissions. Mod= Sensors or Comms.

Fuel for Starships

Power Plants process fuel (or use other processes) to provide the energy required by ships.



POWER PLANTS

Starships use Power Plants to process fuel to create energy to power their operations.

Component Power Sources. Most components on a starship are self-powered: each sensor, most weapons and defenses, and many components are self-powered with FusionPlus modules. Localized power makes the component power independent in the event of a central power failure, major damage, or malfunction.

Central Power Source. A ship also requires a central Power Source to support its Interplanetary and Interstellar drives.

The three basic Power Sources for starships are the Power Plant, the Anti-Matter Plant, and the Collector. Each has its own governing details.

POWER PLANTS

The Power Plant is a Fusion Power Supply adapted to use in starships. Power Plants are the most commonly available ship power sources.

The system uses Hydrogen as its fuel. Hydrogen is available at many starports.

Routine Fuel Use

A Power Plant requires Fuel = PPlant Drive Potential x Hull Number in tons, per week. Fuel is stored in fuel tanks throughout the ship.

ANTI-MATTER PLANTS

The Anti-Matter is an advanced Power Source; it produces energy from matter-anti-matter reactions.

The system uses anti-matter as its fuel. Anti-Matter slugs are available at TL 16 or greater Class A starports.

Routine Fuel Use

An Anti-Matter Plant is fuelled with a 1 ton console within the Plant; it contains containing slugs of anti-matter. Each slug (which is quite small) is magnetically isolated until used.

COLLECTORS

The Collector is an alternative Power Source. It extends a Canopy which gathers energy (a combination of photons and exotic particles) radiated from stars and gas giants.

Routine Energy Use

A Collector is unsuitable as a routine energy supply. The major components of the ship rely on their individual power supplies.

OVERCLOCK

Power Plants and Anti-Matter Plants can easily provide power for ordinary operations. When used to power Jump, the Plant shifts to Overclock Mode.

A fresh, newly overhauled P-Plant or AM-Plant has an Overclock OC rating = 42 plus Quality and each use in Overclock Mode reduces its rating by 1; a Plant is typically overhauled annually to refresh its Overclock rating.

	P-Plant or A-Plant
Failure Rate QFR=	37 + Quality
Per Use Reduction	-1
Jump Failure	Check FR (4D)
Malfunction	Check FR (4D) if Jump Failed

A standard Quality Power Plant newly overhauled has a Failure Rating= 37 + 5 = 42. There is no chance of drive failure (due to Overclock) on its first use. After 19 jumps, Failure Rate = 23, and there is a remote chance of failure (of rolling 24 on 4D). After 26 jumps, Failure rate = 16, and the chance of failure (of rolling 17 or greater on 4D) is about 24%. Most ships stop for an overhaul before this point.

Jump Failure. If the jump fails, the fuel involved is wasted; the ship may need to refuel before attempting another jump.

FUEL

Power Plant Fuel	= P x T	Per week	Cr500 for refined fuel at a Starport; no cost skimmed or gathered.
Jump Drive Fuel	= J x T / 10	Per Jump	
Hop Drive Fuel	= H x T / 100	Per Hop	
Skip Drive Fuel	= S x T / 100	Per Skip	
NAFAL Fuel	= G x T /100	Per Month	
Maneuver Drive Fuel			
Anti-Matter Plant	= 1 ton (console)	Per Year	MCr2 per console.
Collector	special	special	MCr3 per canopy

CANOPY DEGRADATION

The Canopy of the Collector degrades with use. A newly installed Canopy has a Canopy Failure Rate= 500 plus Quality.

	Collector
Failure Rate FR=	500 + Quality.
Per Use Reduction	- 1D
Jump Failure	Check FR (4D)
Malfunction	Check FR if Jump Failed

A standard-Quality Canopy newly installed has a Failure Rate = 505. Failure is not a problem for many months.

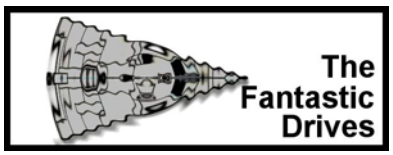
Time To Recharge

The time to charge a Canopy (in years) = (10/ Failure Rate) + Flux.

FR=	Time To Recharge
500	0.02 years = 7 days + Flux
200	0.05 years = 18 days + Flux
50	0.20 years = 72 days + Flux
23	0.43 years = 158 days + Flux

The Fantastic Drives

The Fantastic Drives are uncommonly encountered interstellar drives available only as artifacts or at extremely high Tech Levels.



DRIVE TONNAGE

Drive Letter	Rating EP	J J-Drive	H H-Drive	S S-Drive	N N-Drive
A	100	10	1	10	30
B	200	15	2	20	60
C	300	20	3	30	90
D	400	25	4	40	120
E	500	30	5	50	150
F	600	35	6	60	180
G	700	40	7	70	210
H	800	45	8	80	240
J	900	50	9	90	270
K	1000	55	10	100	300
L	1100	60	11	110	330
M	1200	65	12	120	360
N	1300	70	13	130	390
P	1400	75	14	140	420
Q	1500	80	15	150	450
R	1600	85	16	160	480
S	1700	90	17	170	510
T	1800	95	18	180	540
U	1900	100	19	190	570
V	2000	105	20	200	600
W	2100	110	21	210	630
X	2200	115	22	220	660
Y	2300	120	23	230	690
Z	2400	125	24	240	720
N2	2600	140	26	260	750
P2	2800	150	28	280	780
Q2	3000	160	30	300	810
R2	3200	170	32	320	840
S2	3400	180	34	340	870
T2	3600	190	36	360	900
U2	3800	200	38	380	930
V2	4000	210	40	400	960
W2	4200	220	42	420	990
X2	4400	230	44	440	1020
Y2	4600	240	46	460	1050
Z2	4800	250	48	480	1100

DRIVE TL

TL	J	H	S	N	TL	J	H	S	N
9	1	-	-	1	21	-	-	-	7
10	1	-	-	-	22	-	-	-	-
11	2	-	-	2	23	-	1	-	8
12	3	-	-	-	24	-	2	-	-
13	4	-	-	3	25	-	3	-	9
14	5	-	-	-	26	-	4	1	-
15	6	-	-	4	27	-	5	2	-
16	6	-	-	-	28	-	6	3	-
17	7	-	-	5	29	-	7	4	-
18	7	-	-	-	30	-	8	5	-
19	8	-	-	6	31	-	9	6	-
20	8	-	-	-	32	-	-	7	-

COSTS

Drive	MCr
Jump	1.0
Hop	5.0
Skip	5.0
NAFAL	1.0
Per Ton	

THE FANTASTIC DRIVES

Any of the Drives shown here must be supported by a Power Plant with Drive Potential at least equal to this Drive's Potential.

Jump Drive (shown for comparison). Jumps are measured in parsecs; one Jump (regardless of distance) requires one week.

The Mythical "Hop" Drive. Hops are measured in tens of parsecs; the ship Hops exactly that distance; one Hop takes about a day. Fuel usage is relatively small.

The Rumored "Skip" Drive. Skips are measured in hundreds of parsecs, but the final distance is inexact. One Skip (regardless of distance) requires several hours. Fuel usage is negligible. A Skip contaminates Jump Space in its originating system, and is subject to SkipScatter.

NAFAL. The **Not As Fast As Light** interstellar drive. The drive accelerates the ship perpendicular to a gravity source and decelerates the ship perpendicular to the destination gravity source. Acceleration is in Gs.

FUEL REQUIREMENTS

Drives require fuel to provide energy. Fuel is Hydrogen, stored under pressure and liquefied, fed from fuel tanks to the appropriate drive.

Hop Drive (per Hop). A Hop Drive requires 1% of Hull Tonnage per Hop number (subject to PPlant Overclock) per use. A Hop Drive can perform ONLY a Hop equal to its Potential.

Skip Drive (per Skip). A Skip Drive requires 1% of Hull Tonnage per Skip number (subject to PPlant Overclock) per use. A Skip Drive can perform ONLY a Skip equal to its Potential and is subject to Skip Scatter (1 parsec in a random direction from the destination hex).

NAFAL (per month). A NAFAL Drive requires 1% of Hull Tonnage per G number (subject to PPlant Overclock).

STAGE EFFECTS

	Stage	TL	QREBS	OC	Tons	Cost
Ex	Experimental*	- 3	Full	50	x3	x10
Pr	Prototype**	- 2	3 of 5	80	x2	x3
Er	Early	- 1	1 of 5	90		x2
	(Standard)	+0		100		
Im	Improved	+1	+1 of 5	110		
Ad	Advanced	+2	+3 of 5	120		

OC= Overclock (for Power Plants only; ignore Tons).

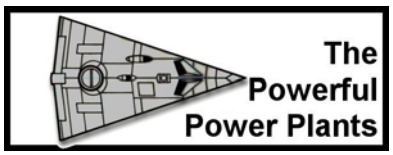
OVERCLOCK

Standard P-Plant tonnage is based on Overclock= 100.

True P-Plant tons = Power Plant Tons / (OC/100)
True **Hop** Fuel Required= Fuel / (OC/100)
True **Skip** Fuel Required= Fuel / (OC/100)

The Powerful Power Plants

The Powerful Power Plants are uncommonly encountered power sources suitable for installation on starships. The F Fusion Plant is shown for comparison.



DRIVE TONNAGE

Drive Letter	Rating EP	P P-Plant	A A-Plant	C Collector	F Fusion Plant
A	100	4	31	10	400
B	200	7	32	20	700
C	300	10	33	30	1000
D	400	13	34	40	1300
E	500	16	35	50	1600
F	600	19	36	60	1900
G	700	22	37	70	2200
H	800	25	38	80	2500
J	900	28	39	90	2800
K	1000	31	40	100	3100
L	1100	34	42	110	3400
M	1200	37	44	120	3700
N	1300	40	46	130	4000
P	1400	43	48	140	4300
Q	1500	46	50	150	4600
R	1600	49	52	160	4900
S	1700	52	54	170	5200
T	1800	55	56	180	5500
U	1900	58	58	190	5800
V	2000	61	60	200	6100
W	2100	64	62	210	6400
X	2200	67	64	220	6700
Y	2300	70	66	230	7000
Z	2400	73	68	240	7300
N2	2600	80	70	260	8000
P2	2800	86	72	280	8600
Q2	3000	92	74	300	9200
R2	3200	98	76	320	9800
S2	3400	104	78	340	10400
T2	3600	110	80	360	11000
U2	3800	116	82	380	11600
V2	4000	122	84	400	12200
W2	4200	128	86	420	12800
X2	4400	134	88	440	13400
Y2	4600	140	90	460	14000
Z2	4800	146	92	480	14600

POWER TL

TL	P	A	C	F	TL	P	A	C	F
8	1	-	-	-	21	-	6	-	-
9	2	-	-	1	22	-	7	-	-
10	3	-	-	2	23	-	8	-	-
11	4	-	-	3	24	-	9	-	-
12	5	-	-	4	25	-	-	-	-
13	6	-	-	5	26	-	-	-	-
14	7	-	-	6	27	-	-	-	-
15	8	-	-	7	28	-	-	-	-
16	9	1	-	8	29	-	-	-	-
17	-	2	-	9	30	-	-	-	-
18	-	3	5	-	31	-	-	-	-
19	-	4	9	-	32	-	-	-	-
20	-	5	-	-	33	-	-	-	-

COSTS

Drive	MCr
P-Plant	1.0
A-Plant	2.0
Collector	0.5
Fusion	1.0
Per Ton	

THE POWERFUL POWER PLANTS

A Power Plant must have Drive Potential (from the Drive Potential Table) equal or greater than the Drive(s) it supports.

Power Plant (shown for comparison). A Fusion Power Generator with OverClock Capabilities.

Anti-Matter Power Plant. A Power Generator based on Matter-AntiMatter interactions.

Collector. A Power Collector system which accumulates stellar energy over time.

A Collector is half internal mechanism and half external Canopy.

Fusion Installation (shown for comparison). An industrial or community Fusion-based power source.

FUEL REQUIREMENTS

Drives require fuel to provide energy.

Power Plants and FusionPlants require Hydrogen, stored under pressure and liquefied, fed from fuel tanks.

Power Plant. A Power Plant requires 1 ton of fuel times Drive Potential per Hull Number (= tons / 100) per week to support normal operations (that feeds about a liter of liquid hydrogen per minute to the power plant per Potential per 100 tons of Hull).

Anti-Matter Plant. An AM Plant is fuelled by Anti-Matter slugs contained by magnetic or gravitic fields. A one-ton Console contains enough slugs to provide power for a year.

Collector. A Collector gathers energy (It gathers energy (a combination of photons and exotic particles) radiated from stars and Gas Giants.

STAGE EFFECTS

	Stage	TL	QREBS	OC	Tons	Cost
Ex	Experimental*	- 3	Full	50	x3	x10
Pr	Prototype**	- 2	3 of 5	80	x2	x3
Er	Early	- 1	1 of 5	90		x2
	(Standard)	+0		100		
Im	Improved	+1	+1 of 5	110		
Ad	Advanced	+2	+3 of 5	120		

OC= Overclock (PPlants and AM Plants; ignore Tons).

OVERCLOCK

Standard P-Plant tonnage is based on Overclock= 100.
True Power Plant tonnage = Power Plant Tons / OC

Sensors

Sensors are the technological eyes and ears (and other senses) of starships (and of star system installations). Technology magnifies the capabilities of personal senses and translates the information that sensors gather into understandable formats.

Sensors are examples of technology; their use is an example of personal task resolution. Together, they give information to characters about their environments.

THE PURPOSE OF THE TRAVELLER SENSOR SYSTEM

The **Traveller** sensor system and its mix of devices allows the crew of a starship (or spacecraft, or vehicle, or installation) to acquire knowledge about objects and phenomena around them in a series of information-gathering steps. Rather than knowing everything about a star system or plant or region all at once, the information becomes available in a series of readings.

The Referee Has Perfect Knowledge

He knows if an enemy starship is lurking in the planetoid belt, or behind a gas giant. Or, he knows that the present star system is totally vacant, with no threats or dangers other than natural ones.

The Players Have No Knowledge.

They depend on the readings from their sensors to develop an understanding of the situation. Dare they risk moving directly to the barren mainworld, not knowing what ships might lie in ambush? Dare they move closer, risking being detected by possible enemies as they do?

The Process

The Sensor Process becomes part of the excitement as players investigate each new star system, planet, and even planetary location, moving ever closer as their use their sensors, and risking disaster if they guess wrong.

Used Only When Necessary. The Sensor Process is a sequence of steps dealing with the unknown. If the system is totally unknown to the characters, then using the Sensor Process is entirely appropriate. If the system is familiar, then Sensors come into play only when problems or unusual readings occur.

UNDERSTANDING SENSORS

Sensors are technological devices which provide information about the environment. Sensors are identified by a LongName (with enough detail to define its usage) which includes Stage, Range, Sensor Name, and Tech Level.

Each specific type of Sensor is also identified by a single Letter Code (for example, C = Communicator).

Types of Sensors. Sensors are available in a variety of generalized types. **Space Sensors** are used over the vast distances of space. **World Sensors** are used over smaller distances associated with a world. They are also more closely tailored to the information that examination of a world can provide.

USING SENSORS

Sensors reveal the details of the universe to the players. Their output is in three distinct stages:

Alert. When there is something of possible interest, the Referee conveys to the players an Alert:

"Your [sensor] sees something about here [location].

Detection. Using the Sensor Task, the characters try to resolve what gave the alert (or they can ignore it). Success in the Sensor Task provides information about the alert.

Tracking. Once a sensor detects an object, it can track that object until some event causes the signal to be lost (it moves out of range; it is hidden by a world; it deliberately jams or hides its signal).

THE SENSOR TASK

		TL	Char	Skill	Mod
nD	**<**	**T**	**+C**	**+S**	**+M**
n = Range			Use: C4 C5	Use: Sensor	
Uncertain (1D)					

A Sensor cannot operate beyond its stated Range.

The Sensor Task determines the success of the effort.

Because the possible readings are unknown, the Referee administers the task in increments based on the dice used:

The Uncertain Die. The referee rolls the Uncertain Die secretly and notes its result. Players can assume the result is 3 (although it may be between 1 and 6). If this assumed 3 is less than T+C+S+M, he reveals anything detected at S=1 (for Space Sensors) or R=1 for (World Sensors).

The Second Die. The referee rolls the second Die and if the total is less than T+C+S+M, he reveals anything detected at S=1 (for Space Sensors) or R=1 for (World Sensors).

Additional Dice. This process allows checking at each available range without revealing to the players which ranges are important.

DESCRIBING SENSORS

Sensors are identified by a LongName which provides enough detail to define its usage. A Sensor LongName includes Stage, Range, Sensor Name, and Tech Level.

Stage - Range - Type - Tech Level (C+S)

Elements of the LongName may be omitted if not applicable.

Stage is the sensor's position in the spectrum of sophistication in the developmental life cycle. It is possible for Stage to be blank. For example, Prototype, Basic, or Advanced.

Range is the sensor's distance factor in acquiring information. Space Sensors use Space Ranges. World Sensors use World Ranges. Range in either case uses a term which translates to a range band.

Sensor Name details the precise nature of the mechanism and provides insights into how it operates.

Tech Level identifies the Technological Level at which the Sensor is commonly manufactured. TL is required.

CREATING SENSORS

The abilities and effectiveness of Sensors is determined primarily by Type and Tech Level.

The Sensors available to a ship are determined by the Tech Level of the constructing shipyard (although character may upgrade their ship's sensors as better ones become available).

Similarly, the Sensors available to worlds or bases is determined by its governing tech level.

Space Sensors detect a variety of inputs and process them to provide specific details of location, environment, and friends and enemies.

The Sensor Creation Process

Sensors are selected from the Sensor List and then created in two parts: the Sensor (as modified by Range) and the Bridge Console (as modified by Stage).

1. Base Sensor. Select a Base Sensor Type from the World Sensor List or the Space Sensor List. Note its Model Letter and Tech Level.

The base tonnage for a Sensor is zero tons. The base cost for World Sensor is Cr100,000. The base cost for a Space Sensor is MCr1.

2. Mount. Select a Mount for the Sensor from the Sensor Mounts Table. Note any Mods to the Sensor based on Mount.

3. Range. The Standard Range for Space Sensors is S=7. The Standard Range for World Sensors is R=7. Increase or decrease the base Range using the Range Effects Table and note its consequences (applied to the Mount) for Tech Level, Tonnage, and Cost.

4. Bridge Console. Each Sensor requires a 1-ton Bridge Console. If the Bridge has insufficient consoles, increase Bridge size. The Console holds the Local Computer for the Sensor and its various operator displays.

5. Stage. The base Stage for Sensors is Standard (which need not be stated). Increase or decrease the base Stage using the Stage Effects Table and note its consequences for the Bridge Console Tech Level, Tonnage, and Cost.

Added tons may be located anywhere on the ship (not necessarily on the Bridge).

Note any Mods to the Sensor based on Stage.

SENSOR CREATION EXAMPLE

For example, several Neutrino Detectors are possible.

N-10 Neutrino Detector-10

The standard device at standard tech level; mounted in a hull Surface Mount.

S=7 (per Space Sensors).

Cost= Standard= MCr1 (per Space Sensors).

Console = 1 ton on the Bridge.

Mount = Surface Mount requires no additional tonnage.

The N-10 can detect anything equal to or larger than the benchmark shown on the Sensor Data Chart, but not farther than Maximum Range S=7.

Assuming the Sensor Operator has C4=7 and Sensor-3 and no Mods, the Sensor Task calls for him to roll 7D for (14 + 7 + 3 = 24) or less = about a 50% chance of detecting the target.

ExSRN-6 Experimental SR Bay Neutrino Detector-6

TL= 10 -3 -1 = 6.

S=5.

Cost= MCr1 x10 /2 plus Mount MCr5 = MCr10.

Mount= 50-ton Bay plus 3 tons adjacent to the Bay.

Console = 1-ton Console on the Bridge.

The ExSRN-10 can (attempt to) detect Fusion+ modules at S=5 = 50,000 km or closer. It has a Mod +5 to detect.

Assuming the Sensor Operator has C4=7 and Sensor-3 and Mod + 5, the Sensor Task calls for him to roll 5D for (10 + 7 + 3 +5 = 25) or less = about a 98% chance of detecting the target.

ACTIVE VERSUS PASSIVE

Most sensors are passive. They receive information in some way, but do not emit any information themselves. Passive sensors are difficult to detect.

Some sensors are active. They emit some form of information (they send out a radio pulse, or a laser spot in the course of operation). Active sensors give away their location and the fact that they are operating.

A sensor which can be Active or Passive is automatically Passive unless the operator makes the switch to Active (and receives a Mod +3) but also automatically alerts any operating sensors).

Active Mode can only be used to about S=7.

USING THE SENSOR CHARTS

The Sensor Charts show the various sensors and their capabilities at a wide selection of ranges.

Minimum Size Benchmarks. A sensor can attempt to detect the benchmark shown at the stated range or closer. An object smaller than the benchmark cannot be detected (or attempted to be detected). Mods change the chance of detection, but do not alter the size restrictions.

Maximum Range. Each Sensor has a stated Maximum Range. It cannot attempt detection of objects beyond Maximum Range.

Jammers

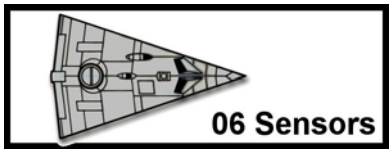
A Jammer produces a Mod against detection by Radar, EMS, or Scanner.

Stealth Mask

A Stealth Mask produces a Mod against detection by Active Radar, EMS, or Scanner.

Sensors

Sensors are the eyes and ears of the ship, or of explorers. They gather information and present it to users in an understandable form. Create sensors as needed from this page.



SENSOR DESCRIPTION

Model	LongName = Stage Range Mount Type -TL (C+S)

The basic information required to describe and use a sensor.

IDENTIFYING SPACE SENSORS

R= or S=
Stage Range Mount Type -TL (C+S)

Early DS Ant Radar -9 (10)

THE SENSOR TASK

		TL	Char	Skill	Mod
nD	**<**	**T**	**+C**	**+S**	**+M**
n = Range			Use: C4 C5	Use: Sensor	Passive Benchmark Mount

Uncertain (1D)

SPACE SENSORS

	Type	TL	Mount	S=	R=	MCr
A	Activity Sensor	11	Surf		7	0.1
B	Deep Radar	9	Surf		7	0.1
C	Communicator	8	Surf	7		1.0
D	Densitometer	10	Surf		7	0.1
E	EMS	12	Ant	7		1.0
F	Field Sensor	12	Surf		7	0.1
G	Grav Sensor	13	Surf	7		1.0
H	HoloVisor	18	Surf	7		1.0
J	Jammer	8	Surf	7		1.0
K	Analyzer / Sniffer	9	Surf		7	0.1
L	Life Detector	10	Surf		7	0.1
M	Mass Sensor	8	Surf		7	0.1
N	Neutrino Detector	10	Surf	7		1.0
P	Proximeter	10	Surf		7	0.1
Q	Stealth Mask	12	Surf	7		1.0
R	Radar	9	Ant	7		1.0
S	Scanner	19	Ant	7		1.0
T	Scope	9	Surf	7		1.0
V	Visor	14	Surf	7		1.0
U						
W	CommPlus	17	Surf	7		1.0
X						
Y	Sound Sensor	10	Surf		7	0.1
Z						

SENSOR MOUNTS

	Mount Type	Tons	Mod	Skill	MCr
T1	Turret	1	0	Sensor	0.2
B1	Barbette	3	+1	Sensor	3.0
De	Deployable	+2		Sensor	3.0
Bay	Bay	50	+5	Sensor	5.0
LBay	Large Bay	100	+8	Sensor	10.0
M	Main	200	+10	Sensor	20.0
Surf	Surface	0	0	Sensor	0.0
(blank)	Surface	0	0	Sensor	0.0
Ant	Antenna	1	+1	Sensor	0.5
Ext	Extendable	2	+3	Sensor	1.0

Sensors may be installed in weapon **Hardpoints** or in Sensor Mounts. Surface, Antenna, or Extendable.

Deployable. In addition to Turret or Barbette costs.

C+S CHARACTERISTIC PLUS SKILL

Characteristic Use C4 or C5.
Skill Use Skill= Sensors.

STAGE EFFECTS **(applies to Sensor)**

	Stage	TL	QREBS	Mod	Tons	Cost
Ex	Experimental*	- 3	Full	-4	+3	x10
Pr	Prototype**	- 2	3 of 5	-3	+2	x3
Er	Early	- 1	1 of 5			x2
	(Standard)	+0				
Im	Improved	+1	+1 of 5			/ 2
Ad	Advanced	+2	+3 of 5	+1		/ 2

Tons in addition to 1-ton Bridge Console; may be anywhere.

SPACE SENSOR RANGE EFFECTS **(applies to Mount)**

S=		Range	TL	S=	Tons	Cost
2	**FR**	Fighter Range	- 2	7		/2
5	**SR**	Short Range	- 1	10		/2
7	**AR**	Attack Range	0	12		
9	**LR**	Long Range	+1	14	+1	x3
12	**DS**	Deep Space	+2	17	+2	x5

WORLD SENSOR RANGE EFFECTS **(applies to Mount)**

R=		Range	TL	R=	Tons	Cost
5	**L**	Long 1000 m	- 2	B		/2
6	**D**	Distant 5 km	- 1	1		/2
7	**Vd**	Vdistant 50 km	0	2		
8	**Or**	Orbit 500 km	+1	3	+2	x3
9	**Fo**	Far Orbit 5000 km	+2	4	+3	x5
10	**G**	Geo 50,000 km	+3	5	+4	x8

Each Sensor requires a 1-ton Console on the Bridge (which also holds its Local Computer) which is not part of the Sensor tonnage. Stage and Range Effects do not apply to Mounts.

Space Sensors

The basic details of available space weapons are shown here.

Space Sensors-1

SENSORS

	Type	TL	Mount
A	Activity Sensor	11	Surf
B	Deep Radar	9	Surf
C	Communicator	8	Surf
D	Densitometer	10	Surf
E	EMS	12	Ant
F	Field Sensor	12	Surf
G	Grav Sensor	13	Surf
H	HoloVisor	18	Surf
I	(not used)		
J	Jammer	8	Surf
K	Analyzer / Sniffer	9	Surf
L	Life Detector	10	Surf
M	Mass Sensor	8	Surf
N	Neutrino Detector	10	Surf
O	(not used)		Surf
P	Proximeter	10	Surf
Q	Stealth Mask	12	Surf
R	Radar	9	Ant
S	Scanner	19	Ant
T	Scope	9	Surf
U			
V	Visor	14	Surf
W	CommPlus	17	Surf
X			
Y	Sound Sensor	10	Surf
Z			

SENSOR MOUNTS

	Mount Type	Mod	Skill
T1	Turret	0	Sensor
B1	Barbette	+1	Sensor
De	Deployable		Sensor
Bay	Bay	+5	Sensor
LBay	Large Bay	+8	Sensor
M	Main	+12	Sensor
Surf	Surface	0	Sensor
(blank)	Surface	0	Sensor
Ant	Antenna	+1	Sensor
Ext	Extendable	+3	Sensor

Sensors may be installed in weapon **Hardpoints** or in Sensor Mounts. Surface, Antenna, or Extendable.

Deployable. In addition to Turret or Barbette costs.

A Activity Sensor

(Electronics. Passive). Activity Sensors detect thought activity (also based on the principles of Perception).

B Deep Radar

(Electronics. Active). Deep Radar is a world sensor. Deep Radar can map underground density structures. It is a lower tech equivalent of Densitometer.

C Communicator

(Electronics. Passive/Active). Communicators (radio) receive and transmit modulated energy to carry information. They carry voice (or any language of any type including tactile and pvoice) and may carry images.

Communicators are line-of-sight devices; they cannot transmit through objects (worlds, planets, stars). Receiving messages is Passive; transmitting messages is Active.

Communicators normally operate in Broadcast mode. The broadcast can be intercepted by any Communicator.

Communicators operating in BeamCast mode must first detect their intended receiver. Range is Maximum Range minus 2. The Beamcast cannot be intercepted (unless the interceptor is in the Beamcast beam.

Communicators operating in Burst Mode compress their message into a very short burst. Interception of a Burst requires resolution of the Sensor Task with double the required dice.

Communicator Operations. A Communicator or CommPlus can receive a Broadcast if it is within the transmitting Communicator's Range.

D Densitometer

(Gravitics. Passive). A Densitometer is a remote Mass Detectors capable of identifying masses and mapping their interior density structures.

Densitometers are subject to a Depth Limit (in World Range). The three-dimensional map created has a resolution expressed in pixels (Px); each pixel is expressed in Size.

E EMS ElectroMagnetic Sensors

(Electronics. Passive/ Active). EMS is a sophisticated form of Radar; its signals are aggressively computer analyzed for detailed information. Passive EMS senses existing EM radiation (including emissions by the target, reflected local energy, and occluded background energy). Active EMS projects radio pulses in sweeping scans of an area and interprets the returned signals (echoes) for information about an objects size, distance, and speed.

F Field Sensor

(Electronics or Magnetics. Passive). Field Sensors are multi-purpose detectors sensitive to electric and magnetic fields. They operate in much the way Awareness operates.

G Grav Sensor

(Gravitics. Passive). The Grav Sensor detects gravity sources (large masses) and the operation Gravitics-based technology (M-Drives and G-Drives).

H HoloVisor

(Photonics. Passive). HoloVisor is the ultimate vision screen system, using external light detectors and displaying them in 3D projection (computer enhancements fill in gaps, extrapolate unseen sides of objects, and maintain a complete image in memory).

J Jammer

(Electronics, Magnetics, Gravitics. Passive). Jammer is an anti-sensor. The device scrambles or distorts the transmissions and readings of other sensors.

The value or effectiveness of Jammer is the sum of (TL + Char + Skill + Mod – Space Range). Jammer is a negative Mod on the attempting Active or Passive **Radar, EMS, or Scanner** Sensor Task, or operation of DataCaster.

Space Sensors

The basic details of available space weapons are shown here.

K Analyzer / Sniffer

(Electronics, Biologics. Passive). The Analyzer detects volatiles in space and (more usually) in atmosphere.

L Life Detector

(Magnetics. Passive). A Life Detector senses the presence of organisms (based on the principles of Perception).

M Mass Sensor

(Gravitics. Passive). A Mass Sensor detects masses. It is a less sensitive version of the Grav Sensor.

N Neutrino Detector (Gravitics.

Passive). Neutrino Detectors sense neutrinos, primarily as the byproduct of fusion reactions: positive readings reflect the presence of stars, starship or world fusion reactors, or nuclear activity.

Because neutrinos are almost impossible to shield, Neutrino Detectors are effective in sensing ships through their Power Plants (although not A-Plants or Collectors). The can also detect Fusion+ modules.

Ships frustrate Neutrino Detectors by turning the Power Plant off, or by approaching with the local star directly behind them.

P Proximeter

(Electronics. Passive). A Proximeter senses objects close to the hull of a starship. It serves as an accurate close-up altimeter, and as an alert device when objects (people) approach.

Q Stealth Mask

(Polymers. Passive). Stealth Mask is a signal absorber. The device (actually an external hull coating) absorbs or diverts Active sensor signals. Stealth Mask can be switched On and Off.

The value or effectiveness of Stealth mask is TL the sum of (TL + Mod – Space Range). Stealth Mask is a negative Mod on the attempting **Active** Sensor Task.

R Radar

(Electronics. Passive/Active). Radar projects radio pulses in sweeping scans of an area and interprets the returned signals (echoes) for information about an objects size, distance, and speed.

S Scanner

(Electronics. Passive/Active). Scanner is an advanced form of Electromagnetic Sensor.

T Scope

(Photonics. Passive). Scope is vision screen with distance and enhancement capabilities. It acquires images and magnifies them for interaction, navigation, and analysis.

V Visor

(Photonics. Passive). Visor is the basic visual sensor. It uses external cameras with telescopic enhancements to view images.

W CommPlus

(Gravitics. Passive/Active). CommPlus is an advanced version of Communicator which uses particles (primarily neutrinos) to carry information. CommPlus can transmit through objects (worlds, planets, stars).

CommPlus is incompatible with Communicators. Neither can receive and transmit to the other system.

CommPlus operate otherwise in the same manner as Communications (Broadcast, Beamcast, Burst).

Y Sound Sensor

(Electronics. Passive). Sound Sensor is an external audio pickup capable of sensing a wide variety of sounds. It operates only in atmosphere (or under water).

MULTIPLE SENSORS

A ship may install any number of sensors, subject only to tonnage restrictions. More than one of a specific sensor (multiples of the same model, or several different models) may be installed for redundancy.

EXTENDABLE SENSORS

Sensors may be mounted on Extendable Stalks.

DEPLOYABLE SENSORS

Sensors may be installed in Deployable Hardpoints; they may be moved and operated at a distance from the ship. Deployable Sensors are installed in the Weapons section.

STANDARD SENSOR PACKAGES

Package	TL	MCr	Components			Consoles	Tons
Standard-9	9	5.5	Surf LR Comm-9	Surf AR Scope-9	Ant AR Radar-9	3	+2
Standard-10	10	5.5	Imp Surf LR Comm-10	Imp Surf AR Scope-10	Ant LR Radar-10	3	+3
Standard-11	11	4.0	Adv Surf LR Comm-11	Adv Surf AR Scope-11	Imp Ant LR Radar-11	3	+3
Standard-12	12	3.5	Adv Surf LR Comm-11	Adv Surf AR Scope-11	Ant AR Scanner-12	3	+2
Standard-13	13	3.0	Adv Surf LR Comm-11	Adv Surf AR Scope-11	Imp Ant AR Scanner-13	3	+2
Standard-14	14	4.5	Adv Surf LR Comm-11	Surf AR Visor-14	Imp Ant LR Scanner-14	3	+3
Standard-15	15	4.0	Adv Surf LR Comm-11	Imp Surf AR Visor-15	Adv Ant LR Scanner-15	3	+3

Each Sensor requires a 1-ton console on the Bridge (which includes its associated Local Computer) and a Mount places somewhere on the hull or on a weapons mount.

Sensor Data-1

Sensors
Near Worlds

				Boarding	Fighter Range		Short Range		
		Space Ranges>		**B**	**1**	**2**	**3**	**4**	**5**
	TL	**Sensor**	Contact	1000 m	5 km	50 km	500 km	5,000 km	50,000 km
A	**11**	**Activity Sensor**		5 Thoughts	**6** Agonies	**7** Deaths	**8** ManyDeaths	|||||||||||||||	|||||||||||||||
B	**9**	**Deep Radar**	Depth= 5 Px=Size-5	Depth=4 Px=Size-6	Depth= 3 Px=Size-7	Depth= 2 Px=Size-7	Depth= 1 Px=Size-7	|||||||||||||||	|||||||||||||||
C	**8**	**Communicator**							
D	**10**	**Densitometer**	Depth= 6 Px=Size-2	Depth=6 Px=Size-3	Depth= 6 Px=Size-4	Depth= 6 Px=Size-5	Depth= 6 Px=Size-6	Depth= 5 Px=Size-7	|||||||||||||||
E	**12**	**EMS**	>>>	>>>	>>>	>>>	>>>	>>>	5 Missile
F	**12**	**Field Sensor**	>>>	>>>	2 Electronics			5 Generators	6 Power Lines
G	**13**	**Grav Sensor**	>>>	>>>	>>>	>>>	>>>	>>>	5 Missile
H	**18**	**HoloVisor**	|||||||||||||||					
I		**(not used)**	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||
J	**8**	**Jammer**	Effect Against Active or Passive Radar, EMS, or Scanner = (Negative Mod = T+C+S+M – S)						
K	**9**	**Analyzer / Sniffer**	Operates on Samples			|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||
L	**10**	**Life Detector**	>>>	>>>	5 People	6 Crowds	7 Herds	8 Forest	Vague
M	**8**	**Mass Detector**	|||||||||||||||	6 Small Craft	7 ACS Ship	8 BCS Ship	9 Rock	10 Large Rock	11 Asteroid
N	**10**	**Neutrino Detector**	|||||||||||||||	-	-	-	-	-	-
O		**(not used)**	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||
P	**10**	**Proximeter**	|||||||||||||||	5 Missile	6 Small Craft	7 ACS Ship	8 BCS Ship	9 Rock	10 Large Rock
Q	**12**	**Stealth Mask**	Effect Against Active Radar, EMS, or Scanner = (Negative Mod = T +M – S)						
R	**9**	**Radar**	|||||||||||||||				5 Missile	6 Small Craft
S	**19**	**Scanner**	|||||||||||||||				3 Book	4 Fusion+
T	**9**	**Scope**	>>>	3 Book	4 Fusion+	5 Missile	6 Small Craft	7 ACS Ship	8 BCS Ship
U			-	-	-	-	-	-	-
V	**14**	**Visor**	>>>	>>>	3 Book	4 Fusion+	5 Missile	6 Small Craft	7 ACS Ship
W	**17**	**CommPlus**	-	-	-	-	-	-	-
X			-	-	-	-	-	-	-
Y	**10**	**Sound Sensors**	>>>	3 Distress	4 Distress !!	5 Gunshots	6 Thunder	7 Explosion	
		World Ranges>	0	5	6	7	8	9	10

Sensor Data-2

As sensor can attempt to detect a benchmark (or any larger object) at the stated range.

Sensors
In Space

			Attack Range		Long Range		Deep Space		
		Space Ranges>	**6**	**7**	**8**	**9**	**10**	**11**	**12**
	TL	**Sensor**	1 ls	2 ls	8 ls	16 ls	3 lm	8 lm. 1 AU	30 lm
A	**11**	**Activity Sensor**	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||
B	**9**	**Deep Radar**	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||
C	**8**	**Communicator**							
D	**10**	**Densitometer**	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||
E	**12**	**EMS**	6 Small Craft	7 ACS Ship	8 BCS Ship	9 Local Hex	10 Terrain Hex	11 Asteroid	12 World Hex
F	**12**	**Field Sensor**	**7** Lightning	8 EMP	9 EMP +	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||
G	**13**	**Grav Sensor**	6 Small Craft	7 ACS Ship	8 BCS Ship	9 Rock	10 Large Rock	11 Asteroid	12 Moon
H	**18**	**HoloVisor**	5 Person	6 Truck	7 Small Craft	8 BCS Ship	9 Local Hex	10 Terrain Hex	11 Asteroid
I		**(not used)**	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||
J	**8**	**Jammer**	Effect Against Sensor = (Negative Mod = T+C+S+M – S)						
K	**9**	**Analyzer / Sniffer**	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||
L	**10**	**Life Detector**	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||
M	**8**	**Mass Detector**	Vague	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||
N	**10**	**Neutrino Detector**				6 Fusion+			9 Power Plant
O		**(not used)**	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||
P	**10**	**Proximeter**	11 Asteroid	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||	|||||||||||||||
Q	**12**	**Stealth Mask**	Effect Against Sensor = (Negative Mod = T+C+S+M – S)						
R	**9**	**Radar**	7 ACS Ship	8 BCS Ship	9 Rock	10 Large Rock	11 Asteroid		
S	**19**	**Scanner**	5 Missile	6 Small Craft	7 ACS Ship	8 BCS Ship	9 Rock	10 Large Rock	11 Asteroid
T	**9**	**Scope**	9 Local Hex	10 Terrain Hex	11 Asteroid	12 World Hex			
U			-	-	-	-	-	-	-
V	**14**	**Visor**	8 BCS Ship	9 Local Hex	10 Terrain Hex	11 Asteroid	12 World Hex		
W	**17**	**CommPlus**	-	-	-	-	-	-	-
X			**-**	**-**	**-**	**-**	**-**	**-**	**-**
Y	**10**	**Sound Sensors**	-	-	-	-	-	-	-
		World Ranges>	11	12	13	14	15	16	17

Space Weapons

Space weapons are produced in many different forms and at many different tech levels, but all have the same goal: to defeat other ships in battles, and to attack targets on worlds.

The broad array of space weapons reflects the many different ways weapon technology can operate. The interplay between weapons and defenses allows for many different weapon use strategies.

UNDERSTANDING SPACE WEAPONS

Space weapons have a focused purpose: to damage or destroy enemy spacecraft, or to damage targets on worlds. Space Weapons fall into four distinct categories or operating principles.

Missiles launch a physical object at the target. Missile Launchers. Slug Throwers, Kinetic Kill Missiles, Ortillery, and Rail Guns. Small Craft as rams fall into this category.

Beams project concentrated energy at the target. Particle Accelerators, Plasma and Fusion Guns, Meson Guns, Lasers, Tractors and Pressors, and Disruptors.

Fields project an area of effect on the target. Stasis, Inducers and Dampers.

Data broadcasts or beamcasts data at the target. CommCaster and DataCasters.

WEAPON TYPES
- **Missiles**
- **Beams**
- **Fields**
- **Data**

IDENTIFYING SPACE WEAPONS

	R= or S=				
Stage	Range	Mount	Type	-TL	(C+S)

Adv LR T1 Msl -11 (10)

Advanced Long Range Single Turret Missile-11 (10)

Space Weapons are identified by a LongName with enough detail to define its usage. The LongName includes:

Stage - Range - Mount - Type - Tech Level (+C+S)

Elements of the LongName may be omitted if not applicable.

Stage is the weapon's position in the spectrum of sophistication in the developmental life cycle. It is possible for Stage to be blank. For example, Prototype, Basic, or Advanced.

Range is the weapon's distance factor in attacking targets. Weapons may use Space Ranges or World Ranges. Range in either case uses a term which translates to a range band.

Mount states the type of weapon mount used with the weapon.

Weapon Name details the precise nature of the mechanism and provides insights into how it operates.

Tech Level identifies the Technological Level at which the Weapon is commonly manufactured. TL is required.

C+S. A weapon identifier may have an additional element indicating the Controlling Characteristic and Skill level of the operator. If the weapon is controlled by a Gunner, Brain or Computer, the applicable C+S is used. C+S is shown as a plus and a number inside parentheses. For example, the operator assigned to a specific weapons installation is C4=7 and Bay Weapons-3; the weapon LongName includes (+10) for the C+S value.

Until an operator for a weapon is assigned, (+C+S) is omitted).

IDENTIFYING MISSILES

Stage	Missile	-Size	Type	Guidance

Missile-5X HW

Missile-5 Explosive Warhead Hard-Wired Guidance

Missiles are a special case and are identified separate from their Launcher. A Missile LongName consists of

Missile - Size - Warhead - Guidance.

When a missile is used, it takes its TL and (C+S) from its Launcher.

Missile is the weapon identifier: it is always the word: Missile.

Size is the Missile's Object Size from 1 to 7. For example, Missile-1 is a Bullet.

Type describes the warhead or attack capability. For example, N is Nuclear.

Guidance is the system which controls the missile and directs it to its target. For example, OG is Operator Guided: the Gunner in the Launcher guides the missile to it target. Such a system may include radar guidance, direct joystick control, or some other means.

The Concept of Missile Includes

Traditional missiles, Bullets, various projectiles, Bombs, Deadfall Ordnance, Metal Slabs launched from Rail Guns, and other systems.

THE MOUNTS

The effectiveness of Space Weapons depends in large part on the size of the Weapon Mount. Space Weapon Mounts are the physical structures in which weapons are installed.

Mounts determine the skill required to operate the weapon, the Mod on the Space Weapon Task, and (in most cases) the Hits the weapon inflicts.

Allocating Mounts

Each Type of Weapon requires a minimum size for its Mount (Minimum Mount as noted in the Space Weapon Types Table).

Mounts may be upgraded. Turrets may be upgraded to larger Turrets or to Barbettes. Bays may be upgraded to Large Bays.

But, Particle Accelerators may be upgraded through all larger Mounts.

Limits On The Number of Mounts. Every hull has one Hardpoint per 100 tons. One Mount may be installed at each Hardpoint. In some cases (Main), the Mount will occupy more than the 100 tons associated with that Hard Point. In some cases (Bay or Large Bay), the Mount will occupy much of the 100 tons associated with the Hard Point.

Mount Power. Mounts are self-contained for battle survivability purposes. They carry their own life support (1 week) and their own power modules. They carry their own operating computer (which is networked to the ship's main computer).

Deployable Mounts

A Deployable Mount is a Mount capable of being launched from (and recovered by) a ship.

Only Turret and Barbette can be made Deployable.

Uses. Deployables have a variety of uses. If a deployed turret is targeted enemy fire, damage is restricted to the Deployable. Deployables detected by Sensors do not betray the location of the ship itself. Deployables can serve as Life Pods.

Operations. It can maneuver under its own power (it has G-Drive= 1-G which restricts it to about 5 km from its ship, or within10 D of a nearby planet S=5 R=10). may be launched from the ship and may maneuver under its own power.

Endurance. Deployables carry life support and power for about two weeks.

Armor. A Deployable Mount is armored the same as the hull.

THE SPACE WEAPON TASK

		TL	Char	Skill	Mod
nD	**<**	**T**	**+C**	**+S**	**+M**
n = Range **(S= or R=)**			Use: C4 C5	Use: Wpn	TSM Mount

A Weapon cannot operate beyond its stated Range.

USING SPACE WEAPONS

Weapons may attack targets which their ship has detected. In some cases, weapons (usually missiles) may be launched without a specific target detected or identified.

Space Weapons attack using the Space Weapon Task.

Range determines the number of Dice rolled to hit.

Technology, Characteristic and Skill, and applicable Mods determines the Target Number. The size of the Space Weapon (based on its weapons mount and applied as a Mod) is a major element of the Space Weapons Task.

The Type of weapon determines which defenses and armors it can ignore and which it must overcome.

If the Hits the target and successfully overcomes any armor and protections, it inflicts damage based the Weapon Mount Size.

The Weapon Type determines the type of damage inflicted.

Typical Mods are Weapons Mount and Target Size Modifier (=Target Size minus Range).

CREATING WEAPONS

The abilities and effectiveness of Weapons is determined primarily by Type and Tech Level.

The Weapons available to a ship are determined by the Tech Level of the constructing shipyard (although characters may upgrade their ship's weapons as better ones become available).

Similarly, the Space Weapons available to worlds or bases is determined by its governing tech level.

The Space Weapon Creation Process

Space Weapons are selected from the Space Weapons List and modified by Stage and Range. Tonnage is rounded to the nearest Ton with minimum of 1 ton for Ships and actual tonnage for Small Craft. Costs are not rounded.

1. Base Weapon. Select a Base Weapon Type from the Space Weapon List. Note its Model Letter and Tech Level.

Note its base cost and base range.

Note the weapons Minimum Mount.

2. Mount. Select a Mount for the Weapon. The original minimum Mount may be used, or it may be upgraded. Mounts below Bay cannot be upgraded above Dual Barbette.

Note the Mount tons, Mod, Hits, and Cost.

3. Range. Increase or decrease the base Range using the Space Weapon Range Effects Table and note its consequences for Tech Level, Tonnage, and Cost.

A Weapon cannot be improved beyond its maximum range (R=10 for World Ranges; S=12 for Space Ranges).

3. Stage. The base Stage for Weapons is Standard. Increase or decrease the base Stage using the Stage Effects Table and note its consequences for Tech Level, Tonnage, and Cost.

4. C+S. If the operator is known, add Characteristic and Skill.

WEAPONS AND WEAPONS EFFECTS

The array of available Space Weapons ranges from the simple to the complex. The following descriptions provide a basic understanding of the principles and realities of the weapons.

The Weapon Charts. Weapons Attacks-1 and -2 show the ranges at which various weapons operate (including maximum range).

Particle Accelerators

Particle Accelerators project subatomic particles in focused beams. Interaction with the target produces physical and radiation damage.

Particle Accelerators operate in two distinct modes: in space and in atmosphere.

In Space. PAs in space use Space Ranges S=. They have an effective range limit of about S=7, beyond which the particle beam is too dissipated to do damage.

In Atmosphere. PAs operating in atmosphere (that is, attacking a target which is in atmosphere) use World Ranges R=, and shed 1D of damage for each layer of atmosphere the beam penetrates.

Theoretically, a Particle Accelerator at S=7 (its maximum possible range) could attack a target on a world surface). It would use R= 12 because the target is in atmosphere, and its particle beam would shed 1D for Range Band of atmosphere it penetrates, typically Bands 1 to 7. A PA Barbette would lose effectiveness before the beam hit the target; a Main Mount could potentially hit and damage the target.

Slug Throwers

Slug Throwers are heavy duty Guns or Gatlings firing Missile-2 Slugs (either solid or explosive).

Although Size-2 Slugs are technically Missiles, Slug Throwers (Code = B) do not appear on the Defenses: AB AM Mode Table under Attacker; they are not subject to Anti-Missile Defenses.

CommCasters

CommCasters are dedicated information and communications links between the ships.

Sensor Data. Two ships, each with CommCasters can share Sensor Data, and each may attack targets sensed by the other.

Virtual Battery Fire. Ships (each equipped with CommCaster) can attack the same target with weapons of the same Type (but not necessarily the same TL or Mount). The hits inflicted by the weapons are summed.

DataCasters

DataCasters spew vast amounts of data at targets attempting to confuse, distract, or overload enemy sensors. Its transmitters are constantly searching across many communications and sensor bands for opportunities to introduce spurious data.

Sensor Overload. Successful DataCaster Attacks on Sensors or Comms inflict Damage on a specific Sensor or Comm.

Successful DataCaster attacks on non-Sensor, non-Comm locations insert a Virus or an Applet (or multiples).

Applet. An Applet produces annoying spoof messages on the control console associated with the Hit Location. The component in that Location receives Mod -1 for operation.

Virus. A Virus successfully introduced onto a ship disables the Component at the Hit Location.

In each successive Combat Round, the Virus may attack an adjacent Hit Location and succeeds if 1D < Computer + Virus.

For example, a Virus is assigned a value = 1D = 3. It attacks an adjacent Hit Location Power Plant controlled by Computer/2. It must roll 1D for 2+3 or less = 5. If successful, that location is disabled.

A Virus is isolated if all computer connections are cut between the Virus disabled locations and all other hit locations. The computers can operate independently; but this step prevents use of batteries and commcasters, and restricts the use of weapons to R=7 or less.

Stasis Projector

A Stasis Projector imposes a series of Stasis Fields (varying in size from 1 cm to 1.5 m) along a line extending from its projector. The fields tend to form around objects; all molecular activity within the field is suspended; time stands still within an active field. The field remains in effect until released. When the field is released, its contents continue unaffected.

However, their connections with the rest of the ship have been severed. The result is a crippling effect on the component Hit Location.

The litter of stasis project or attacks lingers long after the battle. Stasis bubbles filled with battlefield debris can be destabilized with a hand-held Mag Scrambler to reveal their contents: personnel, artifact, ruined equipment, even captured explosions.

Jump Inducer

The Jump Inducer channels the energies of a ship's Jump Drive into disastrous jump-like effect on a target.

The name Jump Inducer is misleading: the weapon induces a misjump of components of a ship. The misjump essentially disintegrates the components.

A Jump Inducer requires an operating on its ship.

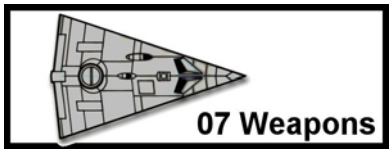
Disruptor

The Disruptor suppresses the charge on the electron. Chemical bonds break; compounds disintegrate. With the electron charge suppressed, atomic nuclei exhibit a positive charge and repel their neighbors, creating an expanding cloud of particles.

The Disruptor is a relatively slow weapon. Focused on a target, it boils away armor layers over the course of minuted. Once out of the Disruptor beam's influence, the electrons' negative charge reasserts itself,

Space Weapons

Space weapons are the offensive tools of starships and spacecraft. They are produced in a variety of types and tech levels. Create weapons as needed from this page.



SPACE WEAPON DESCRIPTION

Model	LongName = Stage Range Mount Type-TL (C+S)

The basic information required to describe and use a space weapon.

IDENTIFYING SPACE WEAPONS

R= or S=

Stage Range Mount Type -TL (C+S)

Adv LR T1 Msl -11 (10)

SPACE WEAPON TYPES

	Space Weapon	TL	Minimum	R=	S=	MCr
A	Particle Accelerator	11	Barbette	7*	7*	2.5
B	Slug Thrower	9	Turret	7		
C	CommCaster	8	Turret		7	
D	DataCaster	10	Turret	7		
E	Stasis	19	Turret	7		
F	Fusion Gun	12	Barbette	7		1.5
G	Meson Gun	13	Main		7	5.0
H	Inducer	18	Turret	7		
I	--- not used ---					
J	Mining Laser	8	Turret	7		0.5
K	Pulse Laser	9	Turret	7		1.0
L	Beam Laser	10	Turret	7		0.5
M	Missile	8	Turret		7	0.2
N	KK Missile	10	Bay		7	3.0
O	--- not used ---					
P	Plasma Gun	10	Barbette	7		1.0
Q	Ortillery	12	Bay	7		
R	Rail Gun	12	Bay		5	
S	SandCaster	9	Turret	7		0.1
T	Jump Damper	14	Barbette	7		
U	Tractor/Pressor	15	Barbette	7		
V	Salvo Rack	10	Bay		7	
W	Disruptor	17	Barbette	7		
X	Hybrid K-S-M	9	Triple Turret*	7		1.5
Y	Hybrid L-S-M	10	Triple Turret*	7		1.0
Z						

Minimum= minimum required mount for this weapon.
* Particle Accelerator uses S= in Space Attacks.
* Only available in this Mount.

C+S CHARACTERISTIC PLUS SKILL

Char	Use C4 or C5.
Skill	Use Skill= Gunner plus Knowledge= Turrets, Bays, Ortillery, or Spines (includes Main). Nuclear Missiles requires Heavy Weapons + WMD in place of any other Skills/Knowledges.

SPACE WEAPON MOUNTS

	Mount Type	Tons	Mod	Hits	Skill	MCr
T1	Single Turret	1	- 3	1	Turret	0.2
T2	Dual Turret	1	- 2	2	Turret	0.5
T3	Triple Turret	1	- 1	3	Turret	1.0
T4	Quad Turret	1		4	Turret	1.5
B1	Barbette	3	0	3	Turret	3.0
B2	Dual Barbette	3	+2	5	Turret	4.0
De	Deployable	+2			Turret	3.0
Bay	Bay	50	+5	10	Bay*	5.0
LBay	Large Bay	100	+8	20	Bay*	10.0
M	Main	200	+10	30	Spine	20.0
S	Spine	Not available for ACS ships.				

*Ortillery and Rail Gun governed by Skill= Ortillery.
Hardpoints. One mount per 100 tons of ship.
Deployable. In addition to Turret or Barbette costs.

STAGE EFFECTS **(applies to Weapon)**

	Stage	TL	QREBS	Mod	Tons	Cost
Ex	Experimental*	- 3	Full	-4	+3	+10
Pr	Prototype**	- 2	3 of 5	-3	+2	+3
Er	Early	- 1	1 of 5			+2
	(Standard)	+0				
Im	Improved	+1	+1 of 5			
Ad	Advanced	+2	+3 of 5	+1		

Install added tons adjacent to the Mount.

WEAPON RANGE EFFECTS S= **(applies to Mount)**

S=		Range	TL	Tons	Cost
2	**FR**	Fighter Range	- 2		/2
5	**SR**	Short Range	- 1		/2
7	**AR**	Attack Range	0		(standard)
9	**LR**	Long Range	+1	+2	x3
12	**DS**	Deep Space	+2	+3	x5

Applies to Bays, Large Bays, and Mains

WEAPON RANGE EFFECTS R= **(applies to Mount)**

R=		Range	TL	Tons	Cost
5	**Vl**	Vlong 1000 m	- 2		/2
6	**D**	Distant 5 km	- 1		/2
7	**Vd**	Vdistant 50 km	+0		(standard)
8	**Or**	Orbit 500 km	+1	+2	x3
9	**Fo**	Far Orbit 5000 km	+2	+3	x5
10	**G**	Geo 50,000 km	+3	+4	x8

Applies to Turrets and Barbettes

Space Missiles

The missiles launched from starships and spacecraft is available in a variety types to suit user needs.

Missiles

MISSILE DESCRIPTION

Model	LongName (Mount) Missile-Size Type Guidance

The basic information required to describe and use a space weapon.

IDENTIFYING MISSILES

Stage Missile -Size Type Guidance

Missile-5X HW

A Missile is identified separately from the launching Mount, it takes its TL and Mod from its Launching Mount and its C+S from its Guidance System.

Missiles include: projectiles, bombs, deadfall ordnance.

SPACE WEAPON TYPES- MISSILE

		Size	Types	Guidance
B	MachineGun	1	S	UG
B	Slug Launcher	2	SX	UG
V	Salvo Rack	3	XE	HW OG
Q	Ortillery	4 5 6	D	UG HW
M	Missile	5	XENYZ	OG HW SA DL
N	KK Missile	6	K	OG HW SA DL
R	Rail Gun	6	X	UG HW

MISSILE TYPES

Missiles are produced in Types SDXENKYZ.

S Slug. Solid metal projectile.

D Deadfall. Solid projectile crafted to survive passage through atmosphere to target.

X Explosive. High explosive charge. Explodes on impact or when very near the target.

E EMP. ElectroMagnetic Pulse to disable electronics.

N Nuke. A nuclear weapon or device.

K Kinetic. Inflicts damage through high velocity impact.

Y Decoy. Appears as SDXENZ (but not KY).

Z Sensor Package. Single-use sensor package.

MISSILE SIZES

Missiles are produced in Sizes 1-2-3-4-5 to Object Size.

MISSILE GUIDANCE

Missiles guidance systems may be:

UG. UnGuided. No guidance system.

HW. Hardwired (5). Circuits direct missile to the target.

OG. Operator Guided (C+S). Gunner directs missile to the target (must be launched from S=2 or less).

SA. Self-Aware (C+S). Missile is controlled by an on-board self-aware Brain.

DL. Down Loaded (C+S). Missile is controlled by the downloaded personality of the Gunner.

MISSILE TYPES AND EFFECTS

				Effects (in D)					
				S	**D**	**X**	**E**	**N**	**K**
Sz	**Missile**	**Type**		Slug	Deadfall	Explosive	EMP	Nuke	Kinetic
1	Missile-1	Bullet	S	Pen= 0					
2	Missile-2	Slug	SX	Pen= 1		Pen= 2			
3	Missile-3	Vsmall Missile	SXE	Pen= 2		Pen= 3	EMP= 3		
4	Missile-4	Small Missile	DXE		ME	Pen= 4	EMP= 4		
5	Missile-5	Missile	DXEN		ME	Pen= 5	EMP= 5	ME	
6	Missile-6	Small Craft	XK		ME	Pen= 6			Pen= 6xSp^2
7	Missile-7	Ship	K		ME				Pen= 7xSp^2

Hits inflicted are in D. For example, Pen-1 inflicts 1D Hits Kinetic = Sp = Speed = Space Range of Attack.

ME= Massive Explosion. Missile-6K is a G-Drive powered Small Craft. Missile-7K is an M-Drive powered Ship.

Massive Explosion **Missile Warhead**

R=	Proximity	Sz-1D	Blast	BFE*	Rad	Burn
0	Direct Hit	5		Vaporized= 100D		
1	Hit	6	90 D	20 D	10 D	30 D
2	Hit	7	40 D	15 D	10 D	20 D
3	Vnear Miss	8	30 D	10 D	10 D	10 D
4	Near Miss	9	10 D	5 D	5 D	5 D
5	Far Miss	10	5 D	1D	1D	1D
6	Miss	11				

* BFE= Bang, Flash, EMP (EMP only with Nukes).

MASSIVE EXPLOSION ADJUSTMENTS

Missiles-4-5-6-7 can inflict Massive Explosion.
Missile-5 is the Benchmark for effects.
Missile-4 inflicts one-tenth damage,
Missile-6 inflicts double damage.
Missile-7 inflicts triple damage
Bang=0 if in space.
Non-Nuke ignore EMP and Rad.
Explosive (not Nuke) inflicts one-tenth damage.
AM Anti-Matter inflicts additional triple damage.

Space Weapons

The brief, basic details and descriptions of available space weapons are shown here.

SPACE WEAPONS

	Type	TL	Mount
A	PAW	11	B1
B	Slug Thrower	9	T1
C	CommCaster	8	T1
D	DataCaster	10	T1
E	Stasis	19	T1
F	Fusion Gun	12	B1
G	Meson Gun	13	Main
H	Inducer	18	T1
I	--- not used ---		
J	Mining Laser	8	T1
K	Pulse Laser	9	T1
L	Beam Laser	10	T2
M	Missile	8	T1
N	KK Missile	10	Bay
O	--- not used ---		
P	Plasma Gun	10	B1
Q	Ortillery	12	Bay
R	Rail Gun	12	Bay
S	SandCaster	9	T1
T	Jump Damper	14	B1
U	Tractor/Pressor	15	B1
V	Salvo Rack	10	Bay
W	Disruptor	17	B1
X	Hybrid K-S-M	9	T3
Y	Hybrid L-S-M	10	T3
Z			

SPACE WEAPON MOUNTS

	Mount Type	Skill
T1	Single Turret	Turret
T2	Dual Turret	Turret
T3	Triple Turret	Turret
T4	Quad Turret	Turret
B1	Barbette	Turret
B2	Dual Barbette	Turret
De	Deployable	Turret
Bay	Bay	Bay*
LBay	Large Bay	Bay*
M	Main	Spine

*Ortillery and Rail Gun governed by Skill= Ortillery.

Deployable. In addition to Turret or Barbette costs.

A PARTICLE ACCELERATOR

Particle Accelerators project subatomic particles in focused beams. Interaction with the target produces physical and radiation damage.

Charged particles travel well in atmosphere but poorly in space. Neutral particles travel well in space but poorly in atmosphere. Particle Accelerators are able to switch their output depending on the target. A PA attacking in space uses S= Space Ranges; attacking targets in atmosphere use R= World Ranges.

A Particle Accelerator. Base TL=11. Minimum Mount= Barbette.

B SLUG THROWER

Slug Throwers are heavy duty Guns or Gatlings firing Missile-2 slugs.

B Slug Thrower. Base TL= 9. Minimum Mount= Single Turret.

May be used in Anti-Missile Mode.

C COMMCASTER

CommCasters are dedicated information and communications links between the ships. Any ship with a CommCaster can share all of its sensor data with any other ship also equipped with a CommCaster (subject to lightspeed delay).

Ships with CommCaster can participate in Battery Fire.

C CommCaster. Base TL= 8. Minimum Mount = Single Turret.

D DATACASTER

DataCasters are offensive weapons broadcasting or beamcasting petabytes of information at or against enemy sensors and communicators. DataCasters pursue three strategies: they attempt to spook or overload sensors, they attempt to introduce viruses into onboard systems through flaws in sensor inputs, and they transmit tailored psychological messages and propaganda.

D DataCaster. Base TL= 10. Minimum Mount = Single Turret.

May be used in Anti-Missile Mode.

E STASIS PROJECTOR

A Stasis Projector imposes a series of Stasis Fields (varying in size from 1 cm to 1.5 m) along a line from its projector. The fields tend to form around objects; all molecular activity within the field is suspended; time stands still within an active field. The field remains in effect until released. When the field is released, its contents continue unaffected.

However, their connections with the rest of the ship have been severed. The result is a crippling effect on the component.

E Stasis Projector. Base TL= 19. Minimum Mount= Single Turret.

May be used in Anti-Missile Mode.

F FUSION GUN

Fusion Guns fire beams of super-heated plasma at their targets and cause damage by their intense heat and kinetic energy. Fusion Guns operate at higher temperatures than Plasma Guns (in which the plasma actually undergoes fusion).

F Fusion Gun. Base TL = 12. Minimum Mount= Barbette.

May be used in Anti-Missile Mode.

G MESON GUN

Meson Guns create Muons and charged Pions and project them in focused beams at near lightspeed toward a target. The speed is calculated to promote particle decay inside the target. The ultimate decay products (electrons and photons) inflict internal damage, having bypassed most defenses.

G Meson Gun. Base TL= 13. Minimum Mount= Main Weapon.

H JUMP INDUCER

A Jump Inducer projects a field which initiates Jump on a target component. The raw nature of the attack almost always creates a Misjump: transporting the target to a random location, usually in pieces.

A Jump Inducer requires a Jump Drive installed on its ship.

H Jump Inducer. Base TL= 18. Minimum Mount= Single Turret.

Space Weapons

The brief, basic details and descriptions of available space weapons are shown here.

J MINING LASER

The Mining Laser is an industrial strength Laser system created for asteroid mining. It primary use is slicing nickel iron asteroids at relatively close ranges.

J Mining Laser. Base TL= 8. Minimum Mount= Single Turret.

May be used in Anti-Missile Mode.

K PULSE LASER

Laser weapons fire concentrated beams of energy at their targets and cause damage through intense heat.

The Pulse Laser is a weaponized Mining Laser with improved power and range. It fires in intermittent pulses rather than continuous beams.

K Pulse Laser. Base TL= 9. Minimum Mount= Single Turret.

May be used in Anti-Missile Mode.

L BEAM LASER

The Beam Laser is the standard starship Laser weapon. It fires in continuous beams to inflict greater damage.

L Beam Laser. Base TL= 10. Minimum Mount= Single Turret.

May be used in Anti-Missile Mode.

M MISSILE

Missile systems launch Size-5 (roughly person size) Missiles at targets. The Missile itself (independently described) travels to the target and inflicts damage.

M Missile Launcher (or just Missile). Base TL= 8. Minimum Mount = Single Turret.

May be used in Anti-Missile Mode.

N KINETIC KILL MISSILE

The KK Missile Launcher is a dedicated Launcher for Size-6 (roughly vehicle size) missiles. The Missile itself (independently described) travels to the target and inflicts damage.

N KK Missile Launcher (or just KK Missile). Base TL= 10. Minimum Mount = Bay.

May be used in Anti-Missile Mode.

P PLASMA GUN

Plasma Guns fire beams of super-heated plasma at their targets and cause damage by their intense heat and kinetic energy (but the temperatures do not reach fusion levels).

P Plasma Gun. Base TL = 10. Minimum Mount= Barbette.

May be used in Anti-Missile Mode.

Q ORTILLERY

Ortillery (Orbital Artillery) systems launch a variety of Deadfall Ordnance (unpowered Size 4-5-6 Missiles) from near planet locations for attacks against world surface targets.

Q Ortillery. Base TL = 12. Minimum Mount= Bay.

R RAIL GUN

Rail Guns launch a variety of Size-6 Missiles at strategic world surface and orbital targets.

Rail Guns operate in remote regions of a system (usually planetoid belts or small moons) where they fabricate the bodies of their Missiles on-site (hardly more than slabs or billets of nickel-iron) and add guidance systems.

R Rail Gun. Base TL = 12. Minimum Mount= Bay.

S SANDCASTER

Sandcasters project clouds of sand (small crystalline particles) which obstruct incoming beam weapons.

Sandcaster is not technically a weapon; it is a defense.

S Sandcaster. Base TL= 9. Minimum Mount= Single Turret.

May be used in Anti-Laser Mode.

T JUMP DAMPER

A Jump Damper inflates the Diameter effect of a ship; ships within this enlarged field are prevented from initiating jump.

Although the system is mounted in a Barbette, its effect is spherical centered on the ship.

T Jump Damper. Base TL= 14. Minimum Mount= Barbette.

U TRACTOR/PRESSOR

Tractors and Pressors (they are reversed polarity versions of the same thing) are grav based remote manipulators. Each is capable of applying pressure (tractors pull an object toward it; pressors push an object away from it; each is capable of applying some lateral pressure).

U Tractor/Pressor. Base TL= 15. Minimum Mount= Barbette.

V SALVO RACK

A salvo Rack launches groups (salvos) of Size-3 missiles at a target.

V Salvo Rack. Base TL= 10. Minimum Mount = Bay.

W DISRUPTOR

The Disruptor suppresses the charge on the electron, breaking the chemical bonds which create molecules. The process creates a positively charged cloud of atomic nuclei which rapidly expands.

The (suppressed charge) neutral electrons regain their charge once out of the Disruptor beam and reattach to the positively charged nuclei.

Disruptors boil off armor in layers.

W Disruptor. Base TL= 16. Minimum Mount= Barbette.

X HYBRID K-S-M

Hybrid-X is a triple turret equipped with a Pulse Laser, a SandCaster, and a Missile Launcher.

In any turn, the turret may use any one of its weapons; the other two are not available

X Hybrid K-S-M. Base TL = 9. Required Mount= Triple Turret.

Y HYBRID L-S-M

Hybrid-Y is a triple turret equipped with a Beam Laser, a SandCaster, and a Missile Launcher.

In any turn, the turret may use any one of its weapons; the other two are not available.

X Hybrid K-S-M. Base TL = 10. Required Mount= Triple Turret.

Weapon Attacks-1

Space Weapons may attack previously detected targets which are at ranges allowed by this chart.

Weapons
Near Worlds

<table>
<tr><td colspan="3">NEAR WORLD BIG WEAPONS</td><td></td><td>1000 m</td><td>5 km</td><td>50 km</td><td>500 km</td><td>5000km</td><td>50,000 km</td></tr>
<tr><td colspan="3"></td><td>Contact</td><td>Vlong</td><td>Distant</td><td>Vdistant</td><td>Orbit</td><td>Far Orbit</td><td>Geo</td></tr>
<tr><td colspan="3">S= Space Ranges</td><td></td><td>B</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr>
<tr><td colspan="3"></td><td></td><td>Boarding</td><td colspan="2">Fighter Range</td><td colspan="3">Short Range</td></tr>
<tr><td>A</td><td>11</td><td>PA (see Note)</td><td>||||||||||||||||||</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>C</td><td>8</td><td>CommCaster</td><td>||||||||||||||||||</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>G</td><td>13</td><td>Meson Gun</td><td>||||||||||||||||||</td><td>||||||||||||||||||</td><td>||||||||||||||||||</td><td>||||||||||||||||||</td><td>||||||||||||||||||</td><td>||||||||||||||||</td><td>||||||||||||||||||</td></tr>
<tr><td>M</td><td>8</td><td>Missile</td><td>||||||||||||||||||</td><td>||||||||||||||||||</td><td colspan="2">[- - - - AM Mode - - - -]</td><td colspan="3">Resolved In Next Turn</td></tr>
<tr><td>N</td><td>10</td><td>KKM</td><td>||||||||||||||||||</td><td>||||||||||||||||||</td><td>||||||||||||||||||</td><td>||||||||||||||||||</td><td colspan="3">Resolved In Next Turn</td></tr>
<tr><td>R</td><td>12</td><td>Rail Gun</td><td>||||||||||||||||||</td><td>||||||||||||||||||</td><td></td><td></td><td colspan="3">Resolved In Next Turn</td></tr>
<tr><td>V</td><td>10</td><td>Salvo Rack</td><td>||||||||||||||||||</td><td>||||||||||||||||||</td><td colspan="2">[- - - - AM Mode - - - -]</td><td colspan="3">Resolved In Next Turn</td></tr>
</table>

<table>
<tr><td colspan="3">NEAR WORLD SMALL WEAPONS</td><td>Contact</td><td>1000 m</td><td>5 km</td><td>50 km</td><td>500 km</td><td>5000km</td><td>50,000 km</td><td></td></tr>
<tr><td colspan="3"></td><td></td><td>Vlong</td><td>Distant</td><td>Vdistant</td><td>Orbit</td><td>Far Orbit</td><td>Geo</td><td></td></tr>
<tr><td colspan="3">R= World Ranges></td><td></td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td></td></tr>
<tr><td></td><td>TL</td><td>Weapon</td><td></td><td>Boarding</td><td colspan="2">Fighter Range</td><td colspan="3">Short Range</td><td></td></tr>
<tr><td>B</td><td>8</td><td>Slug Launcher</td><td colspan="4">[- - - - - - - - - - - - - - AM Mode - - - - - - - - - - - -]</td><td></td><td></td><td></td><td rowspan="16">Weapons On this Chart Do Not Reach Beyond R=10</td></tr>
<tr><td>D</td><td>10</td><td>DataCaster</td><td colspan="4">[- - - - - - - - - - - - - - AM Mode - - - - - - - - - - - -]</td><td></td><td></td><td></td></tr>
<tr><td>E</td><td>19</td><td>Stasis</td><td colspan="4">[- - - - - - - - - - - - - - AM Mode - - - - - - - - - - - -]</td><td>||||||||||||||||||</td><td>||||||||||||||||</td><td>|||||||||||||</td></tr>
<tr><td>F</td><td>10</td><td>Fusion Gun</td><td colspan="4">[- - - - - - - - - - - - - - AM Mode - - - - - - - - - - - -]</td><td></td><td></td><td></td></tr>
<tr><td>H</td><td>18</td><td>Jump Inducer</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>J</td><td>8</td><td>Mining Laser</td><td colspan="4">[- - - - - - - - - - - - - - AM Mode - - - - - - - - - - - -]</td><td></td><td>||||||||||||||||</td><td>|||||||||||||</td></tr>
<tr><td>K</td><td>9</td><td>Pulse Laser</td><td colspan="4">[- - - - - - - - - - - - - - AM Mode - - - - - - - - - - - -]</td><td></td><td></td><td></td></tr>
<tr><td>L</td><td>10</td><td>Beam Laser</td><td colspan="4">[- - - - - - - - - - - - - - AM Mode - - - - - - - - - - - -]</td><td></td><td></td><td></td></tr>
<tr><td>P</td><td>10</td><td>Plasma Gun</td><td colspan="4">[- - - - - - - - - - - - - - AM Mode - - - - - - - - - - - -]</td><td></td><td></td><td></td></tr>
<tr><td>Q</td><td>12</td><td>Ortillery</td><td>||||||||||||||||||</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>S</td><td>9</td><td>SandCaster</td><td colspan="4">[- - - - - - - - - - - - - - AL Mode - - - - - - - - - - - -]</td><td></td><td></td><td></td></tr>
<tr><td>T</td><td>14</td><td>Jump Damper</td><td colspan="4">Creates 100D Field</td><td></td><td>||||||||||||||||</td><td>|||||||||||||</td></tr>
<tr><td>U</td><td>15</td><td>Tractor/Pressor</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>W</td><td>16</td><td>Disruptor</td><td colspan="4">[- - - - - - - - - - - - - - AM Mode - - - - - - - - - - - -]</td><td></td><td></td><td></td></tr>
<tr><td>X</td><td>9</td><td>Hybrid K-S-M</td><td colspan="4">[- - - - - - - - - - - - - - AB AM Mode - - - - - - - - - - - -]</td><td></td><td></td><td></td></tr>
<tr><td>Y</td><td>9</td><td>Hybrid L-S-M</td><td colspan="4">[- - - - - - - - - - - - - - AB AM Mode - - - - - - - - - - - -]</td><td></td><td></td><td></td></tr>
</table>

|||||||||= Attack Not Possible. **Particle Accelerators:** Use S= for Space Targets; use R= for targets in Atmosphere.

Weapon Attacks-2

Space Weapons may attack previously detected targets which are at ranges allowed by this chart.

Weapons
In Space

		LONG RANGE	1 ls	2 ls	8 ls	16 ls	3 lm	8 lm	30 lm
		BIG WEAPONS	250,000km	500,000km	2.5 million	5 million	50 million	150 million	500 million
S=		**Space Ranges**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
TL		**Weapon**	Attack Range		Long Range		Deep Space		
A	**11**	PA (see Note)				|||||||||	|||||||||	|||||||||	|||||||||
C	**8**	CommCaster						|||||||||	|||||||||
G	**13**	Meson Gun						RINT	|||||||||
M	**8**	Missile	Launched at start of Battle. Attack occurs in Turn = Space Range.						
N	**10**	KKM	Launched at start of Battle. Attack occurs in Turn = Space Range.						
R	**12**	Rail Gun	Cannot participate in a Battle at this Range.						
V	**10**	Salvo Rack	Attack occurs in Turn = Space Range.			|||||||||	|||||||||	|||||||||	|||||||||
		World Ranges>	**11**	**12**	**13**	**14**	**15**	**16**	**17**
			Satellite						

Launched at start of Battle. Assumes the combatant has preplanned attacks. Resolved in Turn number equal to S.
RINT. Resolved In Next Turn. ||||||||| = Attack Not Possible.
Particle Accelerators: Use S= for Space Targets; use R= for targets in Atmosphere.

		OPERATING RANGES	Contact	1000 m	5 km	50 km	500 km	5000km	50,000 km
		FOR DEFENSES		Vlong	Distant	Vdistant	Orbit	Far Orbit	Geo
R=		**World Ranges>**		**5**	**6**	**7**	**8**	**9**	**10**
TL		Defense		Boarding	Fighter Range		Short Range		
G	**11**	Meson Screen		Exp and Pro	Early	Standard	Improved	Advanced	|||||||||
N	**12**	Nuclear Damper	Exp and Pro	Early	Standard	Improved	Advanced	|||||||||	|||||||||
Q	**14**	Mag Scrambler	Exp and Pro	Ear and Std	Imp and Adv	|||||||||	|||||||||	|||||||||	|||||||||
R	**19**	Proton Screen	Exp and Pro	Early	Standard	Imp and Adv	|||||||||	|||||||||	|||||||||
T	**16**	Black Globe	Standard and Earlier	Improved and Advanced	|||||||||	|||||||||	|||||||||	|||||||||
U	**20**	White Globe			|||||||||	|||||||||	|||||||||	|||||||||
W	**17**	Grav Scrambler	Exp and Pro	Ear and Std	Imp and Adv	|||||||||	|||||||||	|||||||||	|||||||||

This table shows the size of the protective field created by the defense. The attacking weapon resolves the Absolute Mode Defense Task when it enters the range band at the edge of the protective field.

TL		Defense	Affects
G	**11**	Meson Screen	Meson Gun
N	**12**	Nuclear Damper	Nukes
Q	**14**	Mag Scrambler	Stasis Projector. Magnetics. Anti-Matter
R	**19**	Proton Screen	Anti-Matter
T	**16**	Black Globe	All
U	**20**	White Globe	All
W	**17**	Grav Scrambler	Jump Damper, Jump Inducer, J-Drive, M-Drive, G-Drive

Space Defenses and Armor

A starship defends itself with a variety of systems each designed to reduce or eliminate an attack before it can inflict damage.

Space defenses include active systems (which attack incoming weapons) and passive systems (which reduce or block the force of attacks). Each has its place, and a well-designed starship has a variety of defenses.

UNDERSTANDING SPACE DEFENSES

Space defenses are designed to reduce or eliminate attacks.

Active Systems. Some space weapons have defensive abilities; for example, a laser turret may attack and destroy incoming missiles. Active systems are space weapons previously created which are assigned defensive roles.

Passive Systems. Passive defense systems block attacks, usually by interposing sum effect which interferes with the attacking system. For example, a Meson Screen blocks the effects of a Meson Gun.

Armor. The oldest form of defense is Armor. Ships may be equipped with layers of defensive armor to block attacks (and to block natural effects such as temperature or pressure).

IDENTIFYING SPACE DEFENSES

Space Defenses can be identified by Name, LongName, Letter, or Model.

By Name. Defenses carry simple names that generally identify the principle or purpose.

By Letter. Each Defense is assigned a single letter identifier. This letter suffices as an abbreviation when additional information is not required. For example, Nuclear Damper is N.

By LongName. Specifically created Defenses are given a LongName which includes its stage, type and other information. For example, an Advanced Nuclear Damper-14.

By Model. Abbreviations for the elements of the LongName are used to create the Model of a specific Defense. For example, ImpN-14.

USING SPACE DEFENSES

Defenses function in reaction to an attack.

Active Defenses which have been assigned an AB Anti-Beam Mode or AM Anti-Missile Mode respond to such attacks.

Absolute Defenses are interposed between the attacker and the target (the ship). Each related attack must pass through its Absolute Defenses before it may attack the ship.

For example, a G Meson Screen is an Absolute Defense against a meson Gun attack. Every Meson Gun shot must successfully pass through the Meson Screen before reach the target.

Armor is the last line of defense: any attack which has passed through Active and Passive Defenses finally attacks the ship's Armor. If that Armor is penetrated, damage is inflicted on the Target.

THE MOUNTS

Mounts are the physical structures in which defenses are installed.

Weapons As Defenses. Some weapons may be used as in the defensive Anti-Beam mode or the defensive Anti-Missile mode. They operate from their standard weapons mounts.

Defense Mounts

Absolute Mode Defenses may be installed in two different types of Mount: Internal or Bolt-In.

An **Internal Mount** is a location within the hull for the defensive mechanism. It is created during ship design specifically for the Defense.

A **Bolt-In Mount** is a retrofit location for the installation of a Defense at some point after construction.

Consoles

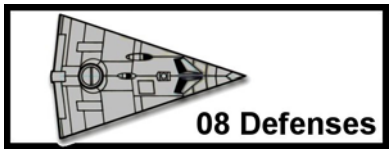
The operating position for a Defense is its Console.

The operating position for weapons used in defense is the weapon crew position (the turret or weapons mount).

Each Absolute Mode Defense requires a 1-ton Console on the Bridge. The console contains the Local Computer for the Defense and a display for the operator.

Space Defenses

Space defenses are creates to reduce or stop the effects of space weapons. Like space weapons, they are produced in a variety of types and tech levels. Create defenses as needed from this page.



SPACE DEFENSE DESCRIPTION

Model	LongName = Stage- Defense -TL (C+S)

The basic information required to describe and use a space defense.

IDENTIFYING SPACE DEFENSES

Stage	Defense	-TL	(C+S)
Imp	**Nuclear Damper**	**-11**	**(10)**

SPACE DEFENSES

	Space Defenses	TL	Absolute Mode vs	MCr
G	Meson Screen	11	G	1.0
N	Nuclear Damper*	12	Nukes	1.0
Q	Mag Scrambler	14	E Magnetics	1.0
R	Proton Screen	19	AM	1.0
T	Black Globe	16	-all-	4.0
U	White Globe	20	-all (except D)	10.0
W	Grav Scrambler	17	H T Gravitics	2.0
Z				

* Nuclear Damper requires TWO separate Mounts.
** Vs Weapon (but not its fire).

SPACE DEFENSE MOUNTS

	Mount Type	Tons	Mod	Skill	MCr
In	Internal	1	+1	Screens	0.5
Bo	Bolt-In	2	-1	Screens	0.5
	Console	1		Screens	0.0

Each Absolute Mode Defense requires an Internal or Bolt-In Mount (anywhere in the ship) and a Console (on the Bridge).

SPACE WEAPONS DEFENSE MODE

		Space Defenses	TL	Mode	Skill
>	**B**	Slug Launcher	9	AM	Use: Weapon Mount skill, or may use Screens
>	**D**	DataCaster	10	AM	
>	**F**	Fusion Gun	12	AM	
>	**J**	Mining Laser	8	AM	
>	**K**	Pulse Laser	9	AM	
>	**L**	Beam Laser	10	AM	
>	**M**	Missile	8	AM	
>	**P**	Plasma Gun	10	AM	
>	**S**	SandCaster	9	AB	
>	**V**	Salvo Rack	10	AM	
>	**X**	Hybrid K-S-M	9	AB AM	
>	**Y**	Hybrid L-S-M	10	AB AM	

Weapons are installed under Weapons but may be used in Defense Modes.

STAGE EFFECTS

	Stage	TL	QREBS	Mod	Tons	Cost
Ex	Experimental*	- 3	Full	-4	x3	+10
Pr	Prototype**	- 2	3 of 5	-3	x2	+3
Er	Early	- 1	1 of 5			+2
St	(Standard)	+0				
Im	Improved	+1	+1 of 5			
Ad	Advanced	+2	+3 of 5	+1		

Tons applies to Mount for non-Weapons.

GLOBES

A Globe absorbs cumulative Damage not to exceed:

Hull Tons x Jump Drive Potential

Overload. If Damage exceeds this value, the Black Globe Generator is destroyed and the Jump Drive is Destroyed.

Ejecting Accumulated Energy. A ship may eject accumulated energy by Jumping, or venting Energy = Hulls Tons per Turn.

DEFENSE ABSOLUTE MODE

Attacker		Defender
T+C+S+M	**<**	**T+C+S+M**
G	<	G
Nuke.M-5N	<	N
E	<	Q
AM	<	RQ
-all-	<	T
all (but D)	<	U
HT G*M*	<	W

Attack fails if Attacker T+C+S+M is less than Defender T+C+S+M.

* G-Drive or M-Drive.

DEFENSE AB AM MODES

Attacker		Defender
1D	<	Mount
	<	1 = T1
	<	2 = T2 B1
	<	3 = T3
	<	4 = T4 B2
	<	5 = Bay
	<	6 = LBay
	<	7 = Main
AFJKLPW	<	S
MNQRV	<	BFGJKL

Defender is a Weapon Mount. Defender rolls equal or less on 1D to stop the attack.

Space Defenses

The basic details of available space defenses are shown here.

SPACE DEFENSES

	Space Defenses	TL
G	Meson Screen	11
J	Jammer *	11
N	Nuclear Damper	12
Q	Mag Scrambler	14
R	Proton Screen	19
T	Black Globe	16
U	White Globe	20
W	Grav Scrambler	17
Z		

SPACE DEFENSE MOUNTS

	Mount Type	Skill
In	Internal	
Bo	Bolt-In	
	Console	Screens

Each Absolute Mode Defense requires an Internal or Bolt-In Mount (anywhere in the ship) and a Console (on the Bridge).

G MESON SCREEN

The Meson Screen interacts with all incoming high energy particles and disrupts their rate of decay: some decay instantly and harmlessly expend their energy; others do not decay and pass harmlessly through the ship.

G Meson Screen. Base TL = 11.

N NUCLEAR DAMPER

The Nuclear Damper creates an interference field which manipulates the Strong nuclear force causing nuclei to shed neutrons. The effect prevents nuclear explosions.

The Nuclear Damper requires dwo separate Mounts installed at different locations on the ship.

N Nuclear Damper. TL=12.

Q MAG SCRAMBLER

The Mag Scrambler interrupts magnetic effects in mechanisms.

It specifically counters the operation of the E Stasis Projector (A Stasis Field cannot be established around an operating Mag Scrambler).

The Mag Scrambler's interference with magnetic fields disrupts the protective encapsulating magnetic field around Anti-Matter. The Defense is used against Anti-Matter missile warheads.

Q Mag Scrambler. TL= 14.

R PROTON SCREEN

The Proton Screen is a defense field which interacts with anti-matter warheads.

R Proton Screen. TL = 19.

T BLACK GLOBE

The Black Globe generator produces an impenetrable black enveloping globe around its mechanism. Matter cannot penetrate the globe, and energy (including impact energy) is absorbed (the lack of reflection provides the characteristic black appearance).

The disadvantage of the Black Globe is that a ship is unable to use any sensors while the Black Globe is operational.

A Black Globe can absorb cumulative Damage equal to:

Hull Tons x Jump Drive Potential.

T Black Globe. TL= 16.

U WHITE GLOBE

The White Globe generator is an advanced version of the Black Globe generator.

The White Globe adds an ability to **flicker** the field so that sensors can be used, and the field reradiates absorbed energy immediately (creating the characteristics glowing white appearance).

A White Globe can absorb cumulative Damage equal to:

Hull Tons x Jump Drive Potential.

U White Globe. TL 20.

W GRAV SCRAMBLER

The Grav Scrambler interferes with the operating principles of Jump, Maneuver, and Gravitic drives.

It is a defense against Jump Projector and Jump Damper, and it prevents the operation of Maneuver and Gravitic drives within its operational field.

W Grav Scrambler. TL 17.

Starship Armor

Starship hulls are constructed from the materials commonly available at the building Tech Level.

Starship Armor

IDENTIFYING SPACE ARMOR

Layers Stage Armor AV (TL)

Triple Std LiteMetal-9 (TL-15)

ARMOR PROTECTS

Starship hulls have a protective armor value. A hull may be made of any armor available at the TL of the building starport.

Armor is applied in layers. The first layer (at hull TL) is automatic and cost is included in the cost of the hull.

Additional Armor Layers

Hulls A-B-C-D-E-F-G-H-J = 1 ton
Hulls K-L-M-N-P-Q-R-S-T = 2 tons
Hulls U-V-W-X-Y-Z = 3 tons
per layer, per 100 tons of Hull.

ARMOR TYPES

TL	Type		Pen	Rad	Blast	Heat
7	Armor-1					
8	Ceram-2			**/2**		
9	Organic-3	**SH**				
10	Dense-4	**LT/2**		**x2**		
11	Polymer-5	**SH**				**/2**
12	Charged-6					
13	SDense-7	**LT/3**		**x3**		
14	Kinetic-8				**x2**	
15	LiteMetal-9					
16	VliteMetal-10					
17	Hullmetal-11					
18	Geneered-12	**SH**		**/2**		
19	Hydrogen-13			**x2**		
20	Strange-14		**x3**			
7	Composite-1		**x2**			
10	Crystaliron-4					

SH= Self Healing. **LT**= Layer Tonnage.

AVAILABLE ARMOR TYPES

TL	Experimental	Prototype	Early	Standard	Improved	Advanced	HullSteel
4	Armor-1 (/3)						
5	Ceram-1 (/3)	Armor-1 (/2)					
6	Organic-1 (/3)	Ceram-1 (/2)	Armor-1				
7	Dense-1 (/3)	Organic-2 (/2)	Ceram-2	Armor-1			
8	Polymer-2 (/3)	Dense-2 (/2)	Organic-3	Ceram-2	Armor-3		HullSteel-1
9	Charged-2 (/3)	Polymer-3 (/2)	Dense-4	Organic-3	Ceram-4	Armor-5	HullSteel-2
10	SDense-2 (/3)	Charged-3 (/2)	Polymer-5	Dense-4	Organic-5	Ceram-6	HullSteel-3
11	Kinetic-3 (/3)	SDense-4 (/2)	Charged-6	Polymer-5	Dense-6	Organic-7	HullSteel-4
12	LiteMetal-3 (/3)	Kinetic-4 (/2)	SDense-7	Charged-6	Polymer-7	Dense-8	HullSteel-5
13	VliteMetal-3 (/3)	LiteMetal-5 (/2)	Kinetic-8	SDense-7	Charged-8	Polymer-9	HullSteel-6
14	Hullmetal-3 (/3)	VliteMetal-5 (/2)	LiteMetal-9	Kinetic-8	SDense-9	Charged-10	HullSteel-7
15	Geneered-4 (/3)	Hullmetal-6 (/2)	VliteMetal-10	LiteMetal-9	Kinetic-10	SDense-11	HullSteel-8
16	Hydrogen-4 (/3)	Geneered-6 (/2)	Hullmetal-11	VliteMetal-10	LiteMetal-11	Kinetic-12	HullSteel-9
17	Strange-5 (/3)	Hydrogen-7 (/2)	Geneered-12	Hullmetal-11	VliteMetal-12	LiteMetal-13	HullSteel-10
18		Strange-7 (/2)	Hydrogen-13	Geneered-12	Hullmetal-13	VliteMetal-14	HullSteel-11
19			Strange-14	Hydrogen-13	Geneered-14	Hullmetal-15	HullSteel-12
20				Strange-14	Hydrogen-15	Geneered-16	HullSteel-13
21					Strange-16	Hydrogen-17	HullSteel-14
AV	AV=TL-6-			TL-6			=TL-7
KCr	TL x 10	TL x 3	TL x2	TL	TL /2	TL /2	TL /2
	Full QREBS	3 of 5 QREBS	1 of 5 QREBS		+1 of 5 QREBS	+3 of 5 QREBS	QREBS=0

* Per 100 hull tons. For layers after the first. (/3) = Three layers required. (/2) = Two layers required.

Space Combat

Conflicts in space, between starships and spacecraft, is resolved using the Traveller Space Combat System.

Space Combat resolves conflict between the full range of spacecraft, starships, and small craft based on the weapons and defenses used, the decisions of the commanders involved, and some measure of chance. Combat is based on coarse variable scales which give a feeling of authenticity without slavish adherence to exact formulas. Distance is a coarse set of approximate ranges. Time is a coarse measure of passing time. Size is an approximation of the relative size of objects and targets.

Finally, the **Traveller Space Combat System (TSCS)** assumes that many shots and many attacks are taking place, but many attacks go wild and come to nothing: the misses are unimportant; the hits are what count. The system also assumes that there are lulls in the action which characters wait or think or catch their breath. The TSCS accomplishes all of these realistic elements without burdening the players with arbitrary or constraining rules.

THE ELEMENTS OF A FIGHT

Space Combat includes the following elements:

The Situation

The situation is an encounter. One or both sides have goals and the situation dictates that violence will be used to resolve the conflict.

The encounter is defined by:

The Participants. Participants are ships. Some are operated by, or commanded by, player-characters. The opposition consists of ships operated by non-player characters controlled by the referee.

The Ships Themselves. The specific ships are predefined starships or spacecraft created using the ACS Adventure Class Ship design system. Each ship requires a ShipSheet with the information necessary for resolving combat. The participants are defined along with the weapons, armor, and protection they are using or have available.

The Terrain. The situation defines the star system and its worlds as they apply to the encounter. It also defines local bases and local forces which may participate or interfere in the battle.

The Search

Starships are constantly searching with their sensors for possible threats of dangers. This search is routine and always in process. When the search sensors register unknown ships (or known hostile ships) the search converts to a potential battle.

The Battle

The ships attack, defend, move, and otherwise act to resolve the encounter in a series of Rounds.

In a Round, every ship has the opportunity to attack other ships, to defend against their attacks, and to move.

The Rounds continue until one side is defeated or has fled the battlefield.

The Aftermath

Once the fight is over, participants resolve the consequences of their actions: gathering the dead, helping the wounded, occupying the territory they have won, or fleeing the enemy to a place of safety.

SCALE

Space Combat is based on variable distance in Space Range Bands, variable time in Rounds, and approximate Size for Ships.

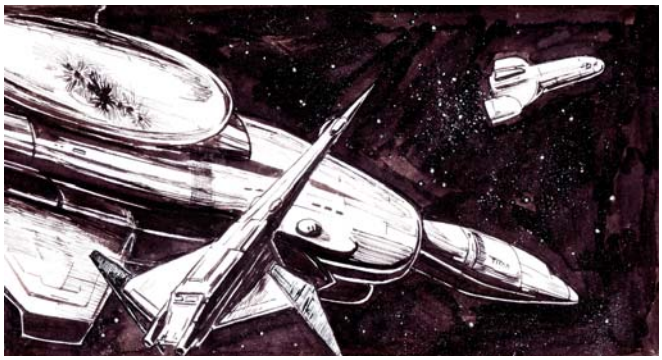
Distance Scale

Ranges in Space are tracked using Space Range Bands. Each Band is numbered and corresponds to a specific physical distance and to a benchmark object.

For example, Space Range Band 2 (S=2) represents a distance of approximately 50 kilometers. Its benchmark is a Starship perhaps 30 to 70 meters long.

Time Scale

Combat is in Rounds approximately 20 minutes long.



TYPES OF SHIPS

The **Traveller Space Combat System** resolves conflict between Adventure Class Ships: starships created using the ACS Design System.

Adventure Class Ships range in size from 100 tons to 2400 tons and operate singly or in small units (squadrons) of several ships each. The mix of available ships includes both starships and spacecraft, and both ships and small craft.

Battle Class Ships are larger than 2400 tons and are created using the BCS Design System. BCS ships operate in fleets and squadrons and include some small ships only where necessary.

How Search Works

AN OVERVIEW

Standard Operating Procedure SOP defines how a ship uses its Sensors. Sensors may detect enemy (or potentially enemy) ships. When one is detected, Alert Status changes and the Battle begins.

THE STATUS BOARD

No	Color	Name	Power	Status	Sensors	Network	Weapons
0	White	Off	External.	Inoperable	Off	External	Off
1	Grey	Preparing	Internal.	In 12 Hours	Off	External	Off
2	Blue	Ready	Internal	Operable	Passive	External	Off
3	Green	Operating	Internal	In Flight	Active	Internal	Auto Response.
4	Orange	Warning	Internal	Attack Possible	Passive	Internal	Auto Response.
5	Yellow	Alert	Internal	Attack Probable	Passive	Internal	Crewed and Ready
6	Red	Battle	Internal	Attack in Progress	Active	Internal	Crewed and Firing.
7	Maroon	Stalking	Internal	Attack Possible	Passive	Internal	Crewed.

PASSIVE SPACE SENSORS

	Space Sensors	S=	TL	Mod	C+S
C	Communicator				
E	EMS				
G	Grav Sensor				
H	HoloVisor				
N	N-Detector				
Q	Stealth Mask				
R	Radar				
S	Scanner				
T	Scope				
V	Visor				
W	CommPlus				

ACTIVE SPACE SENSORS

	Space Sensors	S=	TL	Mod	C+S
C	Communicator				
E	EMS				
J	Jammer				
R	Radar				
S	Scanner				
W	CommPlus				

PASSIVE WORLD SENSORS

		R=	TL	Mod	C+S
A	Activity Sensor				
C	Communicator				
D	Densitometer				
F	Field Sensor				
K	Analyzer/Sniffer				
L	Life Detector				
M	Mass Detector				
P	Proximeter				
W	CommPlus				
Y	Sound Sensors				

ACTIVE WORLD SENSORS

		R=	TL	Mod	C+S
B	Deep Radar				
C	Communicator				
W	CommPlus				

USING SENSORS

Alert. When there is something of possible interest, the Referee conveys to the players an Alert:

"Your [sensor] sees something about here [location].

Detection. Using the Sensor Task, the characters try to resolve what gave the alert (or they can ignore it). Success in the Sensor Task provides information about the alert.

Tracking. Once a sensor detects an object, it can track that object until some event causes the signal to be lost (it moves out of range; it is hidden by a world; it deliberately jams or hides its signal).

THE SENSOR TASK

		TL	Char	Skill	Mod
nD	**<**	**T**	**+C**	**+S**	**+M**
n = Range			Use: C4 C5	Use: Sensor	Active=+3 Benchmark Mount
Uncertain (1D)					

Active Sensors Maximum Range = S=7.

The Sensor Task determines the success of the effort.

Because the possible readings are unknown, the Referee administers the task in increments based on the dice used:

The Uncertain Die. The referee rolls the Uncertain Die secretly and notes its result. Players can assume the result is 3 (although it may be between 1 and 6). If this assumed 3 is less than T+C+S+M, he reveals anything detected at S=1 (for Space Sensors) or R=1 for (World Sensors).

The Second Die. The referee rolls the second Die and if the total is less than T+C+S+M, he reveals anything detected at S=1 (for Space Sensors) or R=1 for (World Sensors).

Additional Dice. This process allows checking at each available range without revealing to the players which ranges are important.

The Space Combat Round

AN OVERVIEW

Space Combat is resolved in Space Combat Rounds.

Each Round moves through five Phases of activity. This sequence repeats with each new Combat Round.

Combat Round = about 20 Minutes

Ship and small craft engage in combat. Some seem like seconds; some seem like hours. Some pass without anything happening; others are flurries of activity.

At the end of combat, count the number of Rounds and equate them generally to twenty-minute segments: (a ten Round fight probably took about 200 minutes or a little over three hours).

S M A R T

Situation - Launch - Attacks - Range Change- Target Effects

THE FIVE COMBAT ROUND PHASES

S	**SITUATION**	Attacker notes current Situation: detected Targets, Ranges, and available weapons.	Sensor Operations. New Contacts. Ship May Jump (Depart or Arrive). Boarders Breach Hull. Internal Defenses against Boarders.
M	**MISSILES**	Attacker launches Missiles.	Missiles Launched. AM Mode Defenses Fire. Resolve Missiles Scheduled to Impact This Round. Missiles Impact Armor.
A	**ATTACK**	Attacker fires non-missile weapons.	Resolve Weapons Attacks (including RINT). AB Mode Defenses. Absolute Mode Defenses. Attacks Impact Armor.
R	**RANGE CHANGE**	Ships may change Range.	Ship May Move Between Range Groups and Range Bands Ship Changes Thrust Ramming. Boarding Craft Contact Hull. Small Craft Dock. Deployables Return. Small Craft Launch. Deployables Launch. Pods Launch.
T	**TARGET EFFECTS**	Damage is determined for any successful attacks.	Determine Aimed and Actual Hit Location. Inflict Damage. Immediate Action Damage Control. Damage Severity = Hits / 2. Diagnosis Severity. Damage Control Operations

AM Mode. Anti-Missile Mode weapons (several types) defending against Missiles.
AB Mode. Anti-Beam Mode weapons (typically Sandcasters) defending against Beams.
Absolute Mode. Specific Defenses defending against very specific attacks (Meson Screen versus Meson Gun).

How Attacks Work

AN OVERVIEW

Each weapon fired against a target resolves the Space Weapon Task; then runs the Gauntlet of applicable defenses, and ultimately penetrates Armor. Failure at any step stops the attack. A successful attack then resolves damage.

STATUS

DEFENSE
AB AM MODES

Attacker		Defender
1D	<	Mount
	<	1 = T1
	<	2 = T2 B1
	<	3 = T3
	<	4 = T4 B2
	<	5 = Bay
	<	6 = LBay
	<	7= Main
AFJKLPW	<	S
MNQRV	<	BFGJKL

Defender is a Weapon Mount. Defender rolls equal or less on 1D to stop the attack.

SPACE RANGES

	S=		R=
B	**B**	Vlong 1000 m	**5**
Fighter	**1**	Distant 5 km	**6**
	2	Vdistant 50 km	**7**
Short	**3**	Orbit 500 km	**8**
	4	Far Orbit 5000 km	**9**
	5	Geo 50,000 km	**10**
Attack	**6**	1 ls	**11**
	7	2 ls	**12**
Long	**8**	8 ls	**13**
	9	16 ls	**14**
Deep Space	**10**	3 lm	**15**
	11	8 lm	**16**
	12	30 lm	**17**

THE SPACE WEAPON TASK

		TL	Char	Skill	Mod
nD	**<**	**T**	**+C**	**+S**	**+M**
n = Range (S= or R=)			Use: C4 C5	Use: Wpn	+TSM +Mount - Agility

THE GAUNTLET

	Space Weapons	AB Mode	AM Mode	Absolute Mode	Armor	
A	Particle Accelerator	■			■	
B	Slug Thrower		■		■	
C	CommCaster					
D	DataCaster					
E	Stasis					
F	Fusion Gun	■			■	
G	Meson Gun			■		
H	Inducer					
J	Mining Laser	■			■	
K	Beam Laser	■			■	
L	Pulse Laser	■			■	
M	Missile		■		■	
	Missile-5N		■	■	■	
N	KK Missile		■		■	
P	Plasma Gun	■			■	
Q	Ortillery				■	
R	Rail Gun				■	
S	SandCaster					
T	Jump Damper					
U	Tractor/Pressor					
V	Salvo Rack		■		■	
W	Disruptor	■			■	
X	Hybrid K-S-M	■	■		■	
Y	Hybrid L-S-M	■	■		■	
Z						
	Fighters		■			
	Small Craft		■			
	Ships	■	■	■	■	
	Boarders		■		■	
	Massive Explosion				■	
	Missile-N			■	■	
	Blast				■	
	Flash				■	
	Rad			■	■	
	EMP				■	
	Bang				■	

MODS

Mount= Mount Mod
Agility= PPlant Potential minus current Gs.

DEFENSE
ABSOLUTE MODE

T+C+S+M Attacker	<	T+C+S+M Defender
G	<	G
M-5N	<	N
Magnetics E	<	Q
Anti-Matter	<	R
all	<	T
all	<	U
Gravitics HTU	<	W

Attack fails of Attacker TCSM is equal or less than Defender TCSM.

ARMOR

Attacker 1D x Hits	<	Defender Armor
	<	Armor
	<	Ceram
	<	Organic
	<	Dense
	<	Polymer
	<	Charged
	<	SDense
	<	Kinetic
	<	LiteMetal
	<	VliteMetal
	<	HullMetal
	<	Geneered
	<	Hydrogen
	<	Strange
	<	Composite
	<	Crystaliron

SPECIAL SITUATIONS

Jammer.
Near Miss
Sitting Duck Mode
Special Destruction
Rad vs Organic

How Damage Works

AN OVERVIEW

A successful attack may inflict damage on the target ship.

Hit Location=

Flux (roll once for the Weapon).

Missile Target Mods=

Center of Mass= Min + Max Entry on HLT.
Center of Heat= Drives
Centr of Emissions= Sensors

Weapon Hits=

Number of Dice to be rolled
(determined by Weapon Mount).

Damage=

Hit Dice roll minus Armor
Zero or less is No Effect

Final Damage=

Damage divided by 2 (round down)
Read on the Damage Severity Table

Immediate Action=

Possible Severity Reduction

Diagnosis=

Difficulty of Diagnosing the Damage
Determine after the Battle

CHECKLIST

1. Flux for Hit Location.\
   Note Mods for Targetting.
2. Note Number of Weapon Hits.
3. Roll Dice for Damage Points.
4. Subtract Armor and divide by 2.
5. Consult Damage Severity Table

A. If the Hit Location has components, roll to apply the Damage to one of the components.

B. Roll for Immediate Action.

7. After the Battle, determine Diagnosis Severity for each Damaged Component.

A Component can have multiple Damages: (for example, a Difficult, two Averages, and a Staggering). They do not add.

Deployed or Extended Objects

Extended Objects (usually for Sensors) are noted on the Hit Location Table at Locations +6 or -6.

Deployed Turrets or Barbettes (usually for Weapons) may be placed in any empty Location on the Hit Location Table (usually +9 or -9).

A **Cluster or Braced Cluster** configuration ship is designed with non-standard Hit Locations.

ARMOR LAYERS

1	
2	
3	
4	
5	
6	

HIT LOCATIONS

-9	
-8	
-7	
-6	
-5	Comms
-4	Cargo
-3	Sensors
-2	Defenses
-1	Life Support
0	Hull
+1	Power
+2	Drives
+3	Weapons
+4	Bridge
+5	Computer
+6	
+7	
+8	
+9	

DAMAGE SEVERITY

H/2	Repair Difficulty	
1	Easy 1D	
2	Average 2D	
3	Difficult 3D	
4	Formidable 4D	
5	Staggering 5D	
6	Hopeless 6D	
7	Impossible 7D	
8	Beyond 8 D	
9	Destroyed	

Severity = Final Damage Applied = Hits/2.

Severity is the difficulty of repair task for this component.

IMMEDIATE ACTION DAMAGE CONTROL

Check Skill (2D)
Select and use any skill appropriate to the component.
Success converts the damage to Severity= Easy 1D and the component remains operable.
Automatic Failure on 12.

Not Possible for Damage above 6D.

Damage Severity is the difficulty of repair task for this component.

DIAGNOSIS SEVERITY

1D	Difficulty
1	Easy 1D
2	Average 2D
3	Difficult 3D
4	Formidable 4D
5	Staggering 5D
6	Hopeless 6D

Diagnosis Severity is the difficulty of diagnosing Damage Severity.

Defer rolling Diagnosis Severity until a repair attempt is contemplated.

How Movement Works

AN OVERVIEW

Ships can change Range Bands in the course of combat. Minor changes for advantage tale place at the end of the Combat Round. Major changes are more difficult.

They can change from one Band to an adjacent Range Band during the Movement Phase of a Combat Round, subject to limitations.

Space Ranges are divided into Groups and into Space Range Bands.

Bands B-1-2-3-4-5

A ship may change one Range Band per Round between Space Bands B-1-2-3-4-5.

SR to AR =

(10 – G) x 3 Rounds

AR to LR =

(14 – G) x 3 Rounds

LR to DS =

G Rounds

Deep Space

A ship in Deep Space cannot change Range Bands during the course of the battle.

G= Current Acceleration in G's

Agility = Power Plant Potential minus Current used Gs.

SPACE RANGES

	S=		R=
B	**B**	Vlong 1000 m	**5**
Fighter	**1**	Distant 5 km	**6**
	2	Vdistant 50 km	**7**
Short	**3**	Orbit 500 km	**8**
	4	Far Orbit 5000 km	**9**
	5	Geo 50,000 km	**10**
Attack	**6**	1 ls	**11**
	7	2 ls	**12**
Long	**8**	8 ls	**13**
	9	16 ls	**14**
Deep Space	**10**	3 lm	**15**
	11	8 lm	**16**
	12	30 lm	**17**

Range is the Range from the Attacker to the Target.

Range may be different for each ship pair.

MINOR RANGE CHANGES

A ship at a Range within a Group can change to an adjacent Range band within that Group at the end of the Combat Round.

Jump

A ship can escape a battle by Jumping (assuming it has Fuel and is beyond the 100 D Limit).

The Nuances of Combat

AN OVERVIEW

There are many exceptions and special situations in Combat.

Attackers alternate in resolving weapons fire during a Round.

Missile Launches. Missiles must physically travel from the Attacker to the Target. Launches at greater than S=2 are resolved in the next Round.

Pre-Battle Missile Launches. Missile attacks from S=6 or greater must be specified before the Battle begins; the Missile attack arrives in Round = Launch Range.

Delayed Missile Attacks. A Missile attack (except KKM) may be launched with an impact delay (specified by the Attacker) of 1 to 6 Rounds.

Lurking Missiles. Missiles can be launched to Lurk in a Range Band, and they attack when a Target moves to S=2 or less.

Targetting

Standard Targetting uses the Hit Location table with Flux.

Missiles may use Targetting applied to the Hit Location Table.

Heat= The hottest location on the ship is the Drives. Use Mod= Drives.

Emissions= Use Mod= Sensors (if Active) or Comms (if Active). Otherwise, Mod=0.

Firing Weapons= Use Mod= Weapons. If successful, it attacks the last weapon fired.

Center Of Mass= Use Minimum plus Maximum occupied locations on the HLT.

AM Anti-Missile Mode. Any number of AM Mode Weapons may fire against incoming Missile Attacks, but each AM Mode weapon may fire only once in a Round.

An AM Mode weapon may not Attack.

Designation as AM Mode continues until changed.

AB Anti Beam Mode. Any number of AB Mode Weapons may fire against incoming Beam Attacks, but each AB Mode weapon may fire only once in a Round.

An AB Mode weapon may not attack.

Designation as AB Mode continues until changed.

Battery Fire

Weapons of the same type (different other values are allowed) can fire together as a Battery.

One Weapon is the Lead Weapon; if it hits, the other weapons hit. Total Hits is determined by Mounts.

Multi-Ship Battery Fire. Multiple ships with CommCasters can create a Multi-Ship Battery.

Slave Craft. Uncrewed Small Craft can be slaved to a Ship with a DataCaster.

Boarding. A craft with people can attempt to Board if at S=B.

Deployable Turrets are slaved to a parent ship through its DataCaster.

Extendable Sensors can be pushed out from a ship to Hit Locations +6 to +9 or -6 to -9.

DataCaster

A DataCaster which successfully attacks a target may inflict:

Overload. A successful DataCaster attack with Hit Location= Sensor or Comm inflicts Damage on the Sensor or Comm.

Virus Insertion. A successful attack with Hit Location other than Sensor or Comm introduces an Applet into the ship's network (1D= 1 = Virus; otherwise Applet).

A Virus attacks each connected Computer at the rate of one new computer per Turn.

An Applet is annoying but has no long-term effect.

Disruptors

Disruptors boil away armor. Disruptor hits do not penetrate Armor; they directly destroy it. One Disruptor Hit (no dice are rolled) destroys one point of Armor.

Disruptors disregard Hit Location; their effect applies to the overall Armor of the ship (and to all Protections).

When all Armor for a ship is destroyed, the ship is open to vacuum.

COLLISIONS

A collision inflicts Damage equal to:

D= Tons * Speed^2

Tons= Volume Tons of the **other** vehicle.

Speed. If the crash is head-on, use the sum of the two speeds. If the two vehicles are at angles to each other, use the greater speed. If the two vehicles are travelling in the same direction, use the difference between the two speeds.

Useful Tonnage Calculation. To convert Sophont Size (Human= 100) to tons (displacement Tons = 13.5 cubic meters), divide by 20,000.

For Successful Attacks:

If Hit Location is Defenses and a Defense was used against the attack, that Defense is the Hit Sublocation.

If Hit Location is Hull, Armor is reduced one layer.

If Final Damage is 9 or Greater (Destroyed), attack again with Half Hits at a newly rolled Hit Location.

Black and White Globes

An attack against a Black Globe (it operates in Absolute Mode) which fails imposes no effects. An attack which succeeds inflicts hits against the Black Globe.

The same applies to White Globes. However, successful DataCaster attacks proceed to inflict Virus and Applets.

Comments

A Weapon cannot be built with a Range beyond its Maximum on the Weapon Attacks Chart.

If a Jump Inducer destroys a Hit Location (or sublocation) then the adjacent Locations are also destroyed.

A Jump Inducer requires a Jump Drive in the ship.

A Jump Damper requires a Jump Drive in the ship.

A Destroyed Hull (Damage Severity = 9D +) destroys the ship.

Treat each Weapon in the Hybrid T3 as a T1.

A Massive Explosion (in addition to other effects) destroys one layer of Armor.

Beam Weapons shed 1D of Damage for each Range Band in Atmosphere.

ARMAGEDDON

In this hypothetical battle (or series of attacks) involving dozens of ships and almost every technology available, we can see how the various weapons and defenses work. Examples are shown alphabetically by Weapon Code.

For example purposes, some weapons and some defenses are simplified to the basic model; others include stage and other information.

We assume that weapons operators (and defense operators, if any) are Char=7 Skill=3.

We ignore Agility (which is a Mod in the T+C+S+M formula). Agility = Maximum Power Plant Potential minus current Maneuver Drive Gs.

Checklist

1. Required Values (for Attacking and Defending Weapons)
   A. T= Tech Level of Attacking Weapon
   B. C+S = Characteristic + Skill of Weapon Operator.
   C. M = Mod.
      Weapon Mount Mod (from Space Weapon Mounts)
      Agility.
   D. Mount.
2. Roll T+C+S+M to potentially HIT. Failure ends attack.
3. Defenses
   A. AB Mode. Check AB Mode Table (based on Mount).
   B. AM Mode. Check AM Mode Table (based on Mount).
   C. Absolute Mode. Compare T+C+S+M.
   D. Failure ends attack.
4. Armor Penetration

   A1. Non-Missiles. Determine Hits (based on Mount Size) and roll that number of Dice.

   A2. Missiles. Determine Hits (based on Missile Types and Effects Chart).

   B. Subtract Armor.
   C. Divide by 2 = Final Damage.
5. Hit Location.
   A. Determine Mods based on Targetting.
   B. Roll on Hit Location Table.
   C. If the Location has subcomponents, randomly determine which one takes damage.
   D. Apply Final Damage as a Damage Severity.
   E. Check Immediate Action.

6. Additional Damage.

   A. If the Hit Location (or sublocation) was Destroyed, attack a second location.

   B. Use Hits from 4A and divide by 2. Subtract Armor. Divide by 2.

   C. Reconsult Step 5.

Special Cases

DataCaster. Each Hit (Die) with a result of 1 becomes an inserted Virus in a Sensor on the Target.

CommCaster. Allows multiple ships to participate in Battery Fire.

A PARTICLE ACCELERATOR

Range	S=5
Attacker	A-11 AR B1 Particle Accelerator-11
Defender	X-9 Vd T3 Hybrid KSM -9
Armor	Armor-5

Attack and Defense. The A-11 attacks with Dice = S= Space Range and must roll T+C+S+M or less (the Space Weapon Task HAW). Its B1 Barbette provides no Mod, so Assets = 11 + 7 + 3 = 21.

It rolls 5D (= 25) and misses.

It rolls 5D again the next turn (=20) which is less than 21 and (potentially) hits.

The target has allocated its Sandcaster in Anti-Beam AB Mode. The Defense AB AM Modes Table shows that S can defend against AFJKLPW, so S (contained in the hybrid KSM) can defend against A. The single Sandcaster in the X-9 is treated as T1. The defender must roll 1 or less with 1D to stop the attack. He rolls 3 and fails.

Armor Penetration. The A-11 attacks the ship's Armor-5. Hits are determined by the Weapon Mount (Barbette B1 = 3 hits). The attacker rolls 3D = 10 = Damage=10. The first 5 Damage are absorbed by the Armor-5. The ship receives Damage=5.

Hit Location and Damage. Hit Location = Flux = +4 – 4 = 0. The Damage impacts the Hull.

Final Damage = Damage/2 (round down) = 2. The Damage Severity Table shows the difficulty of repairing the hit is Average 2D.

The ship has a Damage Control person (Skill=3); Check Skill = roll 2D for 3 or less; he rolls 5 and fails to fix the damage.

Result. The target receives Average 2D Hull Damage.

A PARTICLE ACCELERATOR

Range	R=8
Attacker	A-11 AR B1 Particle Accelerator-11
Defender	X-9 Vd T3 Hybrid KSM -9
Armor	Armor-5

The Defender is a ship on the world surface; the Attacker is in Orbit R=8. A Particle Accelerator in Atmosphere uses World Ranges (as opposed to Space Ranges in Space).

Attack and Defense. The A-11 attacks with Dice = R= Range and must roll T+C+S+M or less. Its B1 Barbette provides no Mod, so Assets = 11 + 7 + 3 = 21.

It rolls 8D (= 20) and potentially hits.

Sandcasters are ineffective in atmosphere, so the Target has no Anti-Beam defense.

Armor Penetration. The A-11 attacks the ship's Armor-5. Hits are determined by the Weapon Mount (Barbette B1 = 3 hits).

Particle Accelerators in Atmosphere shed 1D per World Range (at R=8, it loses 8D hits) before hitting the target.

The attacker would roll 3D – 8D = less than 1D. The attack has no effect.

A PARTICLE ACCELERATOR

Range	R=8
Attacker	A-11 AR LBay Particle Accelerator-11
Defender	X-9 Vd T3 Hybrid KSM -9
Armor	Armor-5

The Defender is a ship on the world surface; the Attacker is in Orbit R=8. A Particle Accelerator in Atmosphere uses World Ranges (as opposed to Space Ranges in Space).

Attack and Defense. The A-11 attacks with Dice = R= Range and must roll T+C+S+M or less. Its LBay provides Mod+8, so Assets = 11 + 7 + 8 = 26.

It rolls 8D (= 24) and potentially hits.

Sandcasters are ineffective in atmosphere, so the Target has no Anti-Beam defense.

Armor Penetration. The A-11 attacks the ship's Armor-5. Hits are determined by the Weapon Mount (LBay = 20 hits).

Particle Accelerators in Atmosphere shed 1D per World Range (at R=8, it loses 8D hits) before hitting the target.

The attacker would roll 20D – 8D = 13D = Damage= 42. The first 5 Damage are absorbed by the Armor-5. The ship receives Damage=37.

Hit Location and Damage. Hit Location = Flux = +4 – 4 = 0. The Damage impacts the Hull.

Final Damage = Damage/2 (round down) = Final Damage=18. This value is more than 9; the Hull is destroyed.

Result. The target is destroyed.

B SLUG THROWER

Range	R=5
Attacker	B-10 Imp Vd T4 Slug Thrower-10 Slug-2S-UG
Defender	
Armor	Polymer-5

Attack and Defense. The B-9 attacks with Dice = R= Range and must roll T+C+S+M or less. The Quad Turret provides no additional Mod, so Assets = 10 + 7+3 = 20.

It rolls 5D (=14) and (potentially) hits.

Although Slugs are technically Missiles, there is no AM Anti-Missile defense against Slugs (they are too small). (A target with T Black Globe or U White Globe would have a defense against Slugs).

The potential hit for a SlugThrower is determined by the weapon mount T+C+S+M. The actual effect against armor is determined by the Slugs.

Armor Penetration. The Size-2 Slug Warhead Missile attacks the armor with 1D; he rolls 6. The first 5 Damage are absorbed by the Polymer-5. The ship receives Damage= 1.

Hit Location and Damage. Hit Location Chart: Flux = +5 - 4 = +1. The Damage impacts the Power systems.

Final Damage = Damage / 2 (round down) = 0. The hit is little more than a scratch.

Result. The attack hit but inflicted no Damage.

D DATACASTER

Range	R=7
Attacker	D-12 Adv T3 DataCaster-12
Defender	J-8 Jammer-8
Armor	

The DataCaster is a special case.

-

Infection Mode

The Datacaster inserts a Virus which corrupts the internal software.

Attack and Defense. The D-12 attacks with Dice = R= Range and must roll T+C+S+M or less. The Triple Turret T3 provides Mod -1, so Assets = 12 + 7+3 -1 = 21.

BUT, the target has its J-8 Jammer-8 active. It applies a Mod (equal to Jammer T+C+S+M – Space Range = 8+7+3+0 – 2 = 16).

The revised Attacker T+C+S+M = 12 +7 +3 -1 – 16 = 5. He must roll 5 or less on 7D, which is not possible. The attack fails.

Some time later, the Defender's Jammer-8 is not operational. The Attacker tries again.

Attack and Defense. The D-12 attacks with Dice = R= Range and must roll T+C+S+M or less. The Triple Turret T3 provides Mod -1, so Assets = 12 + 7+3 -1 = 21. He rolls 7D = 19 and the attack proceeds.

Armor Penetration. The DataCaster ignores Armor. It proceeds to attack the Target. The Triple Turret T3 produces 3 Hits (this is one attack; three hits are inflicted on one location).

Hit Location and Damage. Hit Location = Flux = +4 – 2 = Drives. One drive is selected = Jump Drive. The DataCaster rolls 1D for each Hit = 1, 2, 3. One Virus and two Applets are inserted.

The Virus disables the Jump Drive. The two Applets drop out unable to do any additional damage.

In the Next Turn, the Virus will attack an adjacent Hit Location.

Confusion (Anti-Missile) Mode

The Datacaster confuses the missile and it detonates prematurely. The effect is (as in all AM Defenses) based on Mount.

D DATACASTER

Range	R=7
Attacker	D-12 Adv Main DataCaster-12
Defender	
Armor	

If this DataCaster successfully attacks, it inflicts 30 hits: probably 5 Virus and 25 Applets on a single Hit Location.

E STASIS PROJECTOR

Range	R=7
Attacker	E-19 Vd T1 Stasis-19
Defender	Q-14 Internal Mag Scrambler
Armor	Hullmetal-11

Attack and Defense. The E-19 attacks with Dice = R= Range and must roll T+C+S+M or less. Its Single Turret T1 has Mod -3, so Assets = 19 + 7 + 3 -3 = 26.

It rolls 7D (= 20) and (potentially) hits.

The target has allocated its Q-14 Mag Scrambler in Absolute Mode: the Q-14 Internal Mount provides Mod +1, so its Assets are T+C+S+M= 14+7+3 +1 = 25. The defense is less than the Attacker's 26 and the attack continues.

Armor Penetration. The E-19 now attacks the ship's Hullmetal-11. Actually, Stasis ignores Armor, so the Hullmetal-11 is ineffective.

Hits are determined by the Weapon Mount (Turret T1 = 1 hits). The attacker rolls 1D = 6 Damage. The ship receives Damage=6.

Hit Location and Damage. Hit Location = Flux = +6 – 4 = +2. The Damage impacts the Drives.

Final Damage = Damage/2 (round down) = 3. The Damage Severity Table shows the difficulty of repairing the hit is Formidable 3D.

The Drives compartment includes J-Drive and M-Drive. The damage is randomly allocated (1-2-3 = Jump; 4-5-6 = Maneuver) = 4 = Maneuver.

The ship has a Damage Control person (Skill=3); Check Skill = roll 2D for 3 or less; he rolls 5 and fails to fix the damage.

Result. The target receives Formidable 3D Maneuver Drive Damage.

F FUSION GUN

Range	S=2 = R=7
Attacker	F-15 Adv G B2 Fusion Gun-15
Defender	S-14 Adv G B2 Sandcaster-14
Armor	Hullmetal-11

Attack and Defense. The F-15 attacks with Dice = R = Range and must roll T+C+S+M or less. Its Dual Barbette B2 has Mod +2, so Assets = 15+7+3+2 = 27. It rolls 7D (=22) and (potentially) hits.

The target has allocated its S-14 Advanced Geo Range Dual Barbette Sandcaster-14 in Anti-Beam mode. Dual Barbette in AB Mode must roll 4 or less to stop the attack. The defender must roll 4 or less with 1D to stop the attack. He rolls 5 and the attack continues.

In the next Turn, the F-15 tries again. It rolls 7D (=32) and fails.

In the next turn, the F-15 tries a third time. It rolls 7D (=22) and potentially hits. The target again defends with its S-14, rolls 5 and this time fails to stop the attack.

Armor Penetration. The F-15 now attacks the ship's Hullmetal-11. Hits are determined by the Weapon Mount (Dual Barbette B2 = 5 Hits). The attacker rolls 5D = 17 Damage. The Hullmetal absorbs the first 11 Damage, so the ship receives Damage=6.

Hit Location and Damage. Hit Location = Flux = +3 – 5 = -2. The Damage impacts the Defenses.

Final Damage = Damage/2 (round down) = 6/2 = 3. The Damage Severity Table shows the difficulty of repairing the hit is Difficult 3D. Because a specific Defense was involved in the attack, it is the one receiving the Final Damage. The S-14 operator tries Immediate Action Damage Control (Skill=3); Check Skill = roll 2D for 3 or less; he rolls 6 and fails to fix the damage.

Result. The S-14 is out of action with Difficult 3D Damage.

G MESON GUN

Range	S=11
Attacker	G-16 Imp DS Main Meson Gun-16
Defender	G-11 Internal Meson Screen-11
Armor	Hullmetal-11

Attack and Defense. The G-16 attacks with Dice = S= Space Range and must roll T+C+S+M or less. Its Main Mount has Mod +10, so Assets = 16 + 7 + 3 + 10 = 36. It rolls 11D (=40) and misses.

It shoots again, rolls 11D (=34) and potentially hits.

Firing from S=11, the attack is marked RINT Resolve In Next Turn. Play proceeds for other activity in the current turn.

In the next turn, the target has allocated its G-11 Internal Meson Screen in Absolute Mode: the G-11 internal mount provides Mod +1, so its assets are T+C+S+M= 11+7+3+1 = 22. The attacker Assets = 36 overwhelm the defenses, and the attack proceeds.

Armor Penetration. The G-16 now attacks the Hullmetal-11. Hits are determined by Weapon Mount (Main= 30 Hits). The attacker rolls 30D = 74 Damage. The first 11 are absorbed by the Hullmetal-11, so the ship receives Damage= 64.

Hit Location and Damage. Hit Location = Flux = +6 – 1 = +5. The damage impacts the Computer.

Final Damage = Damage/2 (round down) = 32. This result is off the chart: the Computer is destroyed.

Additional Effects. When a Component is Destroyed, the attack repeats (at half effect) at another Hit Location.

Inflict half Damage=74 (= Damage 37) minus Hullmetal-11 = Damage=26.

Hit Location = Flux = +5 – 4= +1 = Power Systems. The Damage=26 impacts the Power Plant. The result is off the chart and the Power Plant is destroyed.

Because that target location is destroyed, the damage is halved again and applied to yet another random location.

H JUMP INDUCER

Range	R=6
Attacker	H-13 Exp Vl T1 Jump Inducer-13
Defender	
Armor	Hydrogen-13

Attack and Defense. The H-13 attacks with Dice = Range = R=6. Its Single Turret T1 has Mod - 3, so Assets = 13 + 7 + 3 -3 = 20. It rolls 6D (=19) and potentially hits.

Armor Penetration. There is no real defense against an H-13 (not even Armor). Hits are determined by the Weapon Mount (T1= 1 Hit). The attacker rolls 1D = 5, so the ship receives Damage=5.

Hit Location and Damage. Hit Location = +4 -1 = +3. The Damage impacts Weapons.

Final Damage = Damage/2 (round down) = 2. The Damage Severity Table shows the difficulty of repairing the hit is Average 2D. The target ship has six Weapons Mounts: assign each a number from 1 to 6 and roll 1D. The specific Weapon receives the Damage.

The weapon operator tries Immediate Action Damage Control (Skill=3); Check Skill = roll 2D for 3 or less; he rolls 6 and fails to fix the damage.

One Weapon Installation receives Average 2D Damage.

H JUMP INDUCER

Range	R=7
Attacker	H-21 Adv Or Main Jump Inducer-21
Defender	
Armor	Hydrogen-13

Attack and Defense. The H-21 attacks with Dice = Range = R=7. Its Main Mount has Mod +10, so Assets = 21 + 7 + 3 +10 = 41. It rolls 7D (=35) and potentially hits.

Armor Penetration. There is no real defense against an H-21 (not even Armor). Hits are determined by the Weapon Mount (Main= 30 Hits). The attacker rolls 30D = 89, so the ship receives Damage=89.

Hit Location and Damage. Hit Location = +4 -4 = 0. The Damage impacts Hull.

Final Damage = Damage/2 (round down) = 44. The Hydrogen-13 absorbs 13, and the remaining damage 31 reach the ship. The Hull is damaged beyond repair.

J K L LASERS

Range	S=4 = R= 9
Attacker	J-8 T1 Mining Laser
	K-9 T2 Pulse Laser
	L-15 Adv G T4 Laser-15
Defender	S-14 Adv G B2 Sandcaster-14
Armor	LiteMetal-9

This engagement begins at S=4 = R=9, the J-8 and the K-9 cannot fire.

Attack and Defense. The L-15 attacks with Dice = Range= R=9. Its Quad Turret T4 has Mod 0, so Assets = 15 + 7 + 3 = 25. It rolls 9D (= 20) and potentially hits.

The target has its S-14 Dual Barbette B2 in Anti-Beam AB Mode must roll 4 or less to stop the attack. The defender must roll 4 or less with 1D to stop the attack. He rolls 2 and the attack fails.

The Attacker can move one Space Range Band per round between B-1-2-3-4. He moves closer to S=3.

The L-15 attacks (again) with dice equal to Range (now S=3 = R= 8). He must roll 25 or less on 8D (=31) and he misses.

The Attacker can move one Space Range Band per round between B-1-2-3-4. He moves closer to S=2 = R =7. Now, all three weapons J-8 K-9 L-15 can fire.

The J-8 attacks with dice equal to Range (now R=7) and must roll T+C+S+M or less. The Single Turret T1 has Mod -3, so Assets = 8+7+3 – 3 = 15. He rolls 7D (=21) and misses.

The K-9 attacks. T+C+S+M = 9 + 7 + 3 -2 = 17. He rolls 7D = 21 and potentially hits.

The target has its S-14 Dual Barbette B2 in Anti-Beam AB Mode. The defender must roll 4 or less to stop the shot. He rolls 3 and the attack fails.

The L-15 attacks with dice equal to Space Range (S=2 = R=7) and must roll T+C+S+M or less. The Quad Turret T4 has Mod = 0, so Assets = 15 + 7 + 3 = 25. He rolls 7D (=21) and potentially hits.

The defending AB turret has already fired; it cannot fire again in the current turn.

Armor Penetration. The L-16 now attacks the Litemetal-9. Hits are determined by Weapon Mount (Quad Turret T4 =4). The attacker rolls 4D = 13 Damage. The first 9 are absorbed by the Litemetal-9, so the ship receives Damage= 4.

Hit Location and Damage. Hit Location = +5 – 6 = -1. The damage impacts Life Support. Final Damage = Damage/2 (round down) = 2. Life Support has received an Average 2D damage.

The Engineer (Skill=Engineer-3) sees the hit and tries Immediate Action. Check Skill (2D) and rolls 3. He manages to slap a patch on the problem. It is reduced to Easy 1D and will have to be repaired later, but at least it's still functioning.

M MISSILE

Range	S=2
Attacker	M-10 Improved LR T3 Missile-10
	launches Missile-5X-HW
	launches Missile-5X-OG
	launches Missile-5X-SA
	launches Missile-5X-DL
Defender	L-15 Adv G T4 Laser-15
Armor	two layers of Vlitemetal-10

This engagement is relatively close; the missiles impact in the turn they are launched. The launcher will fire one every turn.

Attack and Defense. The Missile-5X-HW attacks with Dice = Range = S=2 and must roll T+C+S+M or less. The Triple Turret T3 has Mod -1. The Missile is HW HardWired, so its C+S = 5 (it disregards the C+S of the Launcher Operator). Assets = 10 + 5 +-1 = 14. It rolls 2D (=11) and potentially hits.

Attack and Defense. The Missile-5X-OG attacks with Dice = Range = S=2 and must roll T+C+S+M or less. The Triple Turret T3 has Mod -1. Because the Missile is OG Operator Guided (which can be used at S=2 or less), C+S is taken from the Launcher Operator. Assets = 10 + 7 + 3 +-1 = 19. It rolls 2D (=11) and potentially hits.

Attack and Defense. The Missile-5X-SA attacks with Dice = Range = S=2 and must roll T+C+S+M or less. The Triple Turret T3 has Mod -1. The SA Self-Aware guidance system has its own C+S which is used instead of the Launcher Operator C+S. Assets = 10 + 7 + 3 +-1 = 19. It rolls 2D (=11) and potentially hits.

Attack and Defense. The Missile-5X-DL attacks with Dice = Range = S=2 and must roll T+C+S+M or less. The Triple Turret T3 has Mod -1. The DL DownLoad guidance system transfers the Operators C+S to the Missile Guidance system. Assets = 10 + 7 + 3 +-1 = 19. It rolls 2D (=11) and potentially hits.

The target has allocated its L-15 Adv G T4 Laser-15 in Anti-Missile AM Mode. The defender must roll 3 (on 1D) or stop the attack. He rolls 2. The attack fails.

The missile attacks the ship and its two layers of VliteMetal-10.

The Size-5 Explosive Warhead Missile attacks the armor with 5D; he rolls 16. The two layers of VliteMetal-10 absorb the Damage.

M MISSILE

Range	S=7
Attacker	M-10 Improved LR T3 Missile-10
	launches Missile-5X-HW
	launches Missile-5X-OG
	launches Missile-5E-SA
	launches Missile-5N-DL
Defender	L-15 Adv G T4 Laser-15
Armor	two layers of Vlitemetal-10

This ship is at Attack Range: far enough away that it can't just shoot missiles and expect them to hit right away.

The ship preplans its strategy: one shot every turn until the battle is over. The first shot will hit in Turn 7.

Jump ahead to Turn 7

Missile-5X-HW launches with Dice = Range = S=7 and must roll T+C+S+M or less. The Triple Turret T3 has Mod -1, Hard-Wired guidance provides C+S= 5, so Assets = 10+5 -1 = 14. It rolls 7D (= 13) and potentially hits. The target has allocated its L-15 Adv G T4 Laser-15 in Anti-Missile AM Mode. The attacker must roll 3 (on 1D) or less. He rolls 5. The attack fails.

Jump ahead to Turn 8

Someone made a planning mistake. Missile-5X-OG is Operator Guided; it cannot reach beyond S=2. Someone will be reprimanded after the battle.

Jump Ahead to Turn 9

The Missile-5X-SA launches with Dice = Range = S=7 and must roll T+C+S+M or less. The Triple Turret T3 has Mod -1, Self-Aware guidance provides C+S= 7+3, so Assets = 10+7+3 -1 = 19. It rolls 7D (= 18) and potentially hits.

The target's L-15 Adv G T4 Laser-15 is in Anti-Missile AM Mode. Defender must roll 3 (on 1D) or less. He rolls 5 and the attack continues.The missile attacks the ship and its two layers of VliteMetal-10. The Size-5 EMP Warhead Missile attacks armor with 5D = 22. Armor absorbs the first 20 points of Damage, so the ship receives Damage=2.

Hit Location and Damage. Hit Location = +5 – 6 = -1. The damage impacts Life Support. Final Damage = Damage/2 (round down) = 1. Life Support receives an Easy 1D damage.

Jump Ahead to Turn 10

Defender tries to stop the next missile: he rolls 5 and the attack continues. The missile attacks the ship and its two layers of VliteMetal-10. The Size-5 Nuke Warhead Missile impacts and creates a Massive Explosion: consult the Massive Explosion Table with Size + 1D = 5+ 3 = 8. The explosion inflicts a Vnear Miss with Blast=30 = 102 (2 layers of VliteMetal-10 absorb 20) Damage = 82. Final Damage = 41, which is off the chart: whatever it hits will be destroyed.

Hit Location and Damage. Consult the Hit Location Table: Flux = +1-3 = -2 = Defenses. The target has three defenses: assign each a number 1-2-3 and randomly determine which is Destroyed.

Additional Effects. When a Component is Destroyed, the attack repeats (at half effect) at another Hit Location.

Inflict half Damage=102 (= Damage 37) minus two layers of VliteMetal-10 = Damage=17.

Hit Location = Flux = +5 – 4= +1 = Power Systems. The Damage=17 impacts the Power Plant. The result is off the chart and the Power Plant is destroyed.

N KK MISSILE

Range	S=2, later S=7.
Attacker	N-14 Adv DS Bay KK Missile-14 Missile-6K-OG Missile-6K-HW
Defender	
Armor	3 layers of LiteMetal-13

Attack and Defense. The N-11 attacks with Dice = Space Range and must roll T+ C+S+M or less. Its Bay provides Mod +5, so Assets = 14 + 7 + 3 + 5 = 29. It rolls 2D (= 10) and potentially hits.

The target has deployed no defenses against the KKM.

The missile attacks the ship and its three layers of LiteMetal-10.

The Size-6 KKM hits with Speed ^2 = Space Range ^2 = 2^2 = 4. He rolls 4D = 16 which is absorbed by the Armor.

Later, the ship launches its KK Missile attack from S=7. It impacts in Turn +7.

The Attacker must roll T+C+S+M = 14+5+5 = 24 or less on 7D. He rolls 23 and potentially hits. There are no defenses, so the Missile directly attacks the ship.

The Size-6 KKM hits with Speed^2 = Space Range^2 = 7^2 = 49. He rolls 49 Dice = 150. The first 39 are absorbed by Armor, but the remaining 111 cause Damage = 111/2 = Final Damage=55.

Hit Location Chart and Damage. Hit Location = +4 – 1 = +3. The damage impacts Weapons. The target has five weapons installations: assign each a number and randomly determine which one = 2 = Laser Turret. The Laser Turret is destroyed.

Additional Effects. When a Component is Destroyed, the attack repeats (at half effect) at another Hit Location.

Inflict half of Damage=150 (= Damage 75) minus three layers of LiteMetal-13 = Damage=36 = Final Damage= 18.

Hit Location = Flux = +5 – 4= +1 = Power Systems. The Damage=18 impacts the Power Plant. The result is still off the chart and the Power Plant is destroyed.

P PLASMA GUN

Range	R=2
Attacker	P-5 Exp Vl B1 Plasma Gun-5
Defender	S-9 T1 Sandcaster-5
Armor	Armor-5

Attack and Defense. The P-5 attacks with Dice = R = Range and must roll T+C+S+M or less. Its Barbette B1 has no Mod, so Assets = 5+7+3= 15. It rolls 2D (=10) and (potentially) hits.

The target has allocated its S-14 Advanced Geo Range Dual Barbette Sandcaster-14 in Anti-Beam mode. Dual Barbette in AB Mode must roll 4 or less to stop the attack. The defender must roll 4 or less with 1D to stop the attack. He rolls 5 and the attack continues.

In the next Turn, the P-5 tries again. It rolls 2D (=11) potentially hits. The target again defends with its S-14, rolls 5 and this time fails to stop the attack.

Armor Penetration. The P-5 now attacks the ship's Armor-5. Hits are determined by the Weapon Mount (Barbette B1 = 3 Hits). The attacker rolls 3D = 14 Damage. The Armor-5 absorbs the first 5 Damage, so the ship receives Damage=9.

Hit Location and Damage. Hit Location = Flux = +3 – 5 = -2. The Damage impacts the Defenses.

Final Damage = Damage/2 (round down) = 9/2 = 4. The Damage Severity Table shows the difficulty of repairing the hit is Formidable 4D. Because a specific Defense was involved in the attack, it is the one receiving the Final Damage. The S-14 operator tries Immediate Action Damage Control (Skill=3); Check Skill = roll 2D for 3 or less; he rolls 6 and fails to fix the damage.

Result. The S-14 is out of action with Difficult 3D Damage.

QORTILLERY

Range	R=9
Attacker	Q-15 Geo LBay Ortillery -15
Defender	L-10 Vd LBay Beam Laser-10
Armor	

The standard production Ortillery is designed for R=7, which is impractical in space combat; useful systems require R= 8 Orbit, R=9 Far Orbit, or R=10 Geosynchronous Orbit.

Attack and Defense. The Q-15 attacks with Dice = R= Range and must roll T+C+S+M or less. Its Large Bay LBay provides Mod +8, so Assets = 15+7+3 +8 = 33. It rolls 9D = 36 and misses.

The Q-15 attacks again in the next turn. It rolls 31 and potentially hits.

The surface target is defended by L-10 VDistant Range Large Bay Beam Lasers. It must roll 6 or less to stop the attack. The result is automatic; the attack fails.

The admiral rethinks his plans and tries again.

QORTILLERY

Range	R=9 = S=4
Attacker	Q-15 Geo LBay Ortillery -15 Missile-5D-HW
Attacker	M-8 T3 Missile-8 Missile-5X-HW
Defender	L-10 Vd LBay Beam Laser-10
Armor	

Attack and Defense. The Missile-5X-HW attacks with Dice = Range = S=4 and must roll T+C+S+M or less. The Triple Turret T3 has Mod -1. The Missile is HW HardWired, so its C+S = 5 (it disregards the C+S of the Launcher Operator). Assets = 10 + 5 +-1 = 14. It rolls 4D (=12) and potentially hits.

The surface target is defended by L-10 VDistant Range Large Bay Beam Lasers. It must roll 6 or less to stop the attack. The result is automatic; the attack fails.

Armor Penetration. The target is a Single Hex (= 1000 meters in diameter). There is no armor. The Deadfall Missile-5D-HW (the equivalent of a Size-5 Meteorite) creates a Massive Explosion.

Consult the Massive Explosion Table (Size – 1D = 5 -3 =) 2 = Hit. Blast= 40D (and other effects).

RRAIL GUN

Range	S=5
Attacker	R-13 LR Main Rail Gun-13 Missile-6X-HW
Defender	F-14 Adv Vd B2 Fusion Gun-14
Armor	Hullmetal-11

Attack and Defense. The R-13 attacks with Dice = Space Range and must roll T+ C+S+M or less. Its Main Mount provides Mod +10, so Assets = 13 + 5 + 10 = 28. It rolls 5D (= 24) and potentially hits. It will be resolved in the next turn.

In the next turn, the target has deployed its F-14 Adv Vd B2 Fusion Gun-14 in Anti-Missile AM Mode. The defender must roll 4 or less (on 1D) to stop the attack. He rolls 2. The attack fails.

The attacker tries again. It rolls 5D (=16) and potentially hits. The defender rolls in the AM Mode; he must roll 4 or less (on 1D) to stop the attack. He rolls 6. The attack continues.

The Missile attacks the ship and its Hullmetal-11.

The Size-6 Explosive Warhead Missile attacks the armor with 6D; he rolls 30. Hullmetal-11 absorbs 11 and Damage= 19 = Final Damage= 9.

Hit Location and Damage. Hit Location = +4 – 4 = 0. The damage impacts Hull, which is Destroyed. The ship comes apart.

Additional Effects. Normally, when a Component is Destroyed, the attack repeats (at half effect) at another Hit Location. In this case, the Hull is destroyed; its surviving components are scattered.

SSANDCASTER

Range	
Attacker	S-9 T1 Sandcaster-9
Defender	
Armor	

Sandcasters are created and installed as Weapons, but they operate only in the Anti-Beam AB defensive mode.

TJUMP DAMPER

Range	R=8
Attacker	T-15 Orbit B1 Jump Damper-15
Defender	
Armor	

The Jump Damper creates a 100D Field with a radius equal to R=Range.

Operations. The target is at R=8 and preparing to Jump. The attacker activates the T-15 which creates a Jump Damping field with R=9. Because the target is within the field; it cannot Jump.

U TRACTOR/ PRESSOR

Range	R=7
Attacker	U-15 T1 Tractor/Pressor-15
Defender	W-17 Internal Grav Scrambler-17
Armor	Hullmetal-11

Attack and Defense. The U-15 attacks with Dice = R = Range and must roll T+C+S+M or less. Its Single Turret T1 has Mod -3, so Assets = 15+7+3-3 = 22. It rolls 7D (=27) and misses.

In the next Turn, the U-15 fires again. It rolls 7D (=19) and potentially hits.

The target has allocated its W-17 Internal Grav Scrambler-17 in the Absolute Mode. Attacker T+C+S+M= 22 versus Defender T+C+S+M = 17+7+3+1 = 28. The attack is stopped.

Armor Penetration. The T-15 tries against a neighboring ship without a Grav Scrambler. After potentially hitting, it attacks the ship. Tractor/Pressor ignores Armor. The T1 Mount inflicts 1 Hit = 1D = 5. Damage =4.

Hit Location and Damage. Hit Location = Flux = +5 – 1 = +4. The Damage impacts the Bridge.

Final Damage = Damage/2 (round down) = 4/2 = 2. The Damage Severity Table shows the difficulty of repairing the hit is Average 2D. 4D. Because a specific Defense was The Bridge has several component Sensor Consoles: number each and randomly select one = Visor. The Visor receives Average 2D Damage.

One of the Bridge Crew tries Immediate Action Damage Control (Skill=3); Check Skill = roll 2D for 3 or less; he rolls 2 (he smacks the side of the Visor; its picture returns). It has an Easy 1D damage that will need to be repaired later.

V SALVO RACK

Range	S=2
Attacker	V-10 Bay Salvo Rack-10
	Missile-3X-OG
Defender	F-11 Ear Vd B2 Fusion Gun-11
Armor	3 layers Hullmetal-11

Attack and Defense. The V-10 attacks with Dice = Space Range and must roll T+ C+S+M or less. Its Bay Mount provides Mod +5, so Assets = 10 + 7+3 + 5 = 25. It rolls 2D (= 8) and potentially hits.

In the next turn, the target has deployed its F-11 Ear Vd B2 Fusion Gun-11 in Anti-Missile AM Mode. The defender must roll 4 or less (on 1D) to stop the attack. He rolls 6. The attack proceeds.

The Missile attacks the ship and its 3 layers of Hullmetal-11.

The Size-3 Explosive Warhead Missile attacks the armor with 3D; he rolls 14. The first layer of Hullmetal-11 absorbs 11 and the second layer of Hullmetal-11 absorbs the next 3. The ship is unaffected.

W DISRUPTOR

Range	R=7
Attacker	W-16 Early B2 Orbit Disruptor-16
Defender	S-9 T1 Sandcaster-9
	S-9 T1 Sandcaster-9
	S-9 T1 Sandcaster-9
Armor	Armor-6

Attack and Defense. The W-16 attacks with Dice = R = Range and must roll T+C+S+M or less. Its Dual Barbette B2 has no Mod, so Assets = 16+7+3 = 26. It rolls 7D (=22) and potentially hits.

The target has allocated three S-9 T1 Sandcaster-9 in the Anti-Beam AB. The defender must roll 1 or less to stop the attack: he rolls 2, 5, and 1. The attack fails.

The W-16 fires again in the next turn. It rolls 7D (=24) and potentially hits.

The target has allocated three S-9 T1 Sandcaster-9 in the Anti-Beam AB. The defender must roll 1 or less to stop the attack: he rolls 2, 3, and 4. The attack proceeds.

Armor Penetration. The W-16 now attacks the ship's Armor-5. Hits are determined by the Weapon Mount (Barbette B2 = 5D). Each D reduces armor by -1. 5D reduces ship from Armor-6 to Armor-1.

Hit Location and Damage. The Disruptor disregards Hit Location; it applies to the entire ship.

W DISRUPTOR

Range	R=7
Attacker	W-16 Early B2 Orbit Disruptor-16
Defender	T-16 Internal Black Globe-16
Armor	Armor-6

Attack and Defense. The W-16 attacks with Dice = R = Range and must roll T+C+S+M or less. Its Dual Barbette B2 has no Mod, so Assets = 16+7+3 = 26. It rolls 7D (=22) and potentially hits.

The target has a T-16 Black Globe deployed (operating) and defending in Absolute Mode. Compare Attacker T+C+S+M = 16 + 7+3 + 0 = 26 versus Defender T+C+S+M = 16+7+3 + 0 = 26. The Attack fails if less than Defender; the values are equal so the Attack succeeds.

Hit Location And Damage. Disruptors ignore Hit Location and Black Globes ignore Hit Location. The W-16 now inflicts Hits against the T-16. Hits are determined by the Weapon Mount (Barbette B2 = 5D = 21. The T-16 receives and stores 21 Hits. When this value exceeds Hull Tonnage times Jump Potential, the T-16 and the Jump Drive would be destroyed.

1 Battery Fire

Range	R=6
Attacker	Lead P-10 T3 Plasma Gun-10
	P-10 T2 Ear Plasma Gun-10
	P-10 Distant T2 Plasma Gun-10
	P-10 T1 Plasma Gun-10
Defender	S-9 T3 Sandcaster-5
Armor	Hullmetal-11

Battery Fire allows various weapons of the same Type to fire together with greater effect. One weapon is selected as the Lead Weapon; the other weapons add to its effect if it hits and inflicts damage.

Attack and Defense. The Attacker has four P-10 Plasma Gun turrets of various sizes. The Lead P-10 T3 Plasma Gun-10 attacks with Dice = R = Range and must roll T+C+S+M or less. Its Triple Turret T3 has Mod -1, so Assets = 10+7+3 -1 = 19. It rolls 6D (=17) and potentially hits.

The target has allocated its S-9 T3 Sandcaster-5 in Anti-Beam mode. Triple Turret T3 must roll 3 or less to stop the attack. It rolls 2 and the attack fails.

The Lead P-10 fires again in the next turn. This time, the S-9 fails to stop the attack.

Armor Penetration. The Lead P-10 now attacks the ship's Hullmetal-11. Because this is Battery Fire, the other Plasma Guns participate as well. The Hits are determined by the Weapon Mounts (T3 = 3 hits; T2 = 2 hits; T2 = 2 hits; T1 = 1 hit) = 8 Hits. The attacker rolls 8D = 28 Damage. The Hullmetal-11 absorbs the first 11; the ship receives Damage= 17.

Hit Location and Damage. Hit Location = Flux = +3 – 5 = -2. The Damage impacts the Defenses.

Final Damage = Damage/2 (round down) = 17/2 = 8. The Damage Severity Table shows the difficulty of repairing the hit is Beyond Impossible 8D. Because a specific Defense was involved in the attack, it is the one receiving the Final Damage. The S-9 operator tries Immediate Action Damage Control (Skill=3); Check Skill = roll 2D for 3 or less; he rolls 6 and fails to fix the damage.

Result. The S-9 is out of action with Beyond Impossible 8D Damage.

2 Battery Fire with CommCaster

Range	R=6
Attacker	Lead P-10 T3 Plasma Gun-10
	P-9 T2 Ear Plasma Gun-10
	P-9 Distant T2 Plasma Gun-10
	C-8 T1 CommCaster-8
	P-10 T1 Plasma Gun-10
	P-10 T1 Plasma Gun-10
	P-10 T1 Plasma Gun-10
	P-10 T1 Plasma Gun-10
	C-8 T1 CommCaster-8
Defender	J-8 Jammer-8
Armor	Hullmetal-11

Battery Fire with CommCaster

Each ship equipped with a Commcaster can contribute its weapons to Battery Fire.

Each CommCaster must be within Range of all participating ships.

Each CommCaster must successfully roll T+C+S+M for the R= Range to the farthest participating CommCaster. Ships in the same Range Band are at R=5.

The strongest Defender Jammer is a negative Mod on each T+C+S+M.

Attack and Defense. Two ships in the same Range Band work together through their CommCasters for Battery Fire against a target at R=6.

Attacker One has three P-10 Plasma Gun turrets of various sizes. Attacker Two has four P-10 Plasma Gun T1 turrets.

The ships first initiate CommCaster communications. Attacker One is at R=5 from Attacker Two. The Defender Jammer-8 produces a negative Mod = T+C+S+M – Space range = 8+7+3+0 –1 = -17.

Attacker One must roll 10+7+3 – 17 = 3 or less on 6D. This is harder than it looks.

At some time later, the Jammer-8 is not functioning.

Attacker One must roll 10+7+3+0 = 20 or less on 6D. He rolls 18 and his Commcaster is operational.

Attacker Two does the same.

Battery Fire begins with the Lead P-10. It hits and the other Plasma Guns chime in.

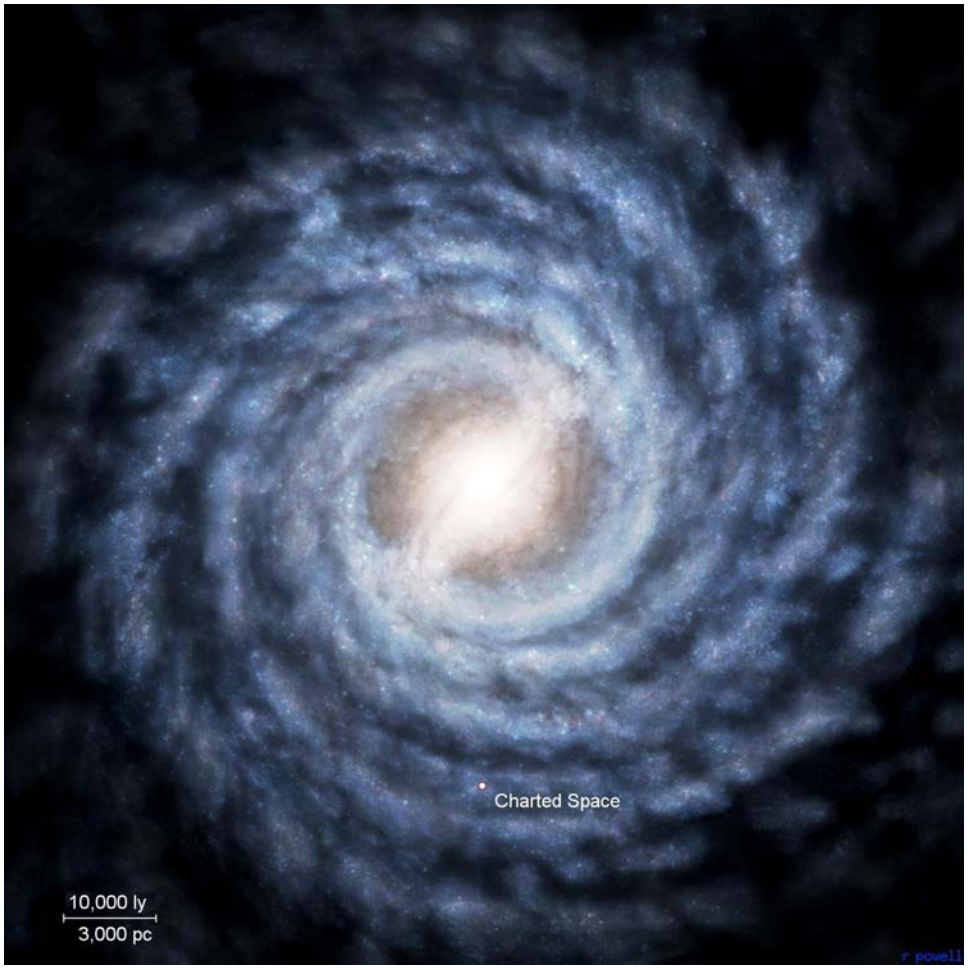
Armor Penetration. The Lead P-10 now attacks the ship's Hullmetal-11. Because this is Battery Fire, the other Plasma Guns participate as well. The Hits are determined by the Weapon = 11 Hits. The attacker rolls 11D = 38 Damage. The Hullmetal-11 absorbs the first 11; the ship receives Damage= 27.

Hit Location and Damage. Hit Location = Flux = +3 – 3 = 0. The Damage impacts the Hull.

Final Damage = Damage/2 (round down) = 27/2 = 12. This result is off the chart: the Hull is Destroyed. The target ship is blown to pieces.

The Galaxy

The Galaxy is that unique grouping of stars and worlds which is the home of Humaniti (as well as of many other sophonts).



The Galaxy is naturally divided into three distinct regions: the Core, the several Arms, and the Rifts between the Arms.

The Core. The Core of the Galaxy, approximately 3000 parsecs in radius, holds the majority of the galaxy's mass and stars.

The Core has two important characteristics:

It is dominated by high levels of radiation (including high constant levels, and even higher periodic levels). Habitable planets are rare and native life (intelligent or not) are even rarer.

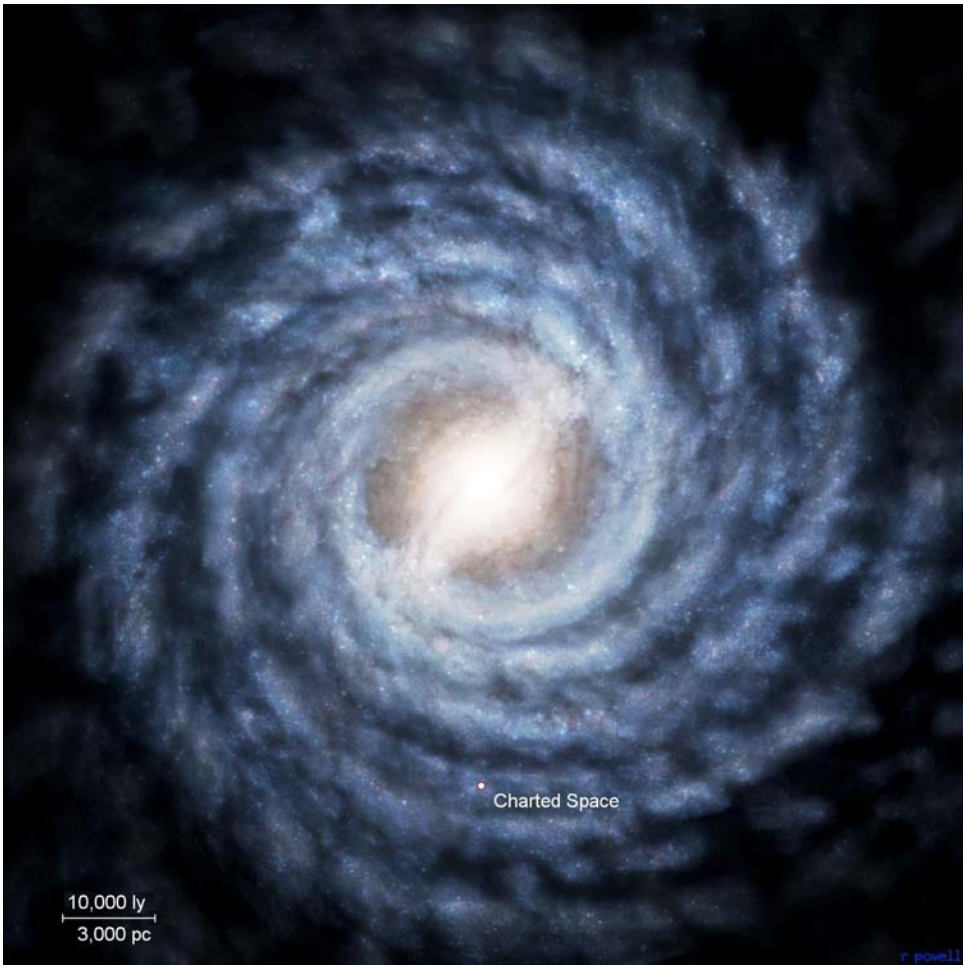
The Core is densely packed with stars, strongly interfering with jump drives. In some parts of the Core, jump is impossible; in other regions, jump is restricted to short distances (often a tenth of a parsec).

The Spiral Arms. Outside of the Core, the Arms are concentrations of stars naturally endowed with plants and naturally hospitable to life.

The Rifts. The Rifts between the Arms have a lower stellar density, and their stars are the dimmer and less useful (typically K and M stars).

What's Out There?

Charted Space is very small portion of the Galaxy. A continuing question is "What is out there that we haven't seen?"



The Office of the Chief Scout produced the final report for the Second Survey of the worlds of the Imperium. The Chief Scout at the same time produced a secret appendix for the eyes of the Emperor alone. The attached redacted text provides frustrating glimpse of what he said.

Secret Appendix to the Second Survey

In addition to our mapping of the Imperium, expeditions and explorations by the Imperial Interstellar Scout Service beyond the Imperial Borders have confirmed [redacted] wherever they go. Based on explorations, and on information from various cultures which have been contacted, we reliably conclude the potential for other encounters:

[redacted] insurmountable barriers merely venturing to [redacted]

[redacted] face barriers to venturing beyond their [redacted]

[redacted] For reasons which are undear, the occurrence of [redacted] Scotum Crux Arm is at [redacted]

Essaray. Explorers have seen evidence [redacted] worlds [redacted] Level-29 Threat.

The Ancients. Contrary to previous evidence, we now [redacted] (and may have actually settled) [redacted] Galaxy.

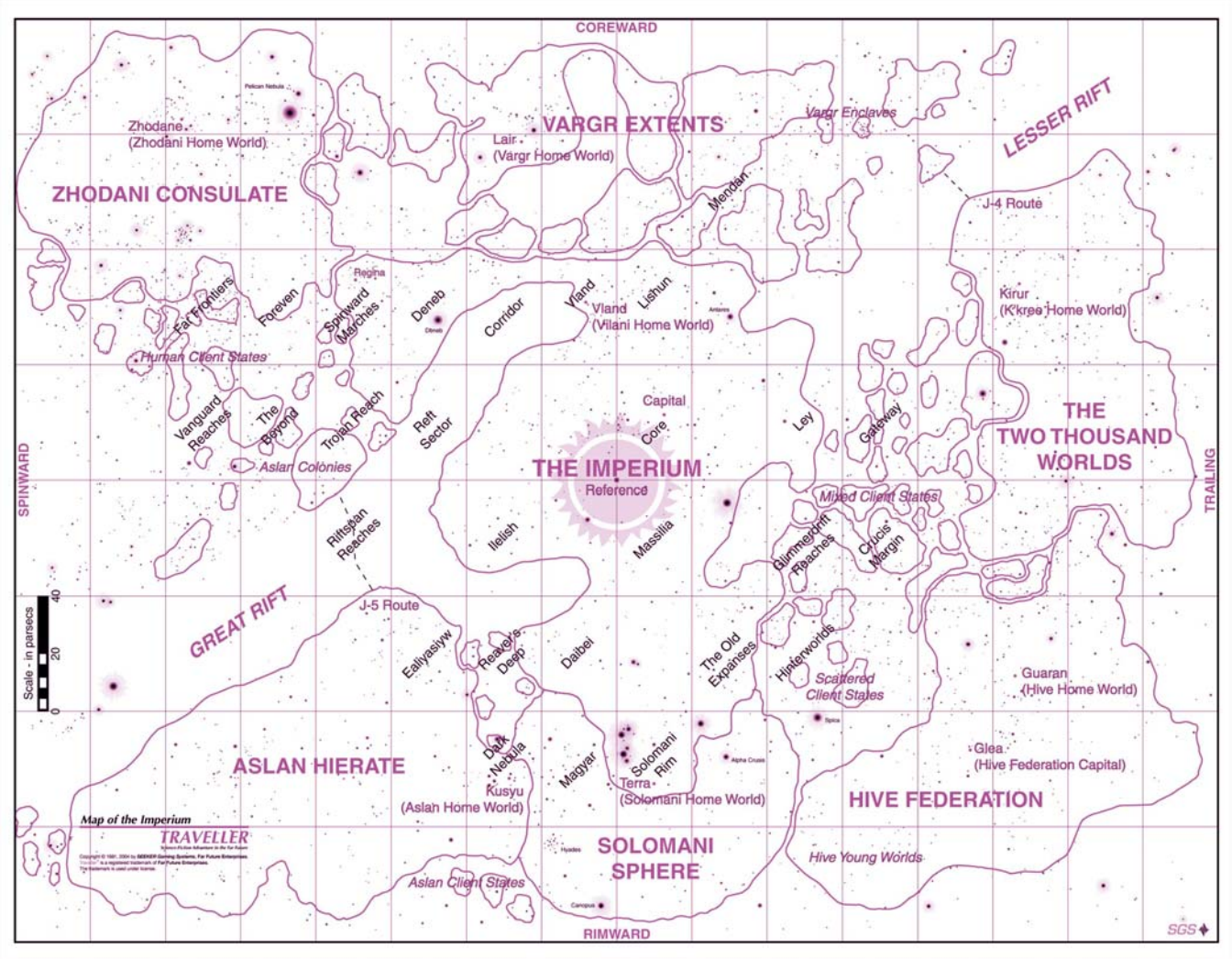
The People of the Core. We have reports of sophont cultures thriving within the Core.

Plasple. [redacted] theoretically possible in [redacted], and some [redacted] intelligences [redacted] Big Bang.

[redacted] absolute Zero

Charted Space

Within the vast Galaxy, only a small portion has been reliably explored by Humanity. This region, called Charted Space, is 400 parsecs in diameter (more or less) and reflects the systems of the Imperium and its neighbors.



CHARTED SPACE

In the vastness of the Galaxy, the region explored by humanity extends some 200 parsecs in all directions from the Third Imperium.

The region is divided, for mapping purposes into Sectors and Subsectors.

Sectors and Subsectors

The vastness of Charted Space is mapped in a series of Sectors and Subsectors.

Interstellar mapping charts the locations of stars and their systems on a plane of hexagons. Each hex represents a parsec and may be a stellar hex containing a star system, or an empty deep space hex.

SECTORS

The standard large-scale interstellar mapping structure is the Sector. It consists of 36 columns of 40 hexes with alternating columns slightly offset as required by the hexagon structure.

Subsectors. A Sector is divided into sixteen smaller Subsectors, each containing 8 columns of 10 rows of hexes.

Subsectors are useful because they easily fit on one page.

THE STELLAR HEX

The basic unit of interstellar mapping is the **Stellar Hex**: a mapping hexagon representing an area about one parsec in diameter.

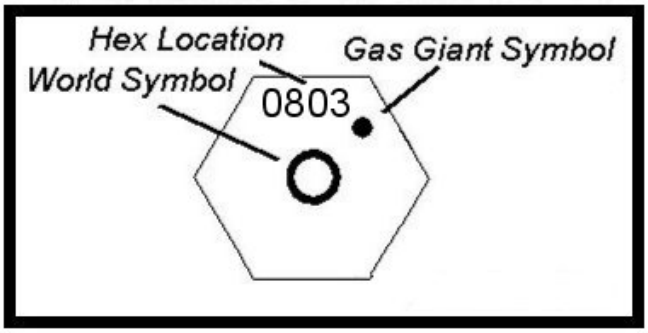
Hexagons are used for mapping because they regularize and simplify movement. They allow simple counting of distance in six directions (as opposed to four with square grids).

Stellar Hex Information

Each Stellar Hex provides some measure of information about its contents. The total information available varies. For distant, unexplored regions, the hex may be empty, or it may contain only rudimentary information. For well-mapped areas, the Stellar Hex provides a wealth of information.

Hex Location. The coordinate system for hexes on larger maps refers to columns and rows. The first two digits of the Hex Location is the column number (on sector maps = 01 through 36). The second two digits is the row number (on sector maps (=01 through 40). Blanks to the left are padded with zeros.

THE STELLAR HEX (Basic Information)

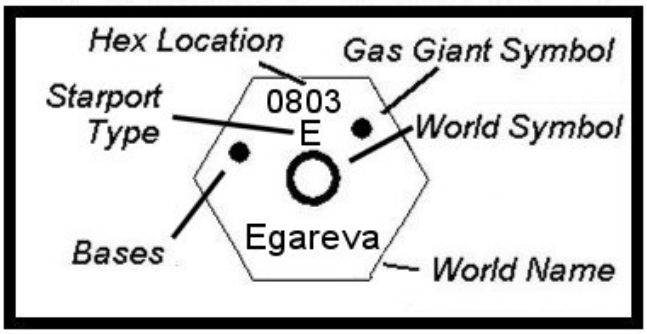


A traveller considering a jump into a new hex can usually determine (through local data bases, or conversations with others) some basic information about its contents.

World. The World Symbol shows a world (otherwise undefined or undescribed) is present.

Gas Giant. Similarly, a Gas Giant symbol shows the presence or absence of a giant world with hydrogen atmosphere suitable for wilderness refueling.

THE STELLAR HEX (Long Range Information)



For well-mapped stellar hexes, more information is available.

Starport Type shows the expected facilities available in a system.

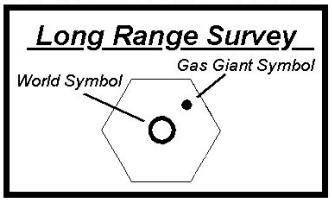
Bases shows the presence of military, naval, or scout bases.

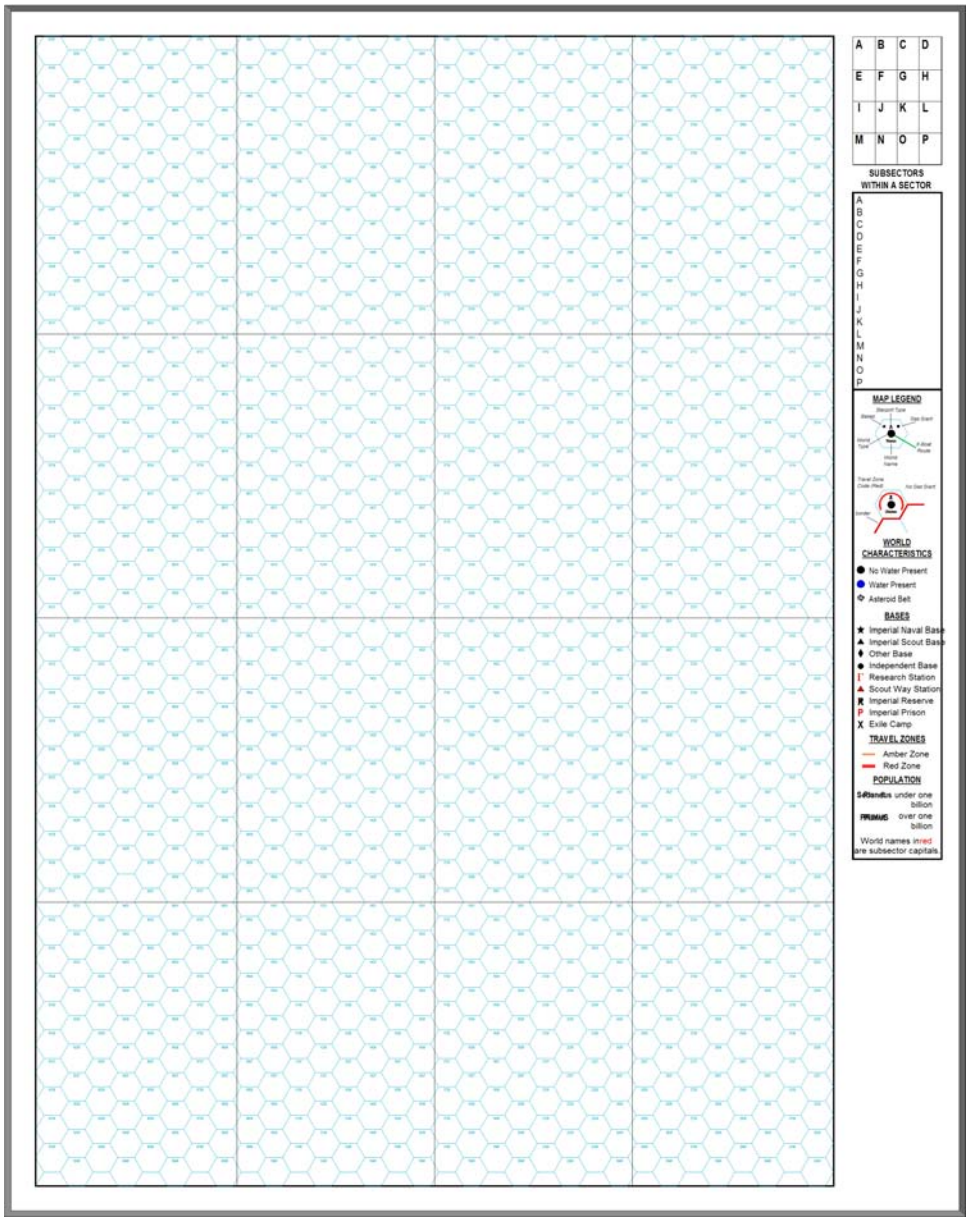
World Name provides the name of the Mainworld.

Sector Mapping

Star Systems are mapped on Sector grids to allow long range analysis and for astrogation by travellers.

STAR MAP SYMBOLS





THE SECTOR MAP

A sector map shows the general presence of star systems and mainworlds across a large region of space.

The first step in mapping a large region is to populate a blank sector map with **system hexes** (which contain star systems) and **deep space hexes** (which are purportedly or generally known to be empty).

The Sector Map is an overview: just enough data to support long range astrogation (some printed or high-resolution maps show more).

The Sector Map shows:

A. It shows the presence or absence of systems.

B. It shows the presence or absence of gas giants (to support refueling).

POPULATING THE SECTOR MAP

Determine (select) the overall map density and note any regions of greater or lesser density.

For each hex, roll on the table and mark the symbols.

SYSTEM CONTENTS

1D	Sparse	Standard	Dense
1	SG	SG	SG
2	S	SG	SG
3		S	SG
4			S
5			
6+			

SG= System with Gas Giant

S= System (no Gas Giant)

ASTEROIDS

Mark one system in 36 as an Asteroid Belt.

Method One. Roll 2D for each system. A roll of 2 = Asteroid Belt.

Method Two. Count off every 36th system and mark it as Asteroid Belt.

SubSector Mapping

Star Systems are mapped on Sector grids to allow long range analysis and for astrogation by travellers.

THE SUBSECTOR MAP

A subsector map shows a portion of the sector map with greater detail. Where the sector provides an overview, the subsector allows greater astrogation detail.

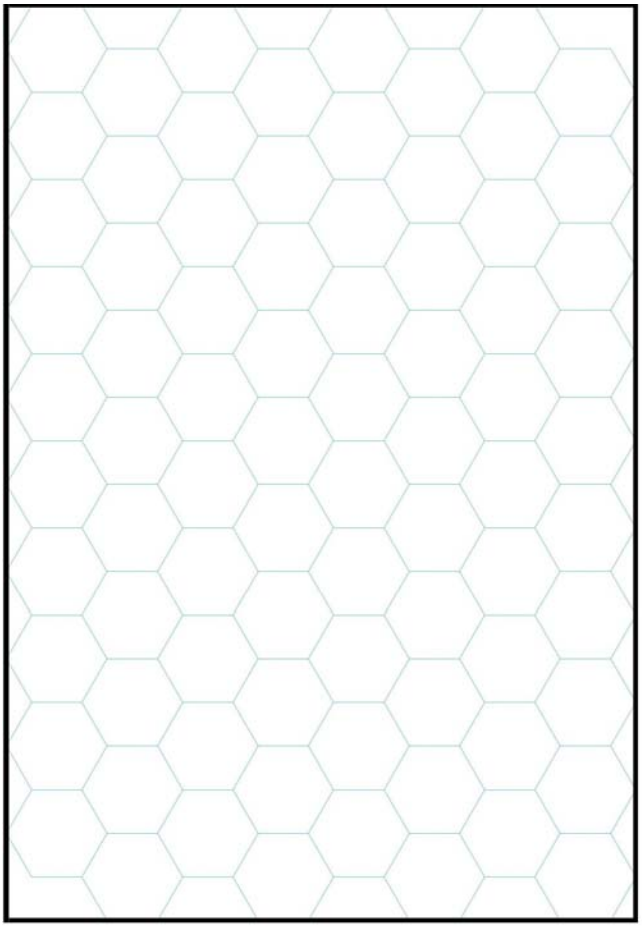
If a Sector Map has been created, transfer the data to the Subsector Map.

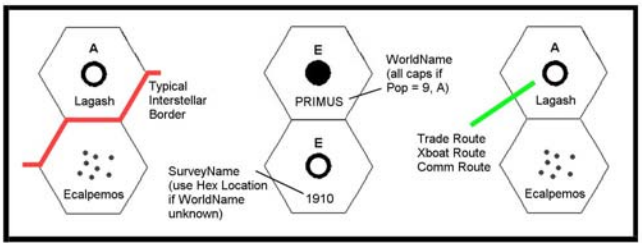
SUBSECTORS WITHIN A SECTOR

A	**B**	**C**	**D**
E	**F**	**G**	**H**
I	**J**	**K**	**L**
M	**N**	**O**	**P**

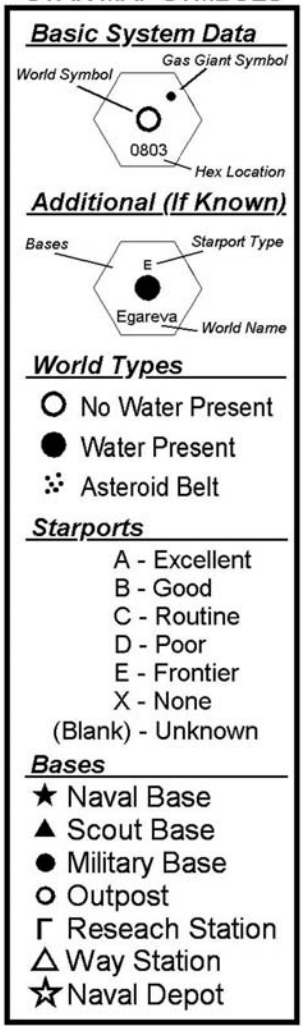
If creating a Subsector Map, the Sector Map creation procedures are followed:

Populate a blank subsector map with **system hexes** (which contain star systems) and **deep space hexes** (which are purportedly or generally known to be empty).





STAR MAP SYMBOLS



POPULATING A SUBSECTOR MAP

Determine (select) the overall map density and note any regions of greater or lesser density.

For each hex, roll on the table and mark the symbols.

TRADE ROUTES

Once the details of individual worlds are known, Trade Routes can be established and traced on the map.

SYSTEM CONTENTS

1D	Sparse	Standard	Dense
1	SG	SG	SG
2	S	SG	SG
3		S	SG
4			S
5			
6+			

SG= System with Gas Giant

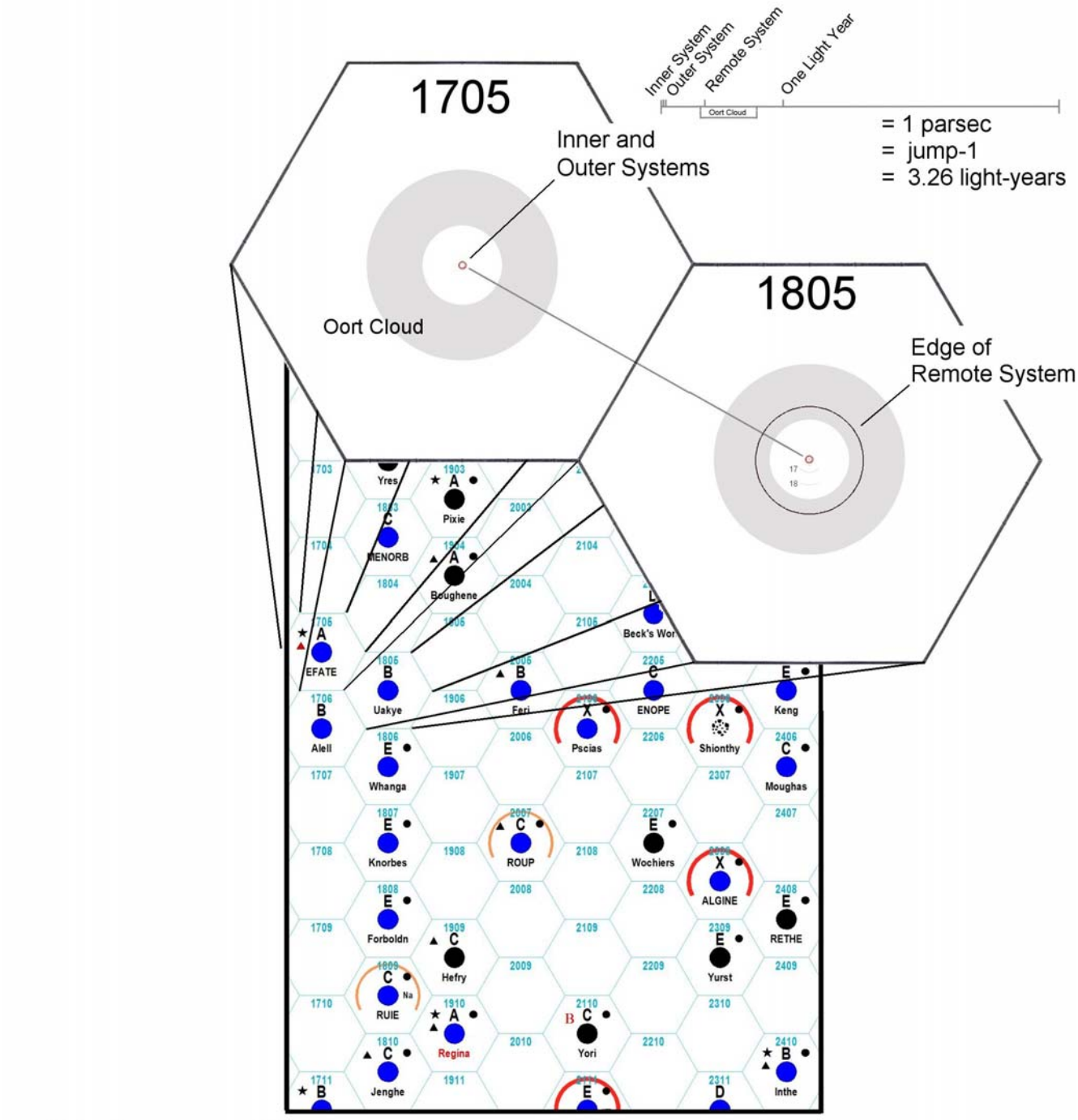
S= System (no Gas Giant)

ASTEROIDS

Mark one system in 36 as an Asteroid Belt.

Method One. Roll 2D for each system. A roll of 2 = Asteroid Belt.

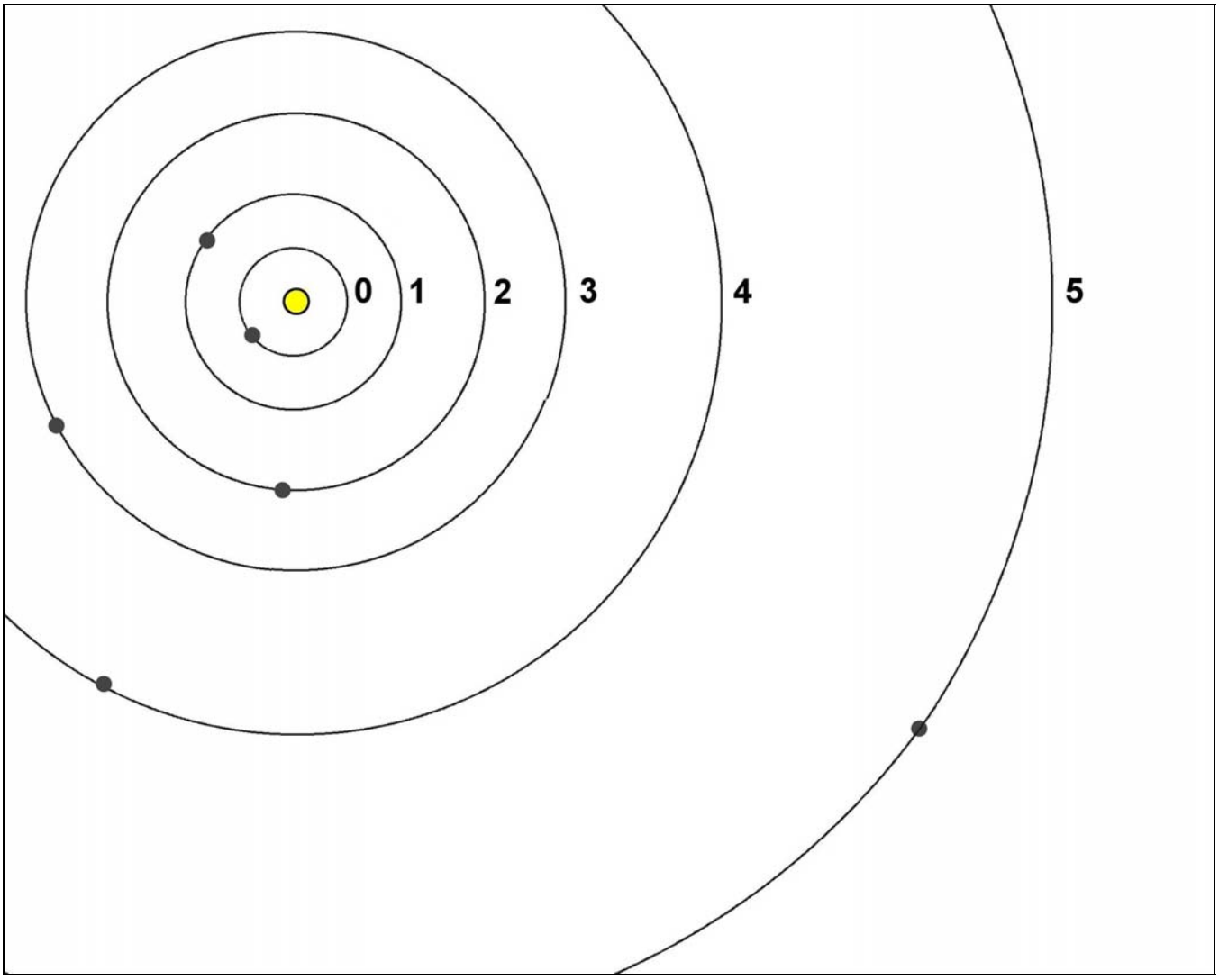
Method Two. Count off every 36th system and mark it as Asteroid Belt.



Star Systems

Each system hex is the potential home to a central system and perhaps several subordinate systems.

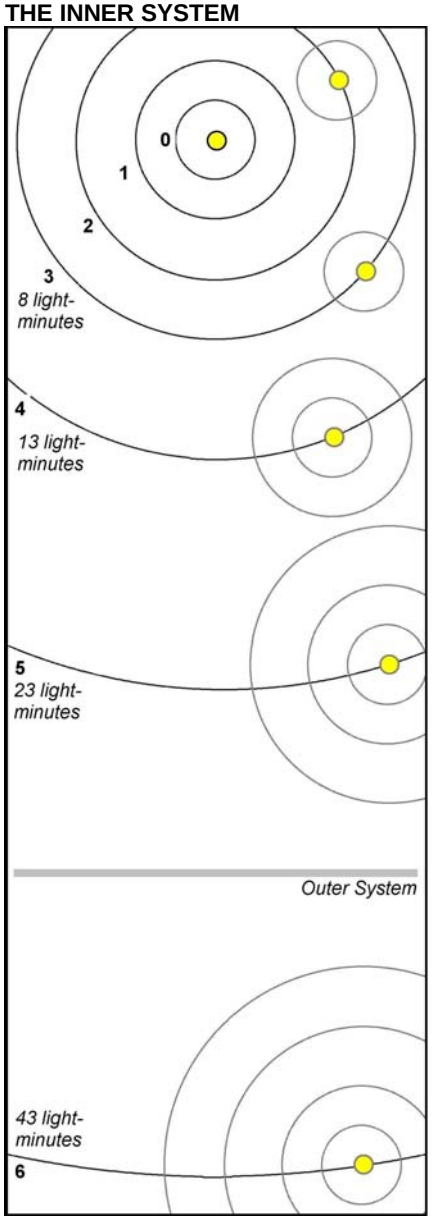
THE TYPICAL STAR SYSTEM



The Typical Star System Contains:

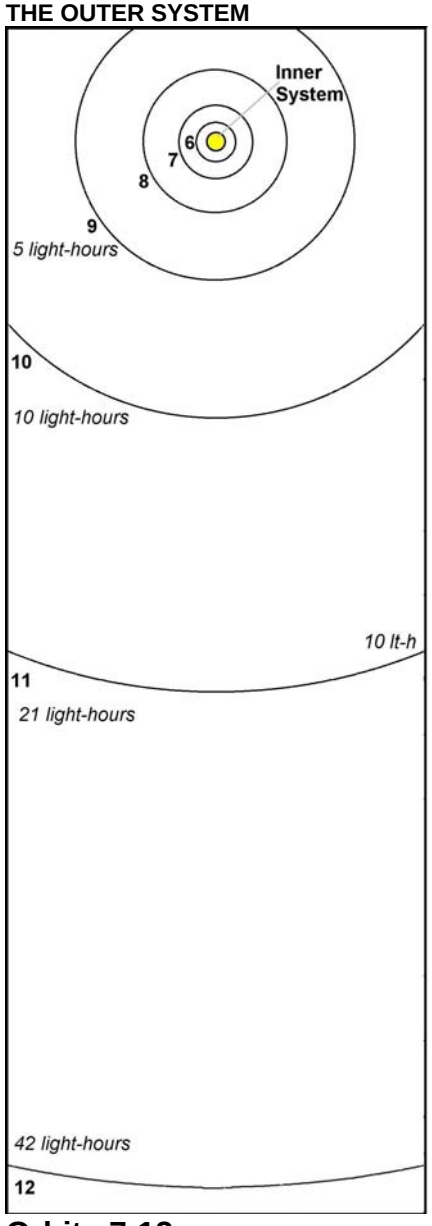
A Central Star
Orbits numbered 0 (zero) upward
Worlds (including planets, gas giants, and asteroids) occupying some (or all) of these orbits.

THE INNER SYSTEM



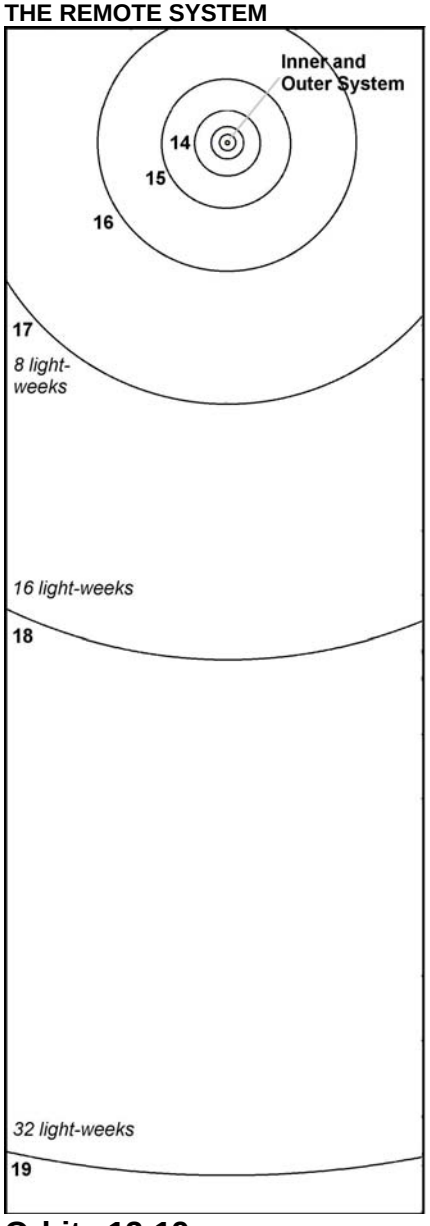
Orbits 0-6

THE OUTER SYSTEM

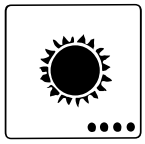


Orbits 7-12

THE REMOTE SYSTEM



Orbits 13-19



Star Systems and Their Worlds

Star systems contain accumulations of stars, gas giants, and worlds.

Traveller System Generation is a process that provides increasing levels of detail and complexity as a Star System is explored.

MOARN Map Only As Really Necessary. Some journeys stop only momentarily in star systems; the information required about that is little more than the type of world present and perhaps the location of a gas giant for starship refueling. Other systems create a need for extensive information: details of several worlds, the location of companion stars, and even information about worlds in the remote or outer system.

Traveller System Generation is a hierarchical process which can be started and stopped as the situation requires. The referee need create only as much information as the players need; as more is required, more can be generated.

UNDERSTANDING STAR SYSTEMS

A star system consists of a central star and a family of planets.

Multiple Stars. Some systems have more than one star. The central star is the Primary. There may be other stars which are Close (Orbits 0-1-2-3-4-5), Near (6-7-8-9-10-11), or Far (Orbits 12-13-14-15-16-17). Each of these stars may have a Companion which is extremely close.

Orbits. Each star is encircled by a series of Orbits number beginning with 0 and extending as far as Orbit-19. Orbits are numbered to correspond to these in the Solar System (that is, 1= Mercury, 2= Venus, 3= Earth). An additional Orbit-0 is allowed inside the orbit of Mercury.

Worlds. Each star may have a variety of worlds: planets, gas giants, asteroid and planetoid belts, satellites, and worldlets.

The Mainworld

The focus of each system is its Mainworld: the single most important world in the system. If the Mainworld has a high population, other worlds in the system are probably explored and even settled. If the Mainworld has a low population, the other worlds in the system are likely barren.

The Mainworld is the world referenced in astrogation data bases and is generally the destination of most travelers entering the system (just as Terra is the likely destination of those visiting the Sol system).

DESCRIBING SYSTEMS

Star systems are recorded and described on a series of FillForms. Most systems can be described on the Inner System FillForm which covers the central star and orbits 0 through 6. Where necessary, additional Fillforms can be used for the Outer System and the Remote System.

CREATING STAR SYSTEMS AND THEIR WORLDS

The process of creating star is governed by the System Generation Checklist and Charts A through G.

A SYSTEM CHECKLIST

The System Checklist details the steps to be taken in creating star systems.

The Second Survey Format

When large data bases of system information are called for, they can be presented in the Second Survey Format: one line per star system showing the Mainworld of the system and other data appropriate for astrogation.

Sector Name

The Sector Name is known before the information is created, as is the hex location of the system.

B MAINWORLD

The Mainworld is the most important world in the system. The first step in system creation is generation of information about the Mainworld.

Starport. The starport is on the Mainworld. Other spaceports (for other worlds) can be created later in the process.

Mainworld Type. The Mainworld may be a Planet occupying an orbit, or it may be a Satellite orbiting a Gas Giant (or a larger planet). It is possible for a Planet Mainworld to be an Asteroid Belt (determined when World Size is generated).

If the Mainworld is a Satellite, Flux determines the Orbit name (a letter from Ay to Zee) and if it is Close or Far from its world.

The Habitable Zone

The Habitable Zone is that region in a star system which is hospitable to humans (and many similar sophonts).

Inner System Reference Chart H and Outer System Reference Chart J show the orbits which are in the Habitable Zone for various star types.

HZ is the abbreviation for Habitable Zone. An orbit is the HZ allows the world to have liquid water and climate hospitable to humans and similar sophonts.

HZ+1 is one orbit farther from the star; the resulting climate is Cold (at the lower edge of human endurance).

HZ-1 is on orbit closer to the star; the resulting climate is Hot (near the upper limits of human endurance).

Twilight Zone. A Planet in Orbit 0 or Orbit 1 is tidally locked to its star. Although the world may be in the HZ, hospitable conditions are present only in a narrow Twilight Zone.

Locked. A Satellite in Close Orbit to its planet is Locked to it; Satellites do not have Twilight Zones.

Gas Giants and Belts

The number of Gas Giants in the system and the number of Planetoid Belts can be generated.

Gas Giants in a system = 2D /2 -2 (ignore fractions and treat less-than-zero as zero) which produces a range from 0 to 4 with some chance of none at all. This value is for the entire stellar hex regardless of the number of subsystems.

Planetoid Belts in a system = 1D – 3 (ignore fractions and treat less-than-zero as zero) which produces a range from 0 to 3 with a fair chance of zero. This value does not include the Mainworld if it is an Asteroid Belt. For terminology purposes, an Asteroid Belt is a Mainworld; an Planetoid belt is not a Mainworld.

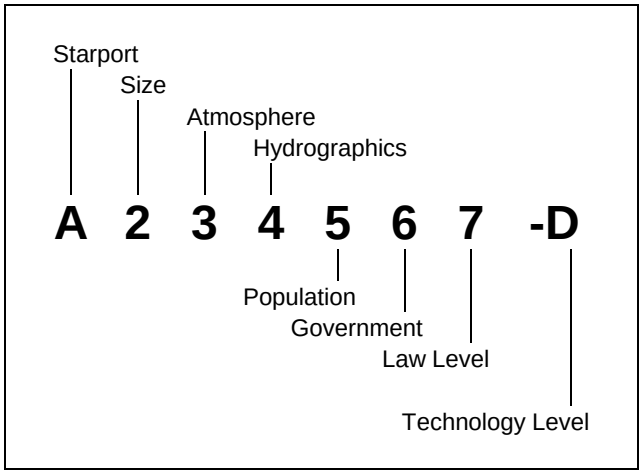
Using Chart B

Chart B provides basic information about the Mainworld. Ships can look up this information in data bases and can make decisions before setting course for the system. The presence of Gas Giants allows wilderness refueling.

C StSAHPGL-T

The basic information contained in the Universal World Profile can be created with the instructions on the Chart A Checklist.

THE UWP



Using Chart C

Chart C allows the information in the UWP to be decoded and understood.

The instructions for creating the elements of the UWP are appended to each table.

D TRADE CLASSIFICATIONS

The Trade Classifications reflect specific types of information about the Mainworld (and to a lesser extent, other locations in the system).

E THE EXTENSIONS

The Extensions provide additional information about the Mainworld.

The Importance Extension

The **Importance Extension (Ix)** ranks worlds within a region. It can range from +4 to -2. A world with +4 is Important; a world with 0 or less is Unimportant.

Trade Routes. Trade Routes within a sector connect Important Worlds with Jump-4 or less. If such a route is not possible, intermediate connections with less important worlds are possible.

Capitals. The most Important world in a subsector is the Subsector Capital; the most important world in a Sector is the Sector Capital.

When more than one world is of the highest Importance, the one with the most Trade Classifications is considered most Important.

The Economic Extension

The **Economic Extension (Ex)** is a measure of the strength of a world economy and provides basic insights into the economy's structure and capabilities.

The Economic Extension is useful in evaluating the budgets and outputs of a world, and for comparing the economics of different worlds.

By detailing the Resources (= 2D plus GG and Belts), Labor (= by Population), and Infrastructure (= 2D + Importance), a general picture of the economic strength of the World emerges.

Barriers add a handicap: legal, cultural, and social inefficiencies which may increase or reduce overall economic strength.

Resource Units. The Economic Extension can be used to compute the Resource Units of a world (in effect, its world budget).

RU

Resource Units = R * L * I * (5-B)

If any value = 0, use 1 instead (to avoid multiplying by zero).

Resource units can be negative: a world can be a net drain for Resource Units.

Barriers. All economies have barriers to total efficiency. In the Economic Extension, Barriers range from 0 to 10, with higher value values (because of the structure of the formula) being the most destructive to an economy.

In the RU formula, Barriers at 6 or more turn the RUs available negative: the Barriers are so destructive as to make the economy a net drain. Such barriers represent a welfare state; cultural influences which do not value wealth, even physical limitations.

On the other hand, since nearly all economies have barriers, lower-than-expected Barriers are a positive multiplier increasing available RU.

The Golden World. The theoretical (possibly apochryphal) world with maximum values under the Economic Extension would not only have an immense RU value, it would have virtually no Barriers to production: its citizens would value work, production, efficiency, and even customer satisfaction above all else.

Fractional Budgets. RU Resource Units are relative values: they are best understood in comparison to other

worlds. Assuming World Alpha produces RU= 100 and World Beta produces RU= 50, one can assume Alpha has an economy twice the size of Beta.

Similarly, if Alpha has a naval budget for ship production, Beta probably has half that budget.

The Cultural Extension

The **Cultural Extension (Cx)** is a broad insight into the expected social behaviors of the citizens of the world.

F NABZ Nil

Additional Information about the world is produced by Chart F.

Nobility. The Imperium assigns a representative to each mainworld; this imperial Noble interacts with the local government and population, serves as an ambassador, and promotes trade and commerce. This noble may be a local appointed by the Emperor, or may be an offworlder assigned to the post.

When a world has a significant non-human population, the Noble often has a local counterpart who deals with non-human locals.

Allegiance. Worlds within the Imperium owe their loyalty to the empire; worlds just beyond the Imperial borders may be Non-Aligned (carefully maintaining its neutrality), or Client-State (independent, but interacting with the empire at various levels).

Worlds may be members of interstellar groups and owe their allegiance to them.

Bases. Worlds may have bases for military, scout, or naval purposes.

Travel Zones

Some worlds pose a variety of dangers to travelers. The Travel Zone classification system assigns to worlds a basic warning level based on experience.

Most worlds are **Travel Zone Green**: safe (relatively safe) to visit. Green status is assumed within the Imperium unless otherwise posted.

Some worlds are **Travel Zone Red:** dangerous to visitors. The level of danger is severe enough that the world is Interdicted and travel to the world is prohibited (with Trade Classification Forbidden). The level of enforcement of Red Zones varies: some systems are patrolled by Quarantine fleets; others have merely a warning beacon.

Some worlds are **Travel Zone Amber**: visitors are advised to use caution. Travel Zone Amber has two levels: Dangerous and Puzzling, each reflected in a Trade Classification.

Amber worlds with low population (Pop= 6 or less) are labeled Amber if local conditions may prove to be dangerous (as reflected by the low population). Amber worlds with higher population (Pop= 7 or more) may require caution by visitors, but the fact that large numbers live on the world makes the classification less about danger and more about intriguing or exotic conditions.

Native Status

Most worlds capable of supporting native intelligent live have a (or had a now-extinct) population of sophonts. The chart identifies the status of such sophonts.

System Stars

The precise number of stars in a system and their spectral types can be created using the charts.

About half of all star systems will be single stars without companions.

It is possible for a system to have eight stars: A Primary and a Companion, a Close star in the inner system and its Companion, a Near star in the Outer System and its companion, and a Far star in the Remote system and its Companion (the chance of such a system is extremely small).

Stellar Spectral Type

The precise spectral identity of the stars in the system are generated using the Spectral Type chart.

The Size of Additional Star Systems

The number of available orbits for system stars is restricted.

The Primary Star may have orbits out to Orbit-19 (not all need be, or will be, filled).

Close, Near, and Far stars may fill orbits around them to their own Orbit minus 3. For example, a Close Star in orbit 3 around its Primary can have no (= 3 – 3) planet orbits. A Far star in Orbit 17 around its Primary can have planets in orbits around it out to Orbit 14 (= 17 – 3).

The Sub Orbit Column of the Orbital Distance Chart 5a (in the Ranges Chapter) shows available orbits.

G PLACING WORLDS

Chart G places the Mainworld in a specific Orbit and creates and places other worlds in the system. If the supply of worlds exceeds the available orbits, the excess worlds are ignored.

Placing Worlds

Worlds in a system must be places in orbits.

The Placing Worlds Chart provides priorities and deals with several exceptions.

The Mainworld is placed first. If it is a satellite, then a Gas Giant must be placed in that orbit to accommodate it. If there is no Gas Giant in the system, then a BigWorld (Size=-2D +7) must be placed in that orbit.

If the Mainworld is an Asteroid Belt, it is placed using the Belt Column of the Basic Placement Chart without regard to Habitable Zone.

Rotate Placement. The Placing Worlds Chart calls for Rotating Placement of various worlds in the system. If the system has more than one star (Close, Near, Far), place the first of the worlds concerned in orbit around the Primary, the second in orbit around the Close, the third in orbit around the Near, and the fourth in orbit around the Far (if possible). Repeat the process if necessary.

Precluded Orbits. Some stars re so large that they engulf some of the orbits in the system and preclude their availablility.

The Surface of the Star… Column of the Orbital Distance Chart 5a (in the Ranges Chapter) shows preculuded orbits.

Worlds other than the Mainworld are subject to restrictions: Maximum Population is Mainworld Population minus 1. All worlds other than the Mainworld have Spaceports rather than Starports.

Other Worlds

The creation of additional worlds uses a simplified procedure:

Inner Worlds are in orbits HZ minus 2 or more.

Hospitable Worlds are in orbits HZ – 1 to HZ +1.

Outer Worlds are in orbits HZ +2 or greater.

Consult the charts to determine the specific type of world and then create it using the information from the Other Worlds column.

Similar tables direct the creation of Satellites as necessary.

Hospitables are potentially habitable or exploitable worlds located in the Habitable Zone.

Planetoids are the worldlets of a Belt. The Population, Government, and Law Level represent the general level throughout the Belt.

Iceworlds are frozen worlds beyond the HZ.

RadWorlds are worlds with extreme levels of radiation. Local values for RadWorlds are provided in Range Table 3b Strangeworlds.

Infernos are worlds with extremes of temperature. Local values for Infernos are provided in Range Table 3b Strangeworlds.

BigWorlds are worlds with larger than expected Size. Occasionally, a satellite Mainworld in a system without Gas Giants requires a BigWorld as its primary. Bigworld may also occur throughout a system.

Worldlets are worlds with generally small Size.

Inner Worlds are located starward of the Habitable Zone.

Stormworlds are worlds wracked by constant atmospheric turbulence. Local values for Stormworld are provided in Range Table 3b Strangeworlds.

Satellites

When necessary, satellites for worlds and for gas giants can be generated.

Ring. The table may create one or more Rings.

Even More Worlds

This system does not create the many small chunks of rock and ice throughout most systems.

THE REGINA SYSTEM

Hex 1910 of the Spinward Marches sector was created as an example using charts.

A

The Sector Name is known: The Spinward Marches.
The Hex Location is already known: 1910.
The Mainworld Name is Regina.

B

Starport= 2D=4 = Type A. Excellent Quality.
Mainworld Type= Flux = - 4 = Far Satellite.
Satellite Orbit = Flux = -2 = Arr.
Habitable Zone Variance = Flux = 0 = no variance.
Climate (based on HZ=0) = Temperate.
Gas Giants = 2D / 2 - 2 = 10 / 2 – 2 = 3.
Planetoid Belts = 1D – 3 = 2 – 3 = 0.

C

Mainworld Size = 2D – 2 = 7 = 7,000 miles diameter.
Atmosphere = Flux + Size = +1 + 7 = 8 = Dense.
Hydrographics = Flux + Size = +1 + 7 = 8 = 80 of the world surface is covered by seas.
Population = 2D – 2 = 8. Hundreds of millions.
Government = Flux + Pop = +1 + 8 = 9 = Impersonal Bureaucracy.
Law Level = Flux + Gov = +0 + 9 = 9 = High Law.
Tech Level = 1D + Mods (Starport A = +6) = 4 + 6 = 10. TL-10 = approximately 2100 AD.

D

Trade Classifications =
Rich (Atm=8, Pop=8).
Pre-Agricultural (Atm=8, Hyd=8, Pop=8).
Pre-High (Pop= 8).

E.

Importance Extension = { +4 } = Important.
= Starport A = +1, TL A = +1, Rich = +1, Pre-Ag = +1.
Economic Extension = (A8B6)
Resources= 2D + GG + Belts = 7 + 3 + 0 = 10 = A.
Labor = Pop = 8.
Infrastructure = 2D + Importance = 7 + 4 = 11 = B.
Barriers = 2D - 2 = 6
Cultural Extension = [6C5C]
Homogeneity = Pop + Flux = 8 -2 = 6.
Acceptance = Pop + Importance = 8 + 4 = 12 = C.
Strangeness = 2D – 2 = 5.
Symbols = TL + Flux = 10 + 2 = 12 = C.

F

Nobility = cCe = Baronet, a Baron, and a Viscount
Based on Rich, Pre-Ag, Pre-High.
Allegiance = Im = a member world of the Imperium.
Bases = NS
Naval Base from the table. 2D = 5 = Yes.
Scout Base from the table. 2D = 3 = Yes.
Travel Zones. Imposed by the Referee. = None.
Native Status. Based on Pop 7 or greater and Atm 2 or greater, the world has a Native population.

System Stars

The system automatically has a Primary.
Primary Companion = Flux = +4 = Yes.
Close Star = Flux = 0 = No. Near Star = Flux = -2 = No.
Far Star = Flux = +4 = Yes.
Far Star Companion = Flux = +1 = No.

The Regina system has a Primary and a Companion, and a Far star in the remote system, and without a companion.

Stellar Data

Primary = F7 V. Primary Spectral Type = Flux = -1 = F. Primary Spectral Decimal = use the Even Distribution Table from Dice = 7. Primary Size = Flux = 0 and consult the Spectral F column = V.

Primary Companion = DM. Companion Spectral Type = -1 + 1D-1 = 4 = M. Companion Decimal = 4. Companion Size = Flux + 1D -1 +3 = +7 = D. Spectral decimal is ignored for Size= D.

Far Star = M6 V. Spectral Type = Flux + 1D -1 = 0 + 3 = M. Spectral Decimal = 6. Stellar Size = Flux + 1D -1 = 0 + 2 = 2 = V.

Place the Stars in orbits. The Primary is the central star of the system. Its Companion orbits it inside Orbit 0. The Far star is in orbit 11 + 1D = 11 + 5 = Orbit 16.

G

Total Worlds In The System = 1+ 3 + 0 + 2D = 1+ 3 + 0 + 8 = 12.

Mainworld. Regina is in the HZ. The Inner System Reference map shows the HZ for the Primary F7 V is Orbit 4. Because Regina is a Satellite, place a Gas Giant in Orbit 4. Regin orbits the Gas Giant.

Gas Giants. The system has three Gas Giants.

The first Gas Giant has been placed in Orbit 4 of the Inner System. Consult the GG Table for its details = 2D = 7 = Siz S (80,000 miles diameter = about equal to Jupiter). It is a Large Gas Giant LGG.

Place the second Gas Giant. HZ= 4. Consult the GG Table for its details = 2 = Siz M (30,000 miles diameter). It is a Small Gas Giant SGG. Consult the Basic Placement Chart for SGG location = 2D = 2 = HZ-2. Place the GG in Orbit 4 -2 = Orbit 2.

Rotate placement of Gas Giants through the systems.

Place the third Gas Giant orbiting the M6 V Far star (begin a new Inner System Fillform for the star). The HZ for an M6 V is Orbit 0. Consult the GG Table for its details = 5 = Siz Q (60,000 miles diameter). It is a Small Gas Giant SGG. Convert it to an ice Giant. Consult the Basic Placement Chart for IG location = 2D = 2 = HZ+2. Place the IG in Orbit 0 + 2 = Orbit 2.

The system has no Planetoid Belts.

Create world 5 of the system's 12. On World1 Column, 2D = 5 = Orbit 4 = which becomes a Satellite of the Gas Giant in Orbit 4. As a Satellite in Orbit 4, consult the HZ Hospitables Satellite table = 1D = 4 = Hospitable. Determine its orbit from the World and Orbits Table Chart B = Flux = -1 = Satellite Orbit Eff. Create the Spaceport = Mainworld Pop -2D + 5 = 8 – 2 + 6 = 0 = Starport F. Create World Size = 2D -2 = 5.

Continue the process of world creation Atm=6 Hyd=4 Pop= 6 Gov = 6 Law = 9. TL = 6.

SystemGen Checklist

Use the procedures in this Checklist to create star systems and their component worlds.

A

Checklist

The Second Survey Format

Hex	Name	UWP StSAHPGL-T	TC and Rem	{ Ix } (Ex) [Cx]	N	B	Z	PBG	W	A	Stellar
0810	Miigamshiirshag	E300000-0	As Hi In Va Ci	{ -2 } (8056) [7685]	B	-	-	624	7	Im	M1 V M6 VII

The Second Survey Format shows tabular information about a star system (and especially its Mainworld) for ready reference in astrogation, merchant trade, and general inquiries. It consists of the following details.

THE ELEMENTS OF SYSTEM DATA

Sector. The Sector Name and general identity is created and known before this proceess begins.

Hex. The hex location identifier for the location of the system within the sector.

Mainworld Name. The generally accepted name of the Mainworld of the system. Generated by the referee.

UWP. The standard Universal World Profile (in the format StSAHPGL-T) for the Mainworld in the system.

TC Trade Classifications. The Trade Classifications (and Remarks) for the mainworld.

Ex Extensions. Guides to the character of the Mainworld: Importance, Economic, and Cultural.

N Nobility. Within the Imperium, the noble rank of the individual assigned by the Empire as representative to the MainWorld. More than one is possible.

Bases. The nature of Military, Naval, and Scout bases on the world.

Z Travel Zone. Guidance about potential dangers on the World.

PBG Population Belts Giants. Three digits 0-9 representing he significant digit for the population of the Mainworld, the number of Planetoid Belts in the System, and the number of Gas Giants in the system.

W Worlds. The number of worlds in the system = MainWorld + Belts + Gas Giants + Stars + 2D. This number does not include Worldlets and Satellites (other than the Mainworld if is a Satellite).

A Allegiance. The larger government to which the system owes allegiance (if any).

Stellar. The Spectral identification of the stars of the system.

MOARN Map Only As Really Necessary.

The charts allow the star system creation process to be started and stopped as necessary. There is no need to create complete or comprehensive maps before they are needed.

MASTER SYSTEM GENERATION CHECKLIST

A	1		Sector Name and Hex Location.
	2		Mainworld Name.
B		St	Starport. =2D for Starport Type.
			MainWorld Type. =Flux for (Planet or Satellite).
			If Satellite, =Flux for Satellite Orbit Name.
			Habitable Zone Variance. =Flux
			Climate. Note based on HZ.
			Gas Giants. =2D /2 -2.
			Planetoid Belts. =1D -3.
C	3		StSAHPGL-T
		S	World Size. = 2D-2.
		A	Atmosphere: =Flux + Size. If Siz =0, Atm =0.
		H	Hydrographics. =Flux+ Size + Mods. Max= A.
		P	Population. =2D-2.
		G	Government. =Flux +Pop.
		L	Law. =Flux + Gov.
		T	Tech Level. =1D + Mods.
D	4	TC	Trade Classifications. Note all required.
			Defer Secondary, Political, Special TC.
E	5		Extensions.
		Ix	Importance Extension.
		Ex	Economic Extension.
		Cx	Cultural Extension.
F	6		Additional Data.
		N	Nobility. Based on Trade Classifications.
		A	Allegiance. Imposed by referee.
		B	Bases. Naval. Scout. Depot. Way Station.
		Z	Travel Zones. Imposed by referee.
		Nil	Native Intelligent Life and Status.
	7		System Stars
			Star Spectral Types
G	8	W	Total Worlds In the System.
			Mainworld Placement.
			Gas Giant Placement
			Planetoid Belt Placement
			Create other Worlds

Mainworld

Create the essential details for the Mainworld using the tables on this page.

B

Basics

ABOUT THE MAINWORLD

The Mainworld is the most important world in the system (although the world may well be not very important).

This page allows the creation of basic information about a Mainworld appropriate for astrogation planning.

CHECKLIST

1. Starport. 2D for Starport Type.
2. MainWorld Type. Flux for Mainworld Type (Planet, Satellite).
A. If Satellite, Flux for Orbit Name.
3. Habitable Zone Variance. Flux for Location in HZ.
4. Climate. Note based on HZ.
5. Gas Giants. Roll 2D /2 -2.
6. Planetoid Belts. Roll 1D -3.

IMPORTANT TERMS

World. A planet or satellite.
Planet. A world orbiting a star.
Satellite. A world orbiting a planet.
Mainworld. The most important world in a system.
Belt. An asteroid belt (which may be a mainworld) or a planetoid belt.
Gas Giant. Massive hydrogen-atmosphere planet.

St STARPORTS

The Starport on the Mainworld

2D	Type	Quality	Yards	Repairs	Fuel	Downport	Highport	Bases
2 3 4	**A**	Excellent	Starships	Overhaul	Both	Yes	if Pop =7+	Naval Base Possible Scout Base Possible
5 6	**B**	Good	Spacecraft	Overhaul	Both	Yes	if Pop =8+	Naval Base Possible Scout Base Possible
7 8	**C**	Routine	No	Major Damage	Unrefined	Yes	if Pop =9+	Scout Base Possible
9	**D**	Poor		Minor Damage	Unrefined	Yes		Scout Base Possible
10 11	**E**	Frontier		No	No	Beacon		
12	**X**	None		No	No	No		

SPACEPORTS

Spaceports on non-MainWorlds

Roll	Type	Quality	Yards	Repairs	Fuel	Downport	Highport	Bases
2	**F**	Good	No	Minor Damage	Unrefined	Yes	No	Fa Farming Possible.
3	**G**	Poor	No	Superficial	Unrefined	Yes	No	Mi Mining Possible.
4 5	**H**	Primitive	No	No	No	Beacon	No	Co Colony Possible. Pe Penal Colony Possible.
6+	**Y**	None	No	No	No	No	No	Re Reserve Possible.

Roll= (Mainworld Pop – 2D) +5.

This table is shown for reference.

WORLDS AND ORBITS

Flux	Main World	HZ Variance	Satellite Orbit Close	Far
- 6	Close Satellite	- 2	Ay	En
- 5	Far Satellite	- 1	Bee	Oh
- 4	Far Satellite	- 1	Cee	Pee
- 3	Close Satellite	- 1	Dee	Que
- 2	Planet	0	Ee	Arr
- 1	Planet	0	Eff	Ess
0	Planet	0	Gee	Tee
+1	Planet	0	Aitch	Yu
+2	Planet	0	Eye	Vee
+3	Planet	+1	Jay	Dub
+4	Planet	+1	Kay	Ex
+5	Planet	+1	Ell	Wye
+6	Planet	+2	Em	Zee

Mainworld. Is it Planet or Satellite?
HZ Variance. Determine the variation from the Habitable Zone.
Satellite Orbit. Note orbit name.

CLIMATE

Mark Mainworld orbit with its Climate.

HZ	=Temperate	
HZ - 1	=Hot	
HZ +1	=Cold	
HZ = 0 or 1	=Twilight Zone	= Tz
Close Satellite	=Locked	= Lk

Hot. Upper human endurance limit.
Cold. Lower human endurance limit.
Twilight Zone. A world in Orbit 0 or 1 is tidally locked and has a Temperate band at the Twilight Zone, plus a Hot hemisphere facing the Primary and a Cold hemisphere away from the Primary.
Locked. A Close Satellite (Ay through Em) is Locked to its planet. Satellites do not have Twilight Zones.

GAS GIANTS AND BELTS

Determine the number of Gas Giants and Planetoid Belts in the syste (Ignore fractions; treat less than zero as zero).

Gas Giants = 2D /2 - 2
Planetoid Belts = 1D -3

SAHPGL-T (Next Pages)

S. Size. Planetary Size: 2D-2.
A. Atmosphere: Flux + Size.
If Size =0, Atmosphere =0.
H. Hydrographics. Flux+ Size.
Maximum A. If Size =0-1, Hyd =0;
If Atm =0-1 or A+, Hyd DM - 4.
P. Population. 2D-2.
G. Government. Flux +Pop.
L. Law. Flux + Gov.
Convert negative values to 0.
TL. Tech Level. 1D + Mods.

(convert all values less than 0 to 0).

The UWP

Create and understand the elements of the Universal World Profile using these tables.

C

StSAHPGL-T

S SIZE

Digit	Diameter	
0	Asteroid Belt	
1	1,000 miles	1,600 km
2	2,000 miles	3,200 km
3	3.000 miles	4,800 km
4	4,000 miles	6,400 km
5	5,000 miles	8,000 km
6	6,000 miles	9,600 km
7	7,000 miles	12,200 km
8	8,000 miles	13,800 km
9	9,000 miles	14,400 km
A	10,000 miles	16,000 km
B	11,000 miles	17,600 km
C	12,000 miles	19,200 km
D	13,000 miles	20,800 km
E	14,000 miles	22,400 km
F	15,000 miles	24,000 km

Siz= 2D -2. If =10, reroll 1D + 9.

A ATMOSPHERE

Digit	Description	Effects
0	Vacuum	S3
1	Trace	S3
2	VThin, Tainted	P1 S2
3	VThin	S2
4	Thin, Tainted	P1 S1
5	Thin	S1
6	Standard	
7	Standard, Tainted	P1
8	Dense	
9	Dense, Tainted	P1
A	Exotic	P1
B	Corrosive	C1 P1
C	Insidious	C2 P1
D	Dense High	varies
E	Ellipsoid	varies
F	Thin Low	varies

Atm= Flux + Size. If Siz=0, Atm =0.

H HYDROGRAPHICS

Digit	Description
0	Desert World.
1	10% water.
2	20% water.
3	30% water.
4	40% water.
5	50% water.
6	60% water.
7	70% water.
8	80% water.
9	90% water.
A	Water World.

Hyd= Flux+ Size. Max= A. If Siz =0-1, Hyd =0; If Atm =0-1, A+, Hyd DM - 4.

P POPULATION

Digit	Description
0	unpopulated
1	tens
2	hundreds
3	thousands
4	ten thousands
5	hundred thousands
6	millions
7	ten millions
8	hundred millions
9	billions
A	ten billions
B	hundred billions
C	trillions
D	ten trillions
E	hundred trillions
F	quadrillions

Pop= 2D -2. If = 10, reroll 9 + 1D.

G GOVERNMENT

Digit	Description
0	**No Government Structure.** Family bonds predominate.
1	**Company/ Corporation.** Rule by a managerial elite.
2	**Participating Democracy.** Rule by popular vote.
3	**Self-Perpetuating Oligarchy.** Rule by a restricted minority with little or no input from the masses.
4	**Representative Democracy.** Government by proxy.
5	**Feudal Technocracy.** Governmental relationships based on mutually beneficial technical activities.
6	**Captive Government / Colony.** Rule by a leadership answerable to an outside group.
7	**Balkanization**. Rival governments compete for control.
8	**Civil Service Bureaucracy.** Rule by agencies employing individuals selected by merit.
9	**Impersonal Bureaucracy.** Rule by impersonal agencies.
A	**Charismatic Dictatorship.** Government by a single leader enjoying the confidence of the citizens.
B	**Non-Charismatic Dictatorship.** Government by the successor to a charismatic dictator.
C	**Charismatic Oligarchy.** Government by a select group, organization, or class enjoying the overwhelming confidence of the citizenry.
D	**Religious Dictatorship.** With little or no regard for the needs of the citizenry.
E	**Religious Autocracy.** Government by a single religious leader having absolute power over the citizenry.
F	**Totalitarian Oligarchy.** Government by an all-powerful minority which maintains absolute control through widespread coercion and oppression.

Gov= Flux + Pop. Gov greater than F = F.

L LAW LEVEL

Digit	Description
0	**No Law.** No prohibitions.
1	**Low Law.** Prohibition of WMD, Psi weapons.
2	**Low Law**. Prohibition of "Portable" Weapons.
3	**Low Law.** Prohibition of Acid, Fire, Gas weapons.
4	**Moderate Law.** Laser, Fusion, Plasma weapons prohibited.
5	**Moderate Law.** Prohibition of Shock, EMP, Rad, Freeze, Mag, Grav weapons.
6	**Moderate Law.** Prohibition of MachineGuns.
7	**Moderate Law**. Prohibition of Pistols.
8	**High Law.** Open display of weapons prohibited.
9	**High Law.** Weapons outside the home prohibited.
A	**Extreme Law.** Weapon possession prohibited.
B	**Extreme Law.** Regional passports required.
C	**Extreme Law.** Unrestricted invasion of privacy.
D	**Extreme Law.** Paramilitary law enforcement.
E	**Extreme Law.** Full-fledged police state.
F	**Extreme Law.** Daily life rigidly controlled.
G	**Extreme Law.** Disproportionate punishments.
H	**Extreme Law.** Legalized oppressive practices.
J	**Extreme Law.** Routinely oppressive and restrictive.

Law= Flux + Gov. Law Level greater than J = J.

TECH LEVEL= 1D +

Starport A= +6. B= +4. C= +2. X= -4. F=+1
Siz 0 1= +2. Siz 2 3 4= +1.
Atm 0 1 2 3 = +1. Atm A B C D E F = +1.
Hyd 9 = +1. Hyd A= +2.
Pop 1 2 3 4 5 = +1. Pop 9 = +2. Pop A= +4.
Gov 0 5 = +1. Gov D = -2.

The Technology Chapter defines Tech Levels.

Trade Classifications

Create the applicable Trade Classifications for the Mainworld. As necessary, create the applicable Trade classifications for other worlds in the system.

D

TCs

Group	Code	Siz	Atm	Hyd	Pop	Gov	Law	Definition -- Formula
Planetary	As	0	0	0	--	--	--	Asteroid Siz= 0.
	De	--	23456789	0	--	--	--	Desert Hyd= 0. Atm= 2-9
	Fl	--	ABC	123456789A	--	--	--	Fluid Atm= A+. Hyd= 1+
	Ga	678	568	567	--	--	--	Garden World
	He	3456789A	2479ABC	012	--	--	--	Hellworld
	Ic	--	01	123456789A	--	--	--	Ice-Capped
	Oc	ABC	--	A	--	--	--	Ocean World Hyd=A, Siz= A+
	Va	--	0	--	--	--	--	Vacuum Atm=0
	Wa	56789	--	A	--	--	--	Water World Hyd=A. Siz = 9 -.
Population	Di	--	--	--	0	0	0	Dieback (000-T) PGL=000. TL>0
	Ba	--	--	--	0	0	0	Barren PGL-T=000-0
	Lo	--	--	--	123	--	--	Low Population Pop= 1-3
	Ni	--	--	--	456	--	--	Non-industrial Pop= 4-6
	Ph	--		--	8	--		Pre-High Pop=8
	Hi	--	--	--	9ABC	--	--	High Population Pop=9+
Economic	Pa	--	456789	45678	48	--	--	Pre-Ag Atm= 4-9. Hyd= 4-8. Pop= 4,8
	Ag	--	456789	45678	567	--	--	Ag Atm= 4-9. Hyd= 4-8. Pop= 567
	Na	--	0123	0123	6789ABC	--	--	Non-Ag Atm= 3-. Hyd= 3-. Pop=6+
	Pi	--	012479	--	78	--	--	Pre-Ind Atm=Vac or Taint. Pop=7,8
	In	--	012479	--	9ABC	--	--	Industrial Atm=Vac or Taint. Pop=9+
	Po	--	2345	0123	--	--	--	Poor Atm=2-5. Hyd=3-
	Pr	--	68	--	59	--	--	Pre-Rich Atm=6,8. Pop-5,9.
	Ri	--	68	--	678	--	--	Rich Atm=6,8. Pop=6-8
Climate	Fr	23456789	--	123456789A	--	--	--	Frozen Siz=2-9. Hyd=1+. HZ +2 or outer
	Ho	--	--	--	--	--	--	Hot HZ -1
	Co	--	--	--	--	--	--	Cold HZ+1
	Lk	--	--	--	--	--	--	Locked Close Satellite
	Tr	6789	456789	34567	--	--	--	Tropic HZ -1
	Tu	6789	456789	34567	--	--	--	Tundra HZ +1
	Tz	--	--	--	--	--	--	Twilight Zone Orbit 0-1
Secondary	Fa	--	456789	45678	23456	--		Farming Not MW. HZ
	Mi	--	--	--	23456	--		Mining Not MW. MW=In.
	Co	--	--	--	56789A	6	0123	Colony
	Pe	--	--	--	34567	6	6789	Penal Colony
	Re	--	--	--	1234	6	45	Reserve
Political	Cp	--	--	--	--	--		Subsector Capital
	Cs	--	--	--	--	--		Sector Capital
	Cx	--	--	--	--	--		Capital
	An	--	--	--	--	--		Ancient Site
	Ab	--	--	--	--	--		Data Repository
Special	Sa	--	--	--	--	--	--	Satellite
	Fo	--	--	--	--	--	--	Forbidden (Red Zone)
	Pz	--	--	--	789ABC	--	--	Puzzle (Amber Zone)
	Da	--	--	--	0123456	--	--	Danger (Amber Zone)

Ba requires Starport E, X. Cp, Cs, Cx require Starport A. Politicals and Specials assigned by Referee (not generated).
Lk, Ho, and Co refer to climate but are not properly TCs.

The Extensions

Create the Importance Extension, Economic Extension, and Cultural Extension for the system.

E

Ix Ex Cx

Ix THE IMPORTANCE EXTENSION

{ +4 }

The **Importance Extension** is contained between {braces}.

The **Importance Extension (Ix)** ranks worlds within a region. It governs the locations of capitals and trade routes.

IMPORTANCE EXTENSION=

Characteristic	Value
Starport Type A or B	+1
Starport D or worse.	- 1
TL A or more	+1
TL 7 or less	- 1
per Ag Hi In Pi Ri Pr Pa	+1

Important= +4.
Unimportant= 0 or less.

Trade Routes. Important Worlds are linked by established Trade Routes of J-4 or less.

Capitals. Important worlds are more likely to be Capitals of subsectors and sectors.

Ex THE ECONOMIC EXTENSION

Resources Infrastructure

(RLIB)

Labor Barriers

The **Economic Extension** is contained between (parentheses)].

The **Economic Extension (Ex)** is the strength of a world economy and provides basic insights into the economy's structure and capabilities.

ECONOMIC EXTENSION=

Characteristic	Value
Resources=	2D + GG + Belts
Labor=	Pop
Infrastructure=	2D + Importance
If Ba, Di, Lo, then	= 0. If Ni, then 1D.
Barriers=	2D -2

Resources of a world are any materials available for processing and exploitation. They include natural resources, minerals, ores, metals, energy sources, biological assets, and any other materials of limited availability and suitable for production as goods suitable for sale.

Labor for a world is the workforce available for the processing and exploitation of Resources.

Infrastructure for a world is the established technical structures that support the population, and especially support exploitation of resources. Infrastructure includes roads, power grids, communications systems, and factories.

Barriers are existing inefficiencies in the economy. Barriers include legal impediments to efficiency, tax rates, customs which promote absenteeism or inhibit rewards for merit, and social structures which mismatch ability and job.

RU

Resource Units = R * L * I * (5 - B)

If any value = 0, use 1 instead (to avoid multiplication by zero).

Cx THE CULTURAL EXTENSION

Strangeness
Homogeneity

[HASS]

Acceptance Symbols

The **Cultural Extension** is contained between [brackets].

The **Cultural Extension (Cx)** is a broad insight into the expected social behaviors of the citizens of the world.

CULTURAL EXTENSION=

Characteristic	Value
Homogeneity	=Pop + Flux.
	Less than 0 = 1
Acceptance	= Pop + Importance
Strangeness	5 + Flux
Symbols	TL + Flux

Homogeneity is a measure of the degree to which members of society hold common beliefs. Members of very homogeneous cultures are in strong agreement on the fundamentals of society (usually basic rights, religion, and methods of interaction). Members of non-homogeneous cultures hold many different beliefs on the fundamentals of society.

Acceptance is the degree of xenophobia or xenophilia in the culture. High Acceptance is evidenced by friendliness to outsiders and offworlders; Low Acceptance is characterized by fear or rejection of outsiders.

Strangeness is the degree of difference for the norms of interstellar society.

High Strangeness is evidenced by unusual or outwardly incomprehensible actions, statements, or responses in the course daily activity. Low Strangeness reflects activities close to interstellar norms.

Symbols used by the culture may range from the concrete (idols; totems; statuary) to the abstract (symbolized belief systems; group affiliations).

Importance Extension and the **Economic Extension** apply to the entire system; **Cultural Extension** applies generally to the entire system, although individual worlds may have their own Cultural Extensions.

Additional Information

Note the additional information for the system.

Generate the stars for the system and place them on the appropriate fillforms.

F

NABZ Nil

N NOBILITY

Code	Ranking Noble	TC
A	Gentleman.	
B	Knight	any
c	Baronet	Pa Pr
C	Baron	Ag Ri
D	Marquis	Pi
e	Viscount	Ph
E	Count	Hi
F	Duke	In
G	Archduke	
H	Emperor	

Noble assignment is based on the Trade Classifications of the world.

A ALLEGIANCE

Code	Description
Im	Imperial.
Cs	Client-State
Na	Non-Aligned
Va	Vargr
As	Aslan
Zh	Zhodani
So	Solomani
Kk	K'kree
Hv	Hiver

Many other allegiance abbreviations are possible.

B BASES

Code	Description
N	Naval Base
D	Naval Depot
S	Scout Base
W	Scout Way Station
M	Military Base

A **Depot** is established approximately one per 1000 worlds.

A **Way Station** is placed approximately one per 50 parsecs along major trade routes.

Military Base as needed.

GENERATING BASES

	Naval		Scout			
2D	A	B	A	B	C	D
2	N	N	S	S	S	S
3	N	N	S	S	S	S
4	N	N	S	S	S	S
5	N	N	-	S	S	S
6	N		-	-	S	S
7	-	-	-	-	-	S
8	-	-	-	-	-	-
9	-	-	-	-	-	-
10	-	-	-	-	-	-
11	-	-	-	-	-	-
12	-	-	-	-	-	-

Columns are Starport Types. Roll once for each Base type.

Z TRAVEL ZONES

Code	Description	TC
G	Green	
A	Amber	Da Pz
R	Red	Fo
Da	Dangerous	Pop=0-6
Pu	Puzzling	Pop=7+
Fo	Forbidden	

W WORLDS

Total worlds in the system =

MW + GG + Belts + 2D

NIL NATIVE INTELLIGENT LIFE / NATIVE STATUS

Pop	Atm	TL	Comment	(create sophonts as necessary)
7+	2-9	1+	Intelligent Life evolved on this world.	Natives
7+	A+	1+	Local Intelligent Life is incompatible with human environments	Exotics
7+	0-1	1+	Sophonts evolved elsewhere and settled here many years ago.	Transplants
0	2+	1+	Intelligent Life evolved on this world, but is now extinct.	Extinct
0	0-1	1+	Evidence of Transplants, but they are no longer present.	Vanished
1-2-3			Non-permanent commercial or scientific activity.	Transients
4-5-6			The initial steps of creating a colony.	Settlers
if Gov= 1			Locals are company employees.	Corporate.
if Gov= 6			Locals are colonists from a nearby world.	Colonists.

1 GENERATE SYSTEM STARS

Flux	Primary	Close	Near	Far	Companion
- 5	Primary	--	--	--	--
- 4	Primary	--	--	--	--
- 3	Primary	--	--	--	--
- 2	Primary	--	--	--	--
- 1	Primary	--	--	--	--
0	Primary	--	--	--	--
+1	Primary	--	--	--	--
+2	Primary	--	--	--	--
+3	Primary	Close	Near	Far	Companion
+4	Primary	Close	Near	Far	Companion
+5	Primary	Close	Near	Far	Companion

Primary is always present. Roll Flux for Close, Near, and Far stars in the system. Roll Flux for Companions (if present) to Primary, Close, Near, and Far. A system may have as many as eight stars (Primary + Companion, Close + Companion, Near + Companion, and Far + Companion).

Place Stars In Orbits

Companion = Inside Orbit 0.
Close= 1D -1. In Orbits = 0-1-2-3-4-5
Near = 5+ 1D. In Orbits = 6-7-8-9-10-11
Far = 11 + 1D. In Orbits = 12-13-14-15-16-17

2 SPECTRAL TYPE Size

Flux	Sp	O	B	A	F	G	K	M
- 5	OB	Ia	Ia	Ia	II	II	II	II
- 4	A	Ib	Ib	Ib	III	III	III	II
- 3	A	II	II	II	IV	IV	IV	II
- 2	F	III	III	III	V	V	V	III
- 1	F	III	III	IV	V	V	V	V
0	G	III	III	V	V	V	V	V
+1	K	V	III	V	V	V	V	V
+2	K	V	V	V	V	V	V	V
+3	M	V	V	V	V	V	V	V
+4	M	IV	IV	V	VI	VI	VI	VI
+5	M	D	D	D	D	D	D	D
+6	BD	D	D	D	D	D	D	D

Spectral Type. Roll Flux for the Primary. For all others, Primary Flux + (1D-1).

Spectral Decimal. Roll decimal 0 thru 9.

Stellar Size. Roll Flux for the Primary; For all others, Primary Flux + (1D+2).

Size IV not possible for K5-K9, M0-M9.
Size VI not possible for A0-A9, F0-F4.
If Size= D, ignore Spectral Decimal.
If Spectral= BD, ignore remaining rolls. (BD= Brown Dwarf).

Gas Giants and Other Worlds

Create Gas Giants and place them in orbits on the System Fillform.
Fill other orbits with Other Worlds.

G

Other Worlds

W WORLDS

Total Worlds In System=

+ Mainworld
+ Gas Giants
+ Belts
+ 2D

OTHER WORLDS
Subject to

Max Pop =MW Pop - 1.
St= Spaceport.

Hospitable= StSAHPGL-T

Planetoids= St000PGL-T

Iceworld= StSAHPGL-T
Pop= DM - 6

RadWorld= StSAH000-0
Siz= 2D

Inferno= YSB0000-0
Siz= 2D

BigWorld= StSAHPGL-T
Siz= 2D +7
any with Siz= B+ is BW.

Worldlet= StSAHPGL-T
Siz= 1D - 3

Inner World StSAHPGL-T
Pop= DM - 4
Hyd= DM - 4

Stormworld StSAHPGL-T
Siz= 2D
Atm= DM +4
Hyd= DM - 4
Pop= DM – 6

NUMBER OF SATELLITES

Gas Giants=	1D-1
Inners =	1D-5
Hospitables=	1D-4
Outers=	1D-3

= total number of satellites for the world.

Zero exactly = Ring and reroll. Treat less than zero as none.

PLACING WORLDS

Place Mainworld	**If Satellite,** place GG in MW Orbit. **If Satellite and No Giants**, place a BigWorld in MW Orbit. **If Asteroid Belt,** place as Belt without regard to HZ.
Place Gas Giants	**Rotate Placement Per Star**.
Place Planetoid Belts	**Rotate Placement Per Star**.
Place Other Worlds	**Rotate Placement Per Star**, place worlds using World1 Column. **Last World,** place using World2 Column.

GG GAS GIANTS

2D	Size	WSize	Diameter	Type
1	L	20	20,000 miles	SGG
2	M	21	30,000 miles	SGG
3	N	22	40,000 miles	SGG
4	P	23	50,000 miles	SGG
5	Q	24	60,000 miles	SGG
6	R	25	70,000 miles	LGG
7	S	26	80,000 miles	LGG
8	T	27	90,000 miles	LGG
9	U	28	100,000 miles	LGG
10	V	29	110,000 miles	LGG
11	W	30	120,000 miles	LGG
12	X	31	130,000 miles	LGG

Convert every second SGG Small Gas Giant to IGG Ice Giant (of the same size).

Convert every fifth LGG to a BD Brown Dwarf (of Siz x 4; mark Size with* as in R*).

BASIC PLACEMENT CHART

2D	LGG	SGG	IG	Belt	World1	World2
2	- 3	- 2	+1	- 1	10	17
3	- 2	- 1	+2	HZ	8	16
4	- 1	HZ	+3	+1	6	15
5	HZ	+1	+4	+2	4	14
6	+1	+2	+5	+3	2	13
7	+2	+3	+6	+4	0	12
8	+3	+4	+7	+5	1	11
9	+4	+5	+8	+6	3	10
10	+5	+6	+9	+7	5	9
11	+6	+7	+10	+8	7	8
12	+7	+8	+11	+9	0	7

GG and Belt placement is based on the HZ.
World placement is based on Orbit.
If an orbit is duplicated or precluded, adjust to an adjacent or the closest possible orbit.

Gas Giant Skimming: Ship's G must exceed World Size/8.

The Inner Worlds
= Orbits inside HZ - 1.

The Hospitables
= Orbits HZ-1, HZ, HZ+1.

The Outer Worlds
= Orbits beyond HZ+1.

- HZ INNERS

1D	Description
1	Worldlet
2	Inferno
3	Inner World
4	BigWorld
5	Stormworld
6	Radworld

HZ HOSPITABLES

Code	Description
1	Worldlet
2	Inferno
3	Hospitable
4	BigWorld
5	Stormworld
6	Radworld

+HZ OUTERS

Code	Description
1	Worldlet
2	Iceworld
3	Iceworld
4	BigWorld
5	Iceworld
6	Radworld

INNER SATELLITES

1D	Description
1	Worldlet
2	Worldlet
3	Inferno
4	Inner World
5	Stormworld
6	Radworld
7	Bigworld

HOSPITABLE SATELLITES

1D	Description
1	Worldlet
2	Worldlet
3	Inferno
4	Hospitable
5	Stormworld
6	Radworld
7	Bigworld

OUTER SATELLITES

1D	Description
1	Worldlet
2	Worldlet
3	Iceworld
4	Innerworld
5	Stormworld
6	Radworld
7	Bigworld

DM+1 if satellite of GG.
Close Satellites are Locked to the Planet.
If Satellite Size is equal or greater than Planet Size, reduce it to Planet Size -3.

Inner System Reference

This page shows the locations and distances of the Inner System. Habitable Zones are shown by orbit and Stellar Type.

The Diameter limits for Jump, Maneuver, and Gravitic Drives are shown for Astrogation planning.

H

Inner

THE 100D JUMP DRIVE LIMIT

	Ia	Ib	II	III	IV	V	VI	D
A0	10	9	7	6	5	5		*
A5	10	9	7	5	4	4		*
F0	11	9	7	5	4	3		*
F5	11	9	7	5	4	3	3	*
G0	11	10	8	6	4	2	2	*
G5	12	10	8	7	4	2	1	*
K0	12	11	9	7	5	2	0	*
K5	13	12	10	9		1	0	*
M0	14	13	11	9		1	0	*
M5	15	14	13	11		0	*	*
M9	15	15	13	12		*	*	*

100 D Limit is within the Orbit Number shown.

***** = inside Orbit 0.

Blank (K5-M9 IV, A0-F4 VI). Not possible.

Jump Drives cannot operate inside the 100D Limit.

THE 1000D MANEUVER DRIVE LIMIT

	Ia	Ib	II	III	IV	V	VI	D
A0	13	12	11	9	9	8		*
A5	14	12	10	9	8	7		*
F0	14	12	10	9	8	7		*
F5	14	12	11	9	8	7	7	*
G0	15	13	11	9	8	6	6	*
G5	15	14	12	10	8	6	5	*
K0	16	14	12	10	8	6	5	*
K5	16	15	13	12		6	5	*
M0	17	16	14	12		5	4	*
M5	18	17	16	14		5	2	*
M9	18	18	16	15		4	1	*

1000 D Limit is beyond Orbit Number shown.

***** = inside Orbit 0.

Blank (K5-M9 IV, A0-F4 VI). Not possible.

Maneuver Drives (M-Drives) cannot operate outside the 1000D Limit.

THE 10D GRAVITIC DRIVE LIMIT

	Ia	Ib	II	III	IV	V	VI	D
A0	7	5	4	1	1	0	*	*
A5	7	5	3	1	0	*	*	*
F0	7	6	3	1	0	*	*	*
F5	7	6	4	1	0	*	*	*
G0	8	6	4	1	0	*	*	*
G5	9	7	5	3	0	*	*	*
K0	10	7	6	3	0	*	*	*
K5	10	8	7	5		*	*	*
M0	11	10	8	6		*	*	*
M5	11	11	9	8		*	*	*
M9	12	11	10	8		*	*	*

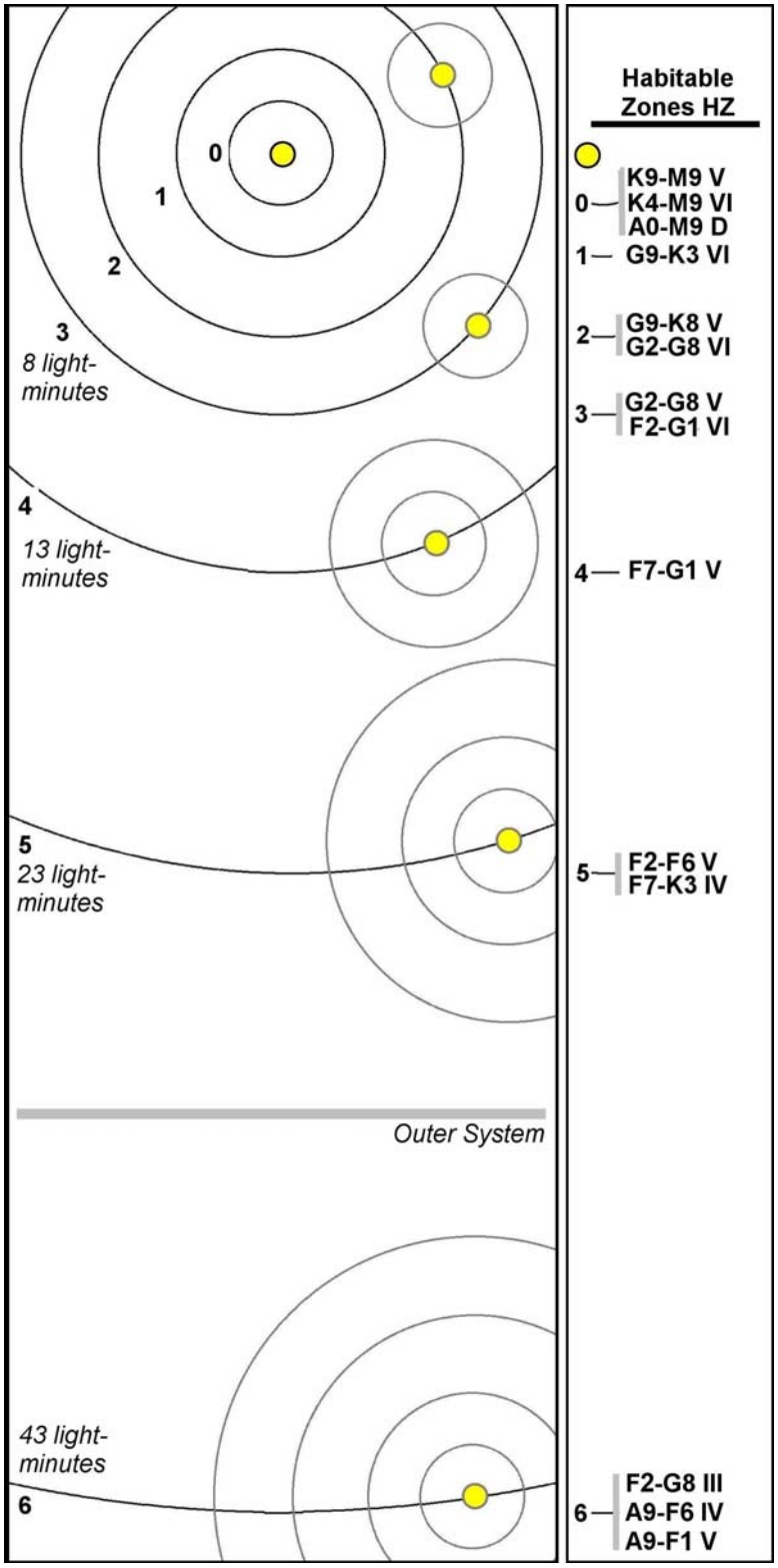
10 D Limit is beyond the Orbit Number shown.

***** = inside Orbit 0.

Blank (K5-M9 IV, A0-F4 VI). Not possible.

Gravitic Drives (G-Drives) cannot operate outside the 10D Limit.

THE INNER SYSTEM



Outer System Reference

This page shows the locations and distances of the Outer System. Habitable Zones are shown by orbit and Stellar Type.

The Diameter limits for Jump, Maneuver, and Gravitic Drives are shown for Astrogation planning.

J

Outer

THE 100D JUMP DRIVE LIMIT

	Ia	Ib	II	III	IV	V	VI	D
A0	10	9	7	6	5	5		*
A5	10	9	7	5	4	4		*
F0	11	9	7	5	4	3		*
F5	11	9	7	5	4	3	3	*
G0	11	10	8	6	4	2	2	*
G5	12	10	8	7	4	2	1	*
K0	12	11	9	7	5	2	0	*
K5	13	12	10	9		1	0	*
M0	14	13	11	9		1	0	*
M5	15	14	13	11		0	*	*
M9	15	15	13	12		*	*	*

100 D Limit is within the Orbit Number shown.

***** = inside Orbit 0.

Blank (K5-M9 IV, A0-F4 VI). Not possible.

Jump Drives cannot operate inside the 100D Limit.

THE 1000D MANEUVER DRIVE LIMIT

	Ia	Ib	II	III	IV	V	VI	D
A0	13	12	11	9	9	8		*
A5	14	12	10	9	8	7		*
F0	14	12	10	9	8	7		*
F5	14	12	11	9	8	7	7	*
G0	15	13	11	9	8	6	6	*
G5	15	14	12	10	8	6	5	*
K0	16	14	12	10	8	6	5	*
K5	16	15	13	12		6	5	*
M0	17	16	14	12		5	4	*
M5	18	17	16	14		5	2	*
M9	18	18	16	15		4	1	*

1000 D Limit is beyond Orbit Number shown.

***** = inside Orbit 0.

Blank (K5-M9 IV, A0-F4 VI). Not possible.

Maneuver Drives (M-Drives) cannot operate outside the 1000D Limit.

THE 10D GRAVITIC DRIVE LIMIT

	Ia	Ib	II	III	IV	V	VI	D
A0	7	5	4	1	1	0	*	*
A5	7	5	3	1	0	*	*	*
F0	7	6	3	1	0	*	*	*
F5	7	6	4	1	0	*	*	*
G0	8	6	4	1	0	*	*	*
G5	9	7	5	3	0	*	*	*
K0	10	7	6	3	0	*	*	*
K5	10	8	7	5		*	*	*
M0	11	10	8	6		*	*	*
M5	11	11	9	8		*	*	*
M9	12	11	10	8		*	*	*

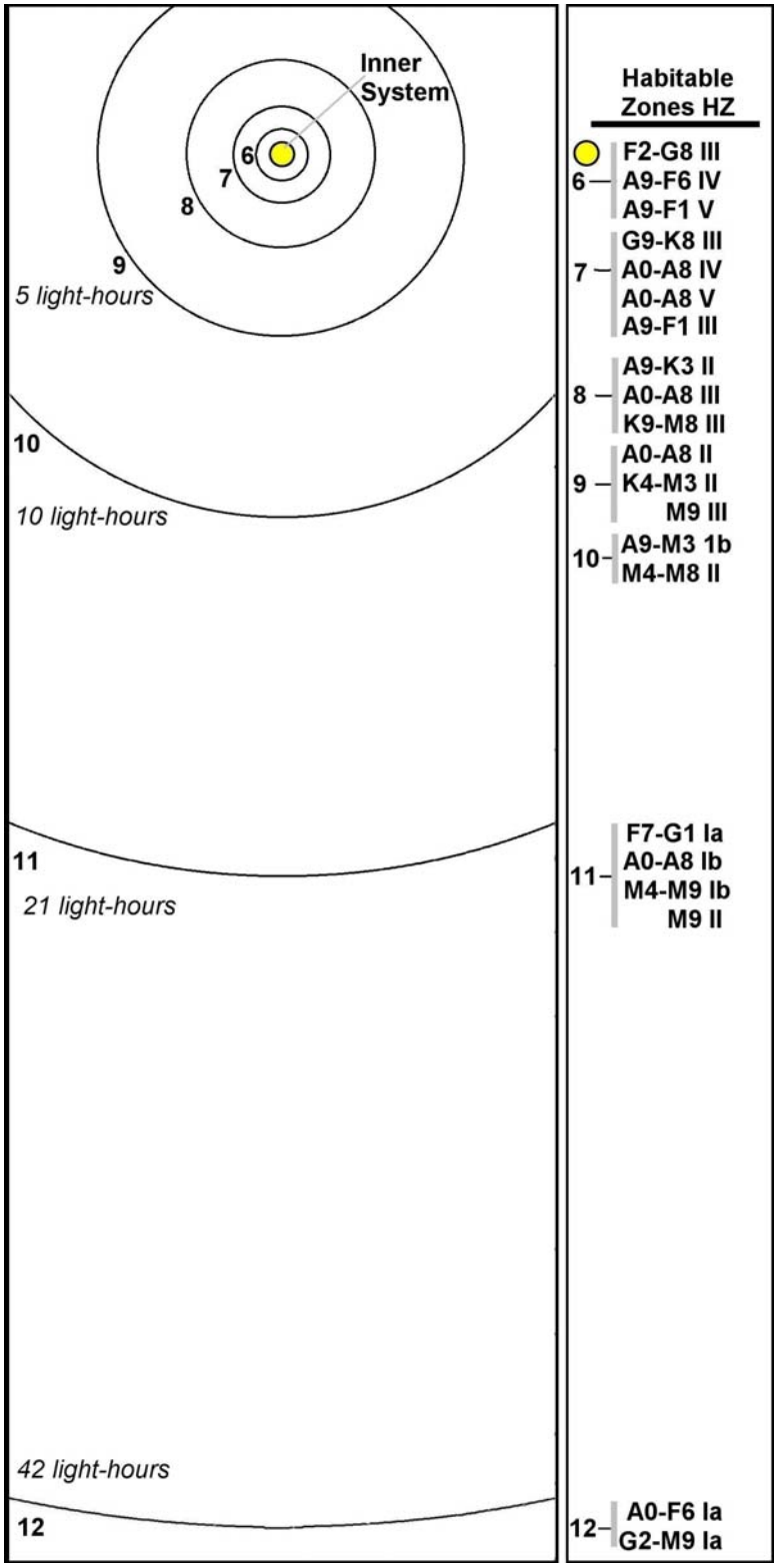
10 D Limit is beyond the Orbit Number shown.

***** = inside Orbit 0.

Blank (K5-M9 IV, A0-F4 VI). Not possible.

Gravitic Drives (G-Drives) cannot operate outside the 10D Limit.

THE OUTER SYSTEM



Remote System Reference

This page shows the locations and distances of the Remote System. The Remote System has no Habitable Zones).

The Diameter limits for Jump, Maneuver, and Gravitic Drives are shown for Astrogation planning.

K

Remote

THE 100D JUMP DRIVE LIMIT

	Ia	Ib	II	III	IV	V	VI	D
A0	10	9	7	6	5	5		*
A5	10	9	7	5	4	4		*
F0	11	9	7	5	4	3		*
F5	11	9	7	5	4	3	3	*
G0	11	10	8	6	4	2	2	*
G5	12	10	8	7	4	2	1	*
K0	12	11	9	7	5	2	0	*
K5	13	12	10	9		1	0	*
M0	14	13	11	9		1	0	*
M5	15	14	13	11		0	*	*
M9	15	15	13	12		*	*	*

100 D Limit is within the Orbit Number shown.

***** = inside Orbit 0.

Blank (K5-M9 IV, A0-F4 VI). Not possible.

Jump Drives cannot operate inside the 100D Limit.

THE 1000D MANEUVER DRIVE LIMIT

	Ia	Ib	II	III	IV	V	VI	D
A0	13	12	11	9	9	8		*
A5	14	12	10	9	8	7		*
F0	14	12	10	9	8	7		*
F5	14	12	11	9	8	7	7	*
G0	15	13	11	9	8	6	6	*
G5	15	14	12	10	8	6	5	*
K0	16	14	12	10	8	6	5	*
K5	16	15	13	12		6	5	*
M0	17	16	14	12		5	4	*
M5	18	17	16	14		5	2	*
M9	18	18	16	15		4	1	*

1000 D Limit is beyond Orbit Number shown.

***** = inside Orbit 0.

Blank (K5-M9 IV, A0-F4 VI). Not possible.

Maneuver Drives (M-Drives) cannot operate outside the 1000D Limit.

THE 10D GRAVITIC DRIVE LIMIT

	Ia	Ib	II	III	IV	V	VI	D
A0	7	5	4	1	1	0	*	*
A5	7	5	3	1	0	*	*	*
F0	7	6	3	1	0	*	*	*
F5	7	6	4	1	0	*	*	*
G0	8	6	4	1	0	*	*	*
G5	9	7	5	3	0	*	*	*
K0	10	7	6	3	0	*	*	*
K5	10	8	7	5		*	*	*
M0	11	10	8	6		*	*	*
M5	11	11	9	8		*	*	*
M9	12	11	10	8		*	*	*

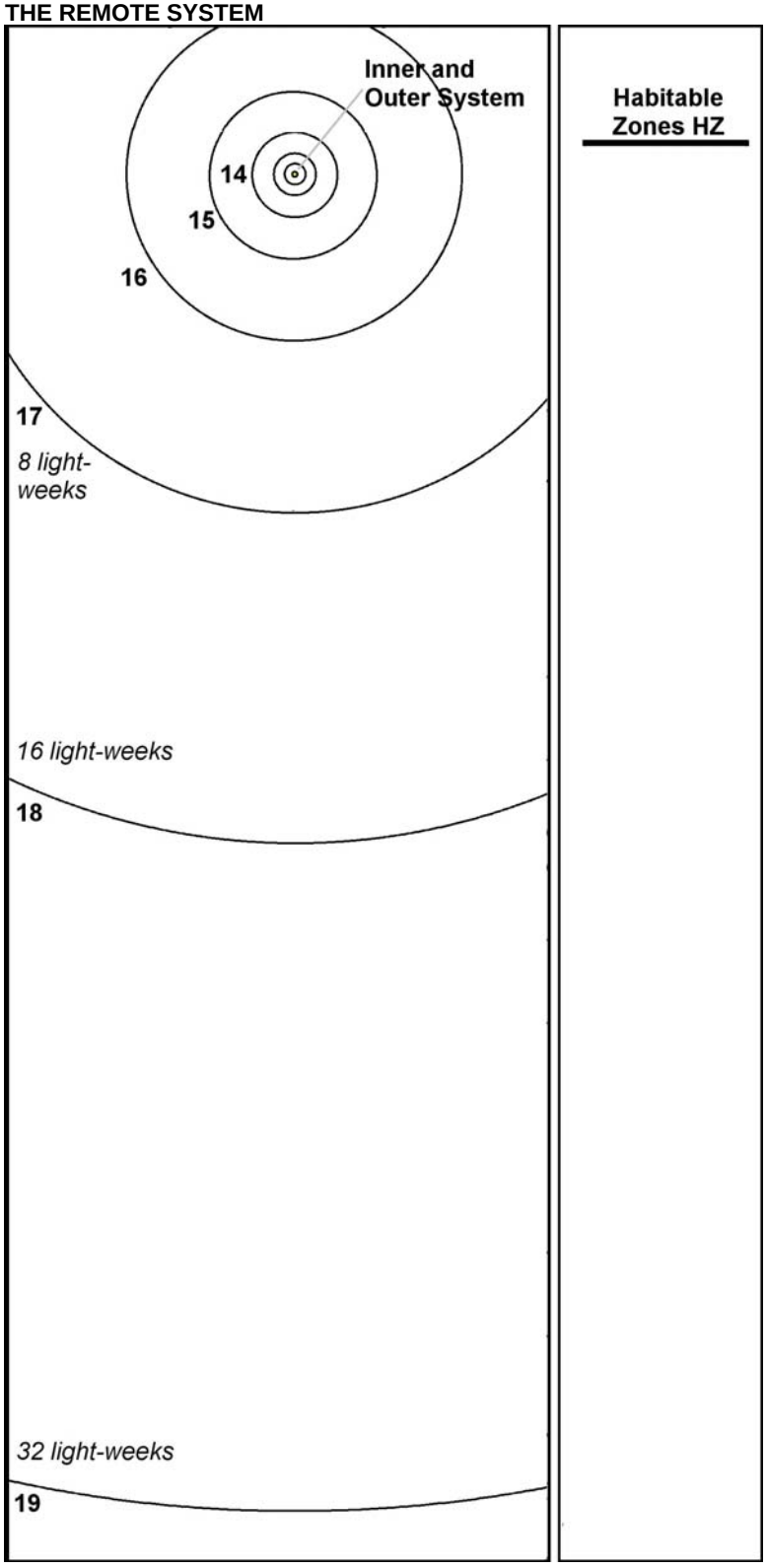
10 D Limit is beyond the Orbit Number shown.

***** = inside Orbit 0.

Blank (K5-M9 IV, A0-F4 VI). Not possible.

Gravitic Drives (G-Drives) cannot operate outside the 10D Limit.

THE REMOTE SYSTEM



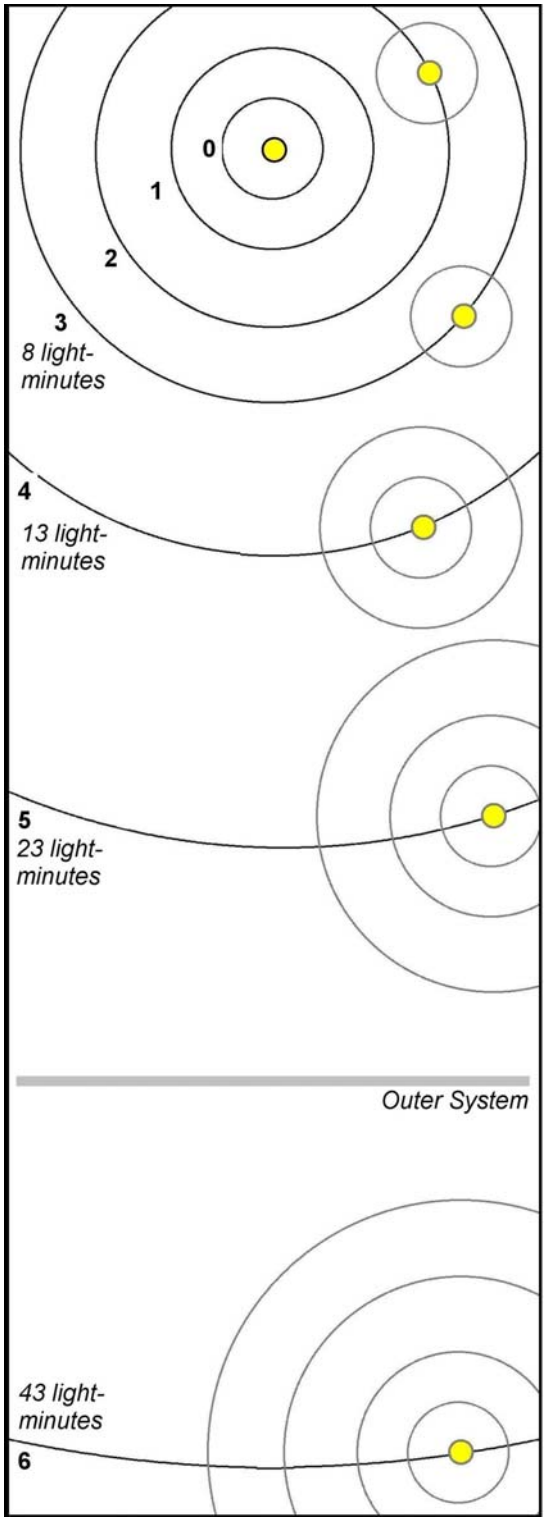
Inner System Fillform

Record the details of the Inner System on this FillForm. Mark worldnames on the map as necessary.

Fillform

Inner

THE INNER SYSTEM



LOCATION AND DETAILS

Location (Sector and Hex)				
Mainworld Name			Star Name and Spectral	
Mainworld Type (Planet or Satellite)			If Satellite, Orbit Name	
HZ Variance	MW Climate	System GG	System Belts	Filled Orbits

MAINWORLD StSAHPGL-T

St	Siz	Atm	Hyd	Pop	Gov	Law	-	Tech		

Trade Classifications and Remarks

Noble	Alleg	Bases	Zone	Ix	Ex	Cx
				{ }	( )	[ ]

Native Status

OCCUPIED ORBITS

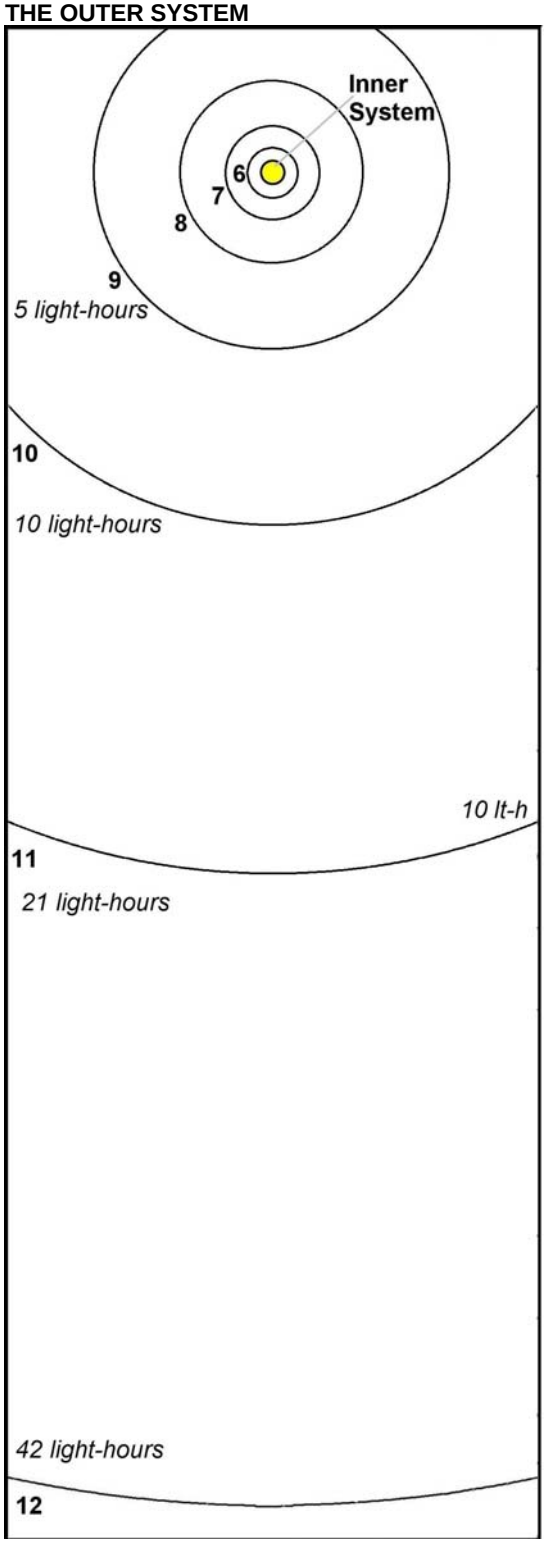
Outer System Fillform

Record the details of the Outer System on this FillForm. Mark worldnames on the map as necessary.

Fillform

Outer

THE OUTER SYSTEM



LOCATION AND DETAILS

Location (Sector and Hex)	
Mainworld Name	Star Name and Spectral

OCCUPIED ORBITS

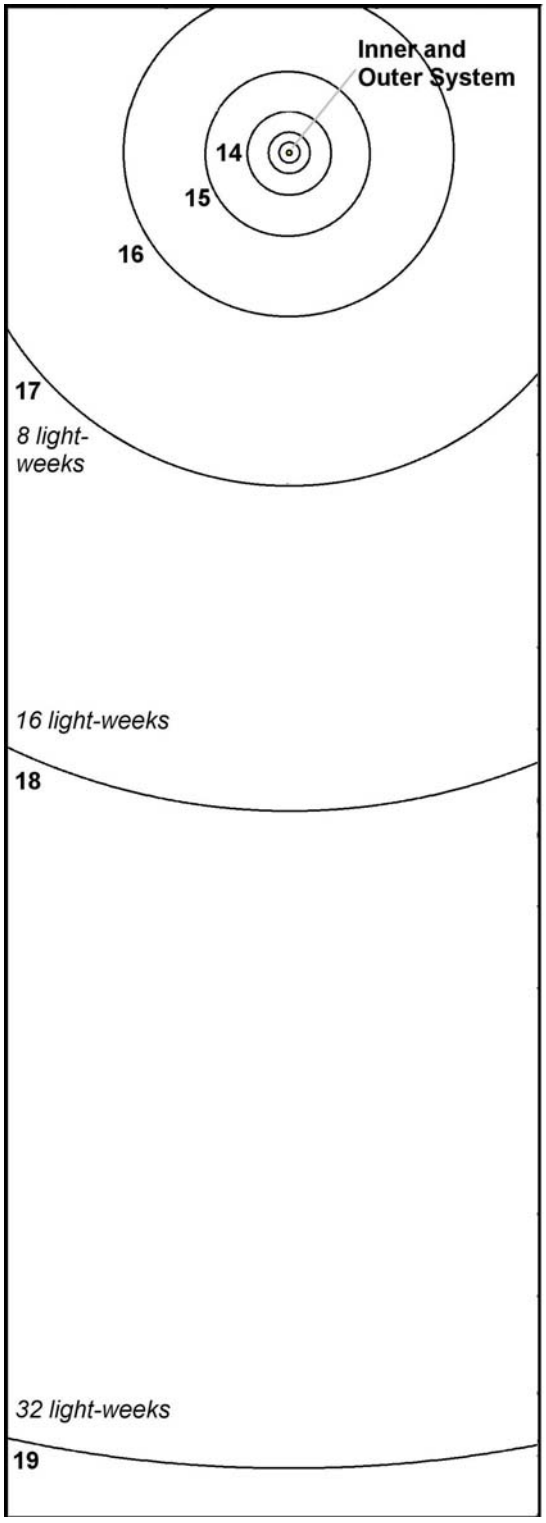
Remote System Fillform

Record the details of the Remote System on this FillForm. Mark worldnames on the map as necessary.

Fillform

Remote

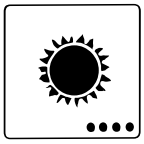
THE REMOTE SYSTEM



LOCATION AND DETAILS

Location (Sector and Hex)	
Mainworld Name	Star Name and Spectral

OCCUPIED ORBITS



Terrain

The details of locations on a world are revealed by its Terrain. Terrain provides specifics about locations: its wealth, its population, its productivity, even its dangers.

World mapping divides the surface of a world into a series of hexagons (hexes) which define location and help in computing movement. Worlds are mapped with coarse scale World Hexes grouped into triangles to form a hexagon based world map. Each of the World Hexes is further divided into Terrain hexes, which may be divided into Local hexes, which may be divided into Single hexes. Each of the hexes is further detailed by a Terrain Type.

Terrain Within Terrain Within Terrain. Terrain is mapped with a hierarchy of hexes. The result is larger hexes which may appear impassible, but when analyzes more specifically reveal potential travel routes.

For example, a World Hex identified as Mountain (and probably impassible) may prove to be composed of many Terrain hexes, some of which are passable. It is only when terrain is explored that characters can discover its true nature.

MOARN Map Only As Really Necessary. Detail should be produced only as needed. Part of the adventure is encountering unexpected terrain.

THE TERRAIN CHARTS

Terrain is described and explained in a series of charts:

Terrain Overview. Fifty-four terrain types are shown in overview on this chart. Each type is named and numbered for ease of reference.

The Heights. The Heights chart shows the various levels or altitudes in the atmosphere on mainworlds. It shows the atmosphere type at various altitudes, and provides direction on the effects of atmosphere (or lack of atmosphere) on characters. It shows the types of atmosphere in which Flyers may operate.

The Depths. The Depths chart shows the depths of oceans on mainworlds. It shows the effects of pressure on vehicles which venture into the depths.

Vehicle Speeds. The Vehicle Speeds chart shows Speed values for various types of vehicles and their corresponding speeds in kph.

The chart also shows the typical or expected maximum speed of various vehicles in specific types of terrain.

For example, the chart shows a Car cannot operate in Clear terrain (because a Car is built to operate on Road), but an OffRoad can (at Speed=4 = Vslow = 30 kph) with 0 Mods.

Terrain Charts 1 - 9. The Charts show and describe the specific types of terrain.

UNDERSTANDING TERRAIN

Terrain is the character or nature of world surfaces. It may reflect the topography of land, the types of vegetations or natural features of land, the improvements or infrastructure, or a combination of these elements.

Terrain may be as simple as Clear: flat, unimproved land with no specific restrictions on travel or access. Terrain may be as complex as Domed City in Twilight Zone.

Mapped In Hexes. The Traveller Mapping System defines a hierarchy of mapping hexes: the 1000 km World Hex; the 100 km Terrain Hex; the 10 km Local Hex; and the 1 km Single Hex. Larger hexes have more general terrain; smaller hexes have more specific Terrain.

Identified by Terrain Types. Terrain is identified by Type or Name. Each Terrain Type describes specific features which restrict or enhance travel, and which identify interesting features.

WHAT TERRAIN DOES

Terrain has three important effects:

It Provides Character. Terrain provides character and interest to world surfaces. Terrain defines the details of locations and provides insights into potential benefits or consequences of exploring those locations.

Its Shows (Potential) Value and Resources. Terrain establishes the potential for finding value and important resources in specific locations. Certainly Wooded terrain can provide lumber; Baked Lands can probably provide pools of liquid base metal; Frozen Lands may provide solidified gases.

But Terrain also directs or narrows searches. Characters will probably not search Swamps for starship repair parts; they probably won't hunt tigers in Cities (but!). Terrain tells reasonable people what to expect and not to expect in specific locations.

Movement and Impediments. Terrain constrains movement by individuals and by vehicles. It clearly establishes the expected speeds for specific vehicles and it directs of channels movement to specific routes.

VEHICLE OPERATIONS

Vehicles are classified by the territory they cover.

Local. The vehicle is designed for travel on a daily basis in and around a specific location and within a Terrain Hex (an area 100 km in diameter). A car used for city driving or a delivery truck are Local. Such vehicles occasionally venture into adjacent Terrain Hexes.

Regional. The vehicle is designed for travel in several World Hexes (each about 1000 km in diameter). Many Cargo Trucks or Truck Trains are Regional. Such vehicles occasionally venture into adjacent World Hexes.

Continental. The vehicle is designed for travel within a World Triangle (a cluster of 3 to 28 World Hexes).

World. The vehicle is designed to travel anywhere on the World.

A territory classification assumes the vehicle will venture occasionally into neighboring territories. For example, a Regional vehicle will sometimes visit adjacent regions.

Vehicle Speeds. The Vehicle Speeds Chart details the expected travel speeds for vehicles based on Terrain.

THE TERRAIN TYPES

The 36 basic Terrain types address most situations to be encountered on world surfaces. The 18 additional Terrain types cover some special situations.

11. Clear. Simple and relatively flat. Vegetation is slight and unobtrusive. Other names for Clear terrain: Plains, Prairie, or Steppe.

12. Clear- Wooded. Clear, but more than half covered with mega-flora*.

13. Wetland. Relatively flat, and at least half covered with Shallow water (0.5 meters deep). Wetland is a Marsh.

14. Wetland Wooded. Wetland more than half covered with mega-flora*.

15. Rough. Uneven, obstructed, and rocky. Some names for Rough terrain include: Badlands,

16. Rough Wooded. Rough more than half covered with mega-flora*.

21. Mountain. Dominated by steep slopes and rocky peaks or ridges.

22. Desert. Clear characterized by little vegetation, lack of water, and extreme temperature.

23. Chasm. Deep gorge well below typical land or surface levels.

24. Cropland. Clear characterized by extensive and intensive agricultural uses. Cropland is Clear terrain with an overlay of Roads.

25. Rural. Clear which has been settled. Rural is an inferior or less productive form of Cropland. Rural is Clear terrain with an overlay of Roads.

26. Ruins. Includes sophont-constructed, now abandoned, buildings or installations.

31. Ocean. Saltwater ocean fed by continental drainage.

32. Islands. Includes a small group of islands in the Ocean.

33. Shore. The boundary between Continent and Ocean.

34. River. A channel of flowing water large enough to pose a barrier to travel.

35. Lake. An isolated body of fresh water that occupies more than half a hex. Ground transportation bypasses lakes rather than crossing them.

36. Ice Cap. A covering of frozen water near the North or South Pole.

41. Baked Lands. Lands under intense stellar heating.

42. Twilight Zone. Hospitable territory between the hot and cold hemispheres of Twilight Zone planets.

43. Frozen Lands. In constant shadow and extremely cold.

44. Ice Field. The location is covered with frozen Ocean.

45. Precipice. An extreme change of land elevation which is an absolute barrier to ground vehicle travel.

46. Exotic. Abnormal, unusual, unexpected, or inexplicable elements (geysers, volcanic events), meteorologicals (fogs, hazes, constant storms), aesthetics (beautiful landscapes, stunning atmospheric displays), or other.

51. City. A high population community with associated governmental, cultural, educational, commercial, and manufacturing facilities. For Transportation, treat City as Highway.

52. Domed. A City with associated environmental protections against Vacuum, Tainted Atmosphere, or Weather. For Transportation, treat Domed as Road.

53. Arcology. A complex of high population density hyperstructures. An Arcology is a self-sufficient isolated community with only limited exterior contacts.

54. Suburban. A moderate population community near and associated with a City.

55. Town. A low population community providing governmental, cultural, commercial, and educational support for the area.

56. Starport (or Spaceport). A landing ground for starships and interaction with off world enterprises.

61. Highway. A high quality transportation network component supporting wheeled vehicles.

62. Road. A local transport network supporting wheeled road vehicles.

63. Trail. A rudimentary, unpaved path for persons and Vlite vehicles.

64. Air Corridor. A path and assigned altitude for Flyers and under computerized air traffic control.

65. Grid. A surface Highway under centralized computer traffic control for safety and efficiency. Any surface vehicle with Grid Controls can use log into the Grid and use the roadways.

66. High Speed. A high-speed, high-volume passenger and cargo network using its own dedicated vehicles on rails or proprietary roadbeds.

ADDITIONAL TERRAIN TYPES

The additional Terrain types address special or less frequent situations.

71. Ocean Depths. A section of Ocean significantly deeper than normal.

72. Abyss. A section of Ocean (on an Ocean World) significantly deeper than normal.

73. Caverns. Surface terrain is underlain by extensive caves, tunnels, or other natural underground locations.

74. Crater. Dominated by a large impact crater.

75. Wasteland. Contaminated by natural or sophont processes, which may be chemical, biological, radiation, or other processes.

76. Penal Colony. Contains a prison or prison camp.

81. Volcanic. Experiences significant geothermal or volcanic activity.

82. Noble Estate. Contains the private territory of a noble.

83. Reserve. Set aside as a protected area.

84. Mines. Extensively mined for natural resources.

85. Resources. The location is the source of extensive and rich natural resources.

86. Resources Oil. The location is the source of extensive and rich natural petrochemical resources.

91. Vlite Airport. A rudimentary landing ground for Flyers suitable for Vlite Winged craft.

92. Lite Airport. A landing ground for Flyers suitable for Lite and Vlite Winged craft.

93. Airport. A landing ground for Flyers suitable for Medium and smaller Winged Flyers. Runways (usually more than one) are about 3,000 meters long.

94. Heavy Airport. A landing ground for Flyers suitable for Heavy and smaller Winged Flyers.

95. Vheavy Airport. A landing ground suitable for all winged Flyers.

96. AirPad. A landing ground for vertical landing and takeoff Flyers.

96. Open Field. Clear terrain equivalent to 91, Vlite Airport.

97. Road. Road terrain equivalent to 92, Lite Airport.

98. Highway. Highway terrain equivalent to 93, Medium Airport.

***Mega-Flora.** Plant life or vegetation larger in size than persons is Mega-Flora (a typical mega-flora is a tree). Mega-flora is a barrier to most vehicles.

HEIGHTS AND DEPTHS

Altitude in the atmosphere and depth in water are types of Terrain. They are expressed in Levels.

Altitudes

Atmosphere Type determines the effects of atmosphere on travel (especially on Flyers).

The **Levels of the Atmosphere Chart** shows the various levels for various world atmosphere types.

The Surface level is the world surface. Levels above the surface correspond to the standard ranges.

Upper (Range=7) is further divided into several sublevels. Objects at a sublevel are treated for most purposes as at the level; the sublevels merely allow differentiation for various flyers and for the dissipation of the atmosphere.

NOP. The conventional term for flying close to the surface of a world (primarily to avoid detection) is called Nap of the Planet. By ancient convention, on Terra (and only on Terra) this level is called NOE.

Depths

Water on a world has depth measured in levels. Submersibles, some forms of Armor, and some spacecraft can submerge below the surface of oceans, and may be able to venture deep into the depths.

Chart 14 Depths details the levels of Depth.

The **Depths of the Oceans Table** shows the various depths and when they typically are present.

Pressure. Objects at any appreciable depth are subject to Pressure as shown. Pressure shown in units roughly equal to Bars (or Atmospheres).

Pressure inflicts damage to objects in D. Pressure-1 includes 1D hits per Minute. A submarine at resting on the Continental Shelf is subject to Pressure-15 every minute.

INSIGHTS INTO TERRAIN

Various terrain types are related.

Desert and **Baked Lands** are related.

Desert is dry territory, usually hot. **Baked Lands** are territory under constant stellar (solar) heating, usually on Twilight Zone worlds. **Desert** only occurs on worlds with atmospheres. **Baked Lands** may be vacuum, or may be on a world with atmosphere.

Ice Cap, **Ice Field**, and **Frozen Lands** are related.

Ice Cap is a mass of ice (or other frozen liquids and gases) accumulated toward the poles of a world; it may overlie Land or Ocean. **Ice Field** is a region of frozen Ocean; it overlies only Ocean; liquid Ocean may be present under the Ice Field. **Frozen Lands** is a region of very cold Land; it overlies only Land. The Ocean or Land underneath may have other terrain features present.

Chasm and **Precipice** are related.

Precipice is a sheer cliff or rock wall which cannot be crossed by world surface travel. **Chasm** is a canyon or deep crevasse (best thought of as paired Precipices). **Chasm** produces the only hospitable or habitable locations on Atmosphere= F Thin Low worlds.

City, Domed, Arcology, Suburb, Town, Cropland, and **Rural** are related.

City is a dense highly populated location with its associated infrastructure to support the demands of the population: markets; roads and bridges; entertainment; services. **Domed** is a **City** in an inhospitable location requiring protection from Atmosphere (or other Threats). **Arcology** is a hyper dense population center which avoids unnecessary interactions with other locations; it strives to be self-supplying for its energy, food, and other product needs. **Suburb** is medium-density population center near a **City;** it appears only near or adjacent to a **City. Town** is a low-density population center isolated from other population centers. **Cropland** is agricultural land with significant population involved in its support and usually dispersed with the territory. **Rural** is similar to **Cropland** but not as productive. All populated terrain types include Roads, and some include Highways.

Terrain Overview

The various terrain types are shown here for reference.


Clear 11


Marsh 12


Rough 13

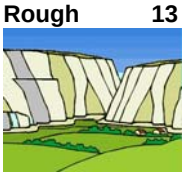

Clear Wood 14


Swamp 15

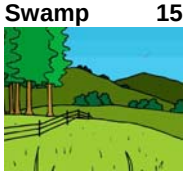

Rough Wood16

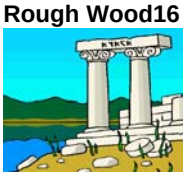

Mountain 21


Desert 22


Chasm 23


Cropland 24

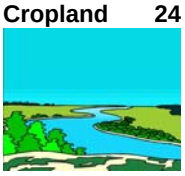

Rural 25


Ruins 26


Ocean 31


Islands 32


Shore 33

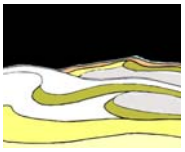

River 34


Lake 35


Ice Cap 36

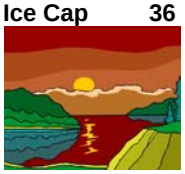

Baked Lands41


Twilight Zone42


Frozen Land 43


Ice Field 44


Precipice 45


Exotic 46


City 51


Dome 52


Arcology 53


Suburb 54


Town 55


Starport 56

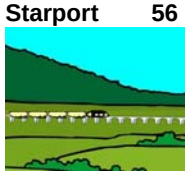

Highway 61


Road 62

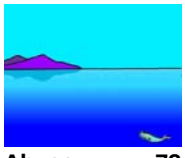

Trail 63


Air Corridor 64

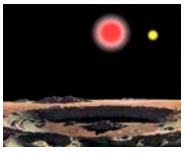

Grid 65


High Speed 66


Ocean Depth711

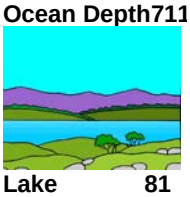

Abyss 72

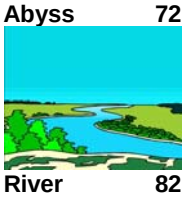

Caverns 73

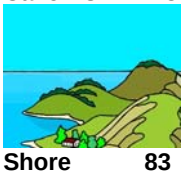

Crater 74


Wasteland 75


Penal 76

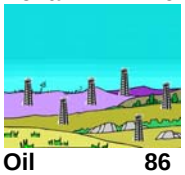

Lake 81


River 82


Shore 83


Mines 84


Resources 85


Oil 86

Airpad 91

Vlite Airstrip 92

Lite Airstrip 93

Airport Med 94

Airport Hvy 95

Airport Vhvy96

Levels of the Atmospheres

Ellipsoid

Altitude	R=	Level	0 Vacc	2 Vthin	4 Thin	6 Standard	8 Dense	A Exotic	B Corrosive	C Insidious	D Dense High	E1 Polar	E2 Arctic	E3 Tropical	E4 Equatorial	F Thin Low	Comments
250,000 km	11	Satellite	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Luna= 384,000 km
50,000 km	10	Geo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	For Terra= 36,000 km
5,000 km	9	Far Orbit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MEO = Medium Earth Orbit
500 km	8	Orbit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	LEO = Low Earth Orbit
50 km	7	Upper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
30 km	6.8	Mid8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
20 km	6.6	Mid6	0	0	0	0	1	1	1	1	1	0	0	0	0	0	
12 km	6.4	Mid4	0	0	0	1	2	2	2	2	2	1	0	0	0	0	
8 km	6.2	Mid2	0	0	1	2	4	4	4	4	4	2	1	0	0	0	
5 km	6	Mid	0	1	2	4	4	4	4	4	4	4	2	1	0	1	
1000 m	5	Airspace5	0	1	2	4	6	6	6	6	6	4	4	2	0	2	
500 m	4	Airspace4	0	2	4	6	8	A	A	A	A	6	4	2	1	2	
150 m	3	Airspace3	0	2	4	6	8	A	A	A	A	6	4	2	1	2	
50 m	2	NOP	0	2	4	6	8	A	A	A	A	6	4	2	1	2	
5 m	1	Near Surface	0	2	4	6	8	A	A	A	A	6	4	2	1	2	Typical Grav Altitude
1.5 m	T		0	2	4	6	8	A	A	A	A	6	4	2	1	2	
0.5 m	R		0	2	4	6	8	A	A	A	A	6	4	2	1	2	Typical Lifter Altitude
Surface	**0**	**Surface**	**0**	**2**	**4**	**6**	**8**	**A**	**A**	**A**	**A**	**6**	**4**	**2**	**1**	**2**	
500 m	-4	Chasm Rim	0	2	4	6	8	A	A	A	A	6	4	2	1	2	
1000 m	-5	Chasm Wall	1	4	6	8	A	A	A	A	A	8	6	4	2	4	
5 km	-6	Chasm Floor	2	4	6	8	A	A	A	A	A	8	6	4	2	4	

On This Table: 2= Very Thin (includes Atm-3). 4= Thin (includes Atm-5). 6= Standard (=Earth. =Terra) (includes Atm-7). 8= Dense (includes Atm-9). A= Very Dense (includes A=Exotic, B=Corrosive, and C=Insidious).

THE ATMOSPHERE TYPES

	Type	Descriptor	Tainted?	Human Effects	
0	0	Vacuum		Suff-3	
	1	Trace		Suff-3	
2	2	Very Thin	Tainted	Suff-2. Poison-1.	
	3	Very Thin		Suff-2	
4	4	Thin	Tainted	Suff-1. Poison-1.	
	5	Thin		Suff-1	
6	6	Standard			
	7	Standard	Tainted	Poison-1	
8	8	Dense			
	9	Dense	Tainted	Poison-1	
A	A	Exotic		Poison-1.	
	B	Corrosive		Corrode-1. Poison-1	
	C	Insidious		Corrode-2. Poison-1	
*	D	Dense-High			
*	E	Ellipsoid		Polar	E1
				Arctic	E2
				Tropic	E3
				Equatorial	E4
*	F	Thin-Low			

* Governing pressure determined from the chart.

FLYERS AND ATMOSPHERES

Type	Prohibited	Mishap In	Operates In
Wing	0	2	2-4-6-8-A
Rotor	0-2	4	4-6-8-A
Flapper	0-2-4	6	6-8-A
LTA	0-2	4	4-6-8-A

Mishap: Flyer operating in Mishap Atmosphere Check Quality twice during the flight.

Human Atmosphere Effects

Effects are imposed per minute.

Non-Human Atmosphere Effects

Sophont breathes native Air-N.

Lower Atmosphere levels produce Suff= (Native Air minus Local Air) / 2 (round fractions up). Taint (other than in Native Atmosphere) inflicts Poison-1.

For example, a sophont who normally breathes Air-9 and is on a world with Air-6 can expect (9-6 = 3 / 2 = 1.5 =) Suff-1 breathing the local atmosphere. He probably needs a Breather-5 (to increase Air-6 to Air-8).

The Depths of the Oceans

Altitude	R=	Level	Pond	Stream	Lake	River	Large Lake	Harbor	Bay	Sea	Ocean	World Ocean		Pressure	Comments
50 m	2	Tsunami	-	-	-	-	-	-	-	-	□	□			
5 m	1	Vbig Waves	-	-	-	-	-	-	-	-	□	□			
1.5 m		Big Waves	-	-	-	-	□	-	-	□	□	□			
.5 m		Waves	□	□	□	□	□	□	□	□	□	□			
Surface	0	Surface	□	□	□	□	□	□	□	□	□	□			Lake, Sea, Ocean Surface
.5 m	R	Wading	□	□	□	□	□	□	□	□	□	□			
1.5 m	T	Fording	□	□	□	□	□	□	□	□	□	□			
5 m	1	Pond	□	□	□	□	□	□	□	□	□	□		1	Pond
50 m	2	Thermocline	-	□	□	□	□	□	□	□	□	□		5	Pond Bottom
150 m	3	Shelf	-	-	□	□	□	□	□	□	□	□		15	Continental Shelf
500 m	4	Lake Bottom	-	-	□	□	□	□	□	□	□	□		50	Lake Bottom
1,000 m	5	Deep Lake	-	-		-	□	□	-	-	□	□		100	Deep Lake
5,000 m	6	Sea Bottom	-	-	-	-	-	-	-	-	□	□		500	Ocean Bottom
50 km	7	Deep Ocean	-	-	-	-	-	-	-	-	-	□		5,000	Maximum depth non-Ocean World
500 km	8	Abyss	-	-	-	-	-	-	-	-	-	□		50,000	Ocean World Abyss
5,000 km	9		-	-	-	-	-	-	-	-	-	□		500,000	Probably never encountered.

□= Accessible with proper equipment. – (shaded) not possible.
Pressure in Bar (= one Atmosphere). Pressure-1 inflicts 1D hits per minute.

DAMAGE

Any object under water is subject to Pressure as shown. Pressure-1 inflicts 1D hits per minute on Armor. If Armor is penetrated, Sealed is also penetrated.

Inverse Damage. A native from a specified depth requires protected enclosures equal to the difference in Pressure when venturing out of its native level.

Speeds

Typical vehicle speeds are shown.

Speed

BASE VEHICLE SPEEDS

		Speed	kph	Air	Water	Land	Land	Gravitics
1	6	Creep	5			Person	Mole	
2	- 5	Crawl	10			Legged		
3	- 4	Xslow	20			OffRoad		Lifters
4	- 3	Vslow	30		Boat	ATV	Tracked	
5	- 2	Slow	50	LTA	Ship	MTV	Wheeled	G-Drive; M-Drive
6	- 1	Standard	100	Flapper	Sub	STV	Air Cushion	
7	0	Cruise	300	Rotor			Road	M-Drive
8	+1	Fast	500	Wing				
9	+2	Vfast	700					
10	+3	Sonic	1000					Speed of Sound In Air
11	+4	Ssonic	2000					
12	+5	Hsonic	3000					
13	+6	Xhsonic	5000					

Speed is the typical speed for the vehicle. An operator may push the vehicle to Speed +1 subject to mishap.

Vehicles may not exceed Speed-10 in atmosphere unless designed for greater than Speed-10.

SPEED AND TERRAIN

Terrain No	Terrain	Person	Car	Truck	OffRoad	ACV*	Wheeled	Tracked	Lift	G-Drive M-Drive	Mole	Legged
Speed=		**1**	**7**	**7**	**4**	**6**	**5**	**4**	**3**	**5**	**1**	**2**
11	Clear		no	no	0	0	0	0			0	0
12	Clear Wooded		no	no	-1	no	-1	-1			0	0
13	Wetland		no	no	no	-1	-2	-1			0	0
14	Wetland Wooded		no	no	no	no	no	-2			0	0
15	Rough		no	no	-1	no	-3	-1			0	0
16	Rough Wooded		no	no	no	no	no	-2			0	0
21	Baked Lands		no	no	-1	0	0	0			0	0
22	Twilight Zone		no	no	0	0	0	0			0	0
23	Frozen Lands		no	no	-1	0	0	0			0	0
24	56 Icefield, Ice Cap		no	no	-1	0	0	0			0	0
25	Precipice		no	no	no	no	no	no			-1	0
26	Exotic		no	no	0	0	0	0			0	0
31	Mountain		no	no	no	no	no	-2			-1	0
32	Desert		no	no	0		0	0			0	0
33	Chasm		no	no	no	no	no	no			-1	0
34	35 Cropland, Rural		Road	Road	Road	0	1	1			0	0
41	City		Hwy	Hwy	Hwy	No	1	1			0	0
42	43 Domed, Arcology		Road	Road	Road	No	1	1			0	0
44	Suburban		Hwy	Hwy	Hwy	No	1	1			0	0
45	Town		Road	Road	Road	No	1	1			0	0
46	Starport		Road	Road	Road	Road	1	1			0	0
51	Ocean	No	no	no	no	0	no	No			0	no
52	Islands	No	no	no	0	0	No	-1			0	no
53	Shore	No	no	no	no	0	No	-1			0	no
54	River		no	no	no	0	-2	-1			0	no
55	Lake		no	no	no	0	-3	-3			0	no
61	Highway		Hwy	Hwy	Hwy	Hwy	Hwy	Hwy			0	No
62	Road		Road	Road	Road	Road	Road	Road			0	No
63	Trail		Vlite	Vlite	Vlite	Vlite	Vlite	Vlite			0	No
64	Air Corridor		no	no	no	no	no	no			no	No
65	Grid	No	0	0	0	0	0	0			0	0
66	High Speed		no	no	no	no	no	no			no	No

Terrain-1

Terrain Group 1 is the basic set of terrain types encountered on hospitable world surfaces.

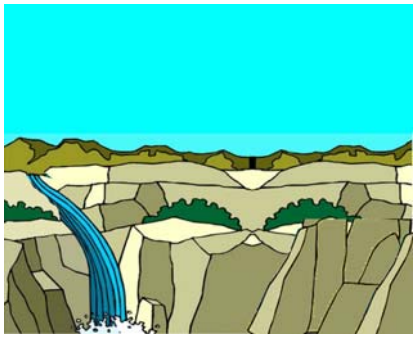
Terrain-1

Clear 11

The way ahead is Clear: flat or rolling land with a minimum of obstructions. There may be minor barriers from surface rocks, gullies, or water channels. There may be occasional vegetation.

Wetland 13

The way ahead is Wetland: marshlands more than half covered with shallow water (generally knee to waist deep). There is no clear or continuous land path through the area. There may be minor barriers (islands, hills, or rocks). There may be occasional vegetation.



Rough 15

The way ahead is Rough: uneven, obstructed, and rocky land. Progress is indirect and time-consuming. There are major obstructions frequently encountered. There may be occasional vegetation.

Clear, Wooded 12

The way ahead is Clear but overlaid with megaflora (forests; large plant growth) for the majority of the area. Trees or other large vegetation are irregularly spaced no more than 3 meters apart, and often much closer, There are substantial barriers to surface vehicles.

Wetland, Wooded 14

The way ahead is Wetland: swamp overlaid with megaflora (forests; large plant growth) for the majority of the area. Trees or other large vegetation is irregularly spaced no more than 3 meters apart, and often closer. There are substantial barriers to surface vehicles.

Rough, Wooded 16

The way ahead is Rough overlaid with megaflora (forests; large plant growth) for the majority of the area. Trees or other large vegetation is irregularly spaced no more than 3 meters apart, and often closer. There are substantial barriers to surface vehicles.

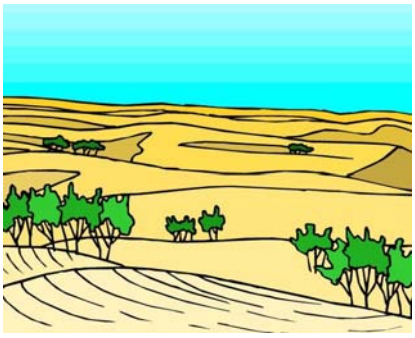
Terrain-2

Terrain Group 2 is a set of additional or less common terrain types encountered on hospitable world surfaces.

Terrain-2

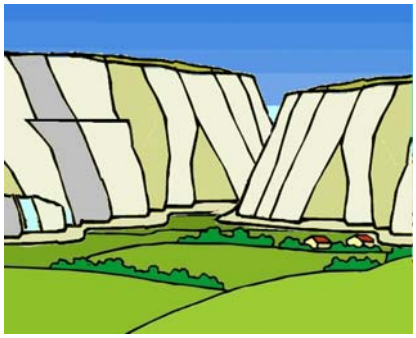
Mountain 21

The way ahead is Mountainous: steep rocky peaks or ridges presenting substantial barriers to travel. Surface progress is slow and severely restricted. There may be occasional vegetation.



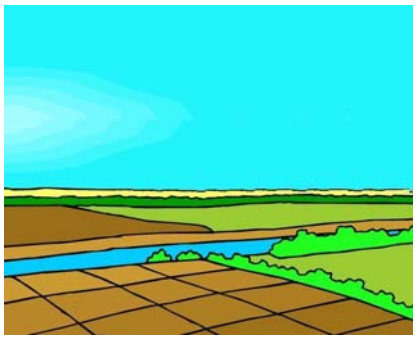
Desert 22

The way ahead is Desert: flat or rolling, often uneven or sandy. The terrain is dry with wide swings in temperature.



Chasm 23

The way ahead is a Chasm: deep valley, canyon, or gorge substantially below the typical land levels. Progress along the Chasm is easy; climbing the Chasm walls is formidable.



Cropland 24

The way ahead is Cropland: extensive, cultivated agricultural land dedicated to the production of crops.

Transport Net: Treat as Road.

Rural 25

The way ahead is Rural: partially or sparsely settled terrain nevertheless with basic civilized amenities and infrastructure.

Transport Net: Treat as Road.

Ruins 26

The way ahead is Ruins: sophont-constructed buildings or installations which have been abandoned and have fallen into disrepair.

Ruins may be found anywhere on any world: they range from simple abandoned buildings to ruined cities from long-lost civilizations.

Terrain-3

Terrain Group 3 is the basic set of water-related terrain types encountered on hospitable world surfaces.

Terrain-3

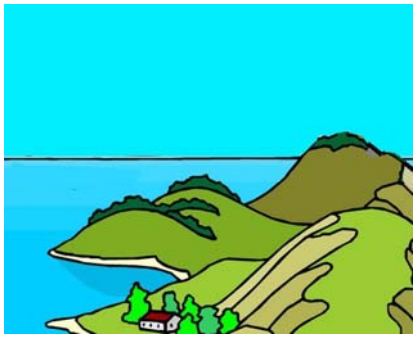
River 34

The way ahead is a River: flowing water large enough to pose a barrier to surface vehicles.

River may occur in any territory. Its flow connects to Lake of Ocean.

Lake 35

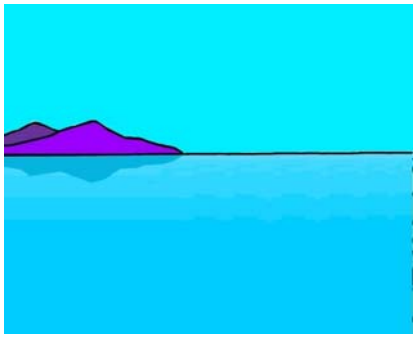
The way ahead is a Lake: a body of water covering most of a Terrain hex.



Shore 33

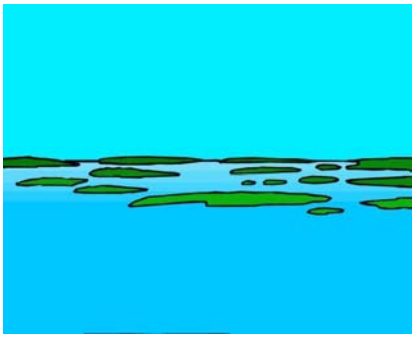
The way ahead is Shore: the boundary between land and ocean. Shore may include other terrain types as well.

The Water portion of the hex is Continental Shelf.



Ocean 31

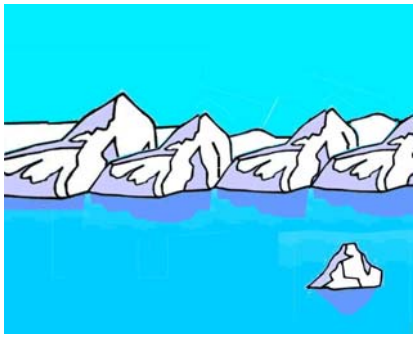
The way ahead is Ocean: a large body of saltwater fed by drainage from continents.



Islands 32

The way ahead is Islands: small bits of land in an Ocean.

Islands do not have Continental Shelves.



Icecap 36

The way ahead is Icecap: frozen water (or other) in the coldest regions of the world.

Terrain-4

Terrain Group 4 is the basic set of terrain types encountered on inhospitable world surfaces.

Terrain-4

Baked Lands 41

The way ahead is Baked Lands: territory under constant or intense stellar heating. The territory is reasonably flat and easily travelled. There are only occasional and minor barriers.

Twilight Zone 42

The way ahead is Twilight Zone: lands midway between the Baked Lands and the Frozen Lands of worlds locked to their star.

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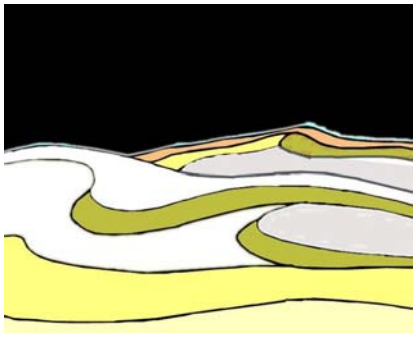
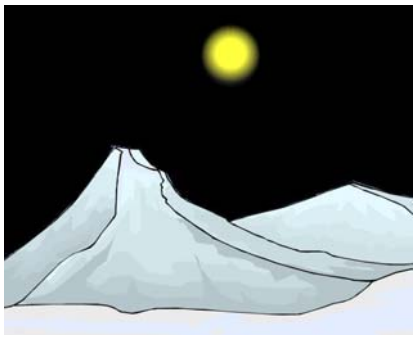


Frozen Lands 43

The way ahead is Frozen Lands: lands in constant shadow on planets locked to their star.

Or
Lands on worlds far enough from their primary star that they are forever frozen.

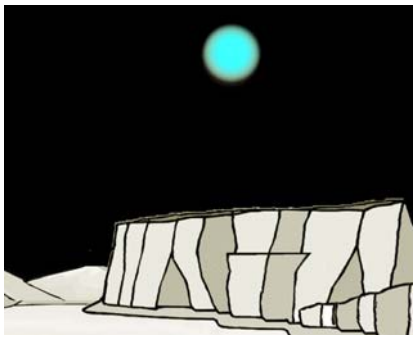


Ice Fields 44

The way ahead is Icefield terrain: vast expanses of frozen water, gases, or other liquids.

Exotic 46

The way ahead is Exotic terrain: abnormal, unusual, or inexplicable territory which provides unexpected features.



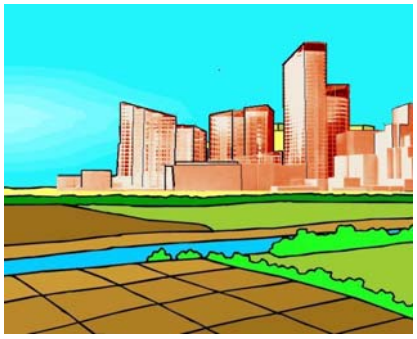
Precipice 45

The way ahead is a Precipice: an extreme change in land elevation which is an absolute barrier to surface vehicles.

Terrain-5

Terrain Group 5 is the basic set of terrain types associated with population centers.

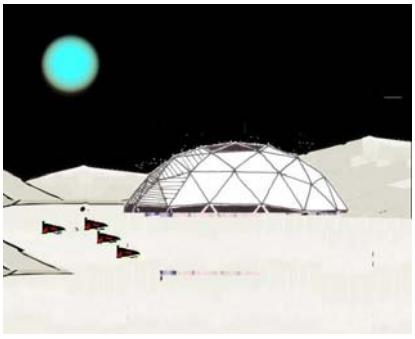
Terrain-5



City 51

The way ahead is City: a major population center with governmental, cultural, educational, and commercial facilities.

Transport Net: Treat as Highway.



Domed City 52

The way ahead is Domed City: a major population center with governmental, cultural, educational, and commercial facilities. It includes protections against environmental conditions.

Transport Net: Treat as Road.

Arcology 53

The way ahead is Arcology: a complex of large high population density hyperstructures. Arcologies are self-sufficient isolated communities with only limited exterior contacts.

Transport Net: Treat as Road.

Suburb 54

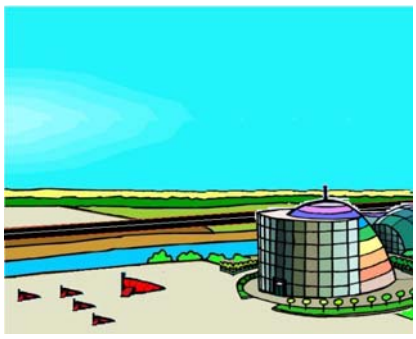
The way ahead is Suburb: moderate population regions on the edges of City terrain.

Transport Net: Treat as Highway.

Town 55

The way ahead is Town: low population regions providing government, cultural, commercial, and educational support for the region.

Transport Net: Treat as Road.



Starport 56

Starport is an established landing ground for starships and spacecraft.

Transport Net: Treat as Road.

Terrain-6

Terrain Group 6 is the set of terrain types associated with the transportation net.

Terrain-6

Highway 61

The way ahead is Highway: high quality Transport network intended for wheeled road vehicles.

Transport Net: Highway.

Road 62

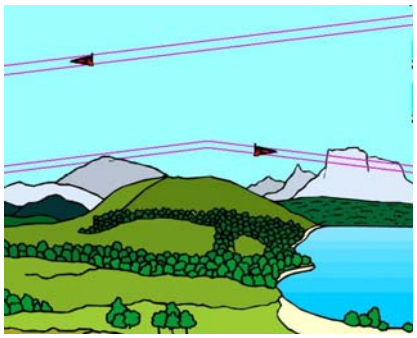
The way ahead is Road: moderate quality Transport network intended for wheeled road vehicles.

Transport Net: Road.

Trail 63

The way ahead is Trail: low quality Transport network intended for vlite vehicles.

Transport Net: Trail.



Air Corridor 64

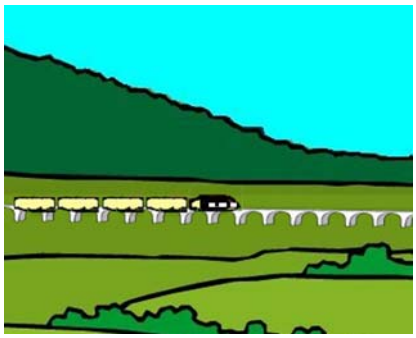
Air Corridor is a path and altitude for Flyers. It is under computer air traffic control.

Transport Net: Air Corridor.

Grid 65

The Grid is controlled Highway providing automated vehicle direction for safety and efficiency.

Transport Net: Treat as Highway.



HighSpeed 66

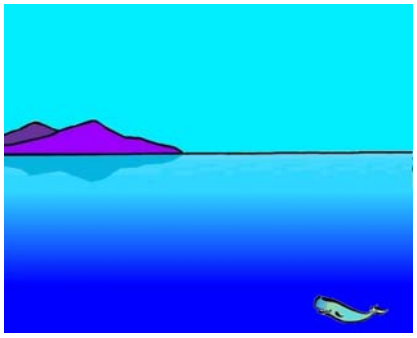
High Speed dedicated high speed, high volume passenger and cargo movers.

Transport Net: High Speed.
Transport Net: Treat as Trail.

Terrain-7

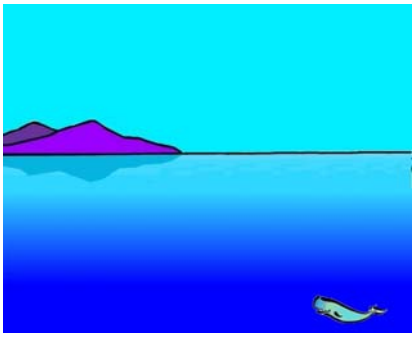
Terrain Group 7 is the supplementary set of terrain types associated with strange or esoteric locations.

Terrain-7



Ocean Depth 71

The way ahead is portion of the Ocean which is significantly deeper than normal.



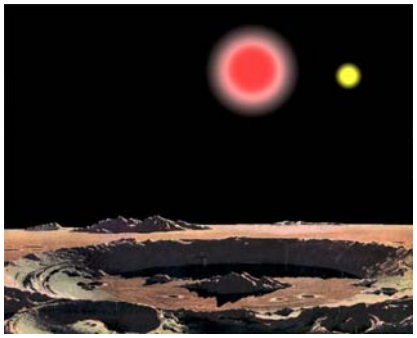
Abyss 72

The way ahead is portion of the Ocean (specifically on an Ocean World) which is significantly deeper than normal (and deeper than Ocean Depth).

Caverns 73

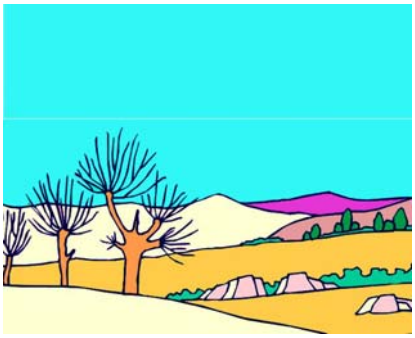
The way ahead is underlain by extensive caves, tunnels, or other natural underground locations.

Caverns are overlaid (underlain?) on other terrain.



Crater 74

The way ahead is Crater: a significant impact crater which creates substantial barriers to movement.



Wasteland 75

The way ahead is Wasteland: lands contaminated by natural or sophont processes. Contamination may be chemical, biological, radiation, or other processes.

Wasteland is overlaid on other terrain.

Penal Colony 76

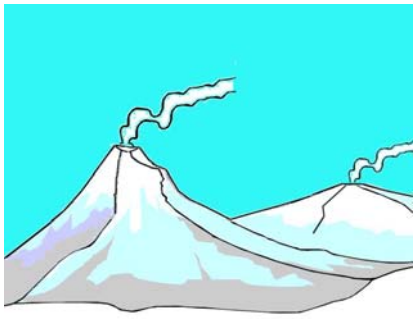
The way ahead is Penal Colony: a community of convicted criminals (or political prisoners) transported here from another world.

Penal Colony is overlaid on other terrain.

Terrain-8

Terrain Group 8 is a supplementary set of terrain types associated with resources.

Terrain-8



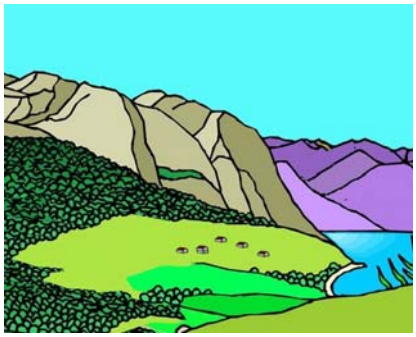
Volcanic 81

The way ahead is Volcanic: molten interior rock emerging to the surface. The territory is similar to Mountain. Surface progress is slow and severely restricted. There may be occasional vegetation.

Noble Estate 82

The way ahead is Noble Estate: the private lands of a wealthy or powerful government, business, or military leader.

The estate is overlaid on other terrain, which influences surface progress. In addition, local security forces may obstruct or impede movement.



Reserve 83

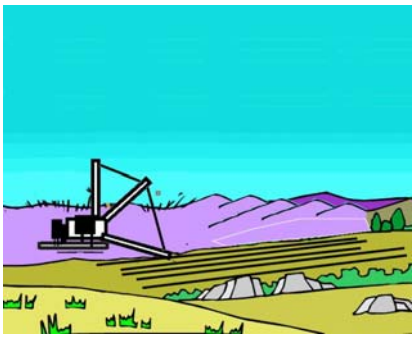
The way ahead is Reserve: lands set aside from exploitation or settlement. The territory is subject to entry and interaction restrictions in order to protect it from exploitation or interference.

The Reserve is overlaid on other terrain, which influences surface progress.

Mines 84

The way ahead is a Resource being exploited to produce ores or raw materials.

The Mine is overlaid on other terrain.



Resources 85

The way ahead is a significant Resource which is part of the natural wealth of the world.

The Resource is overlaid on other terrain.

Resources Oil 86

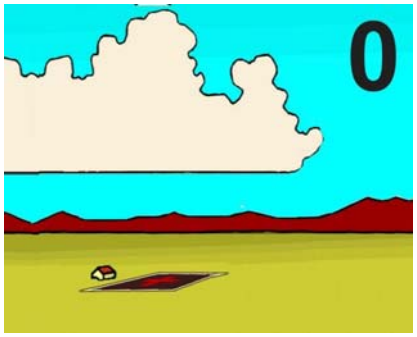
The way ahead is a significant Resource (consisting of natural petrochemicals or their analogs) which is part of the natural wealth of the world.

The Resource is overlaid on other terrain.

Terrain-9

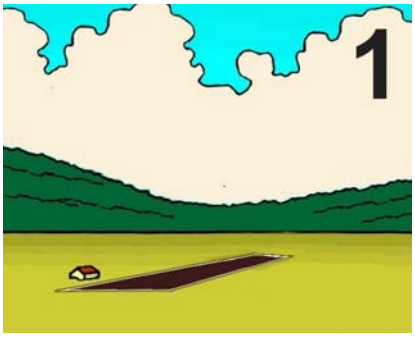
Terrain Group 9 is the set of terrain types associated with Flyer landing grounds.

Terrain-9



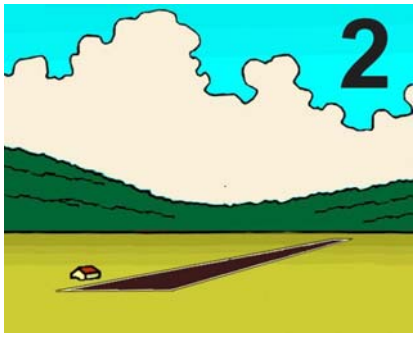
Airpad **96**

A landing ground for vertical landing and takeoff Flyers.



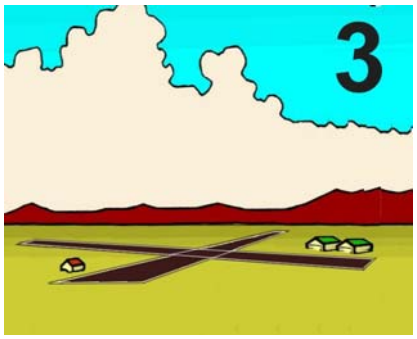
Airstrip Vlite **91**

A rudimentary landing ground for Flyers suitable for Vlite Winged craft.



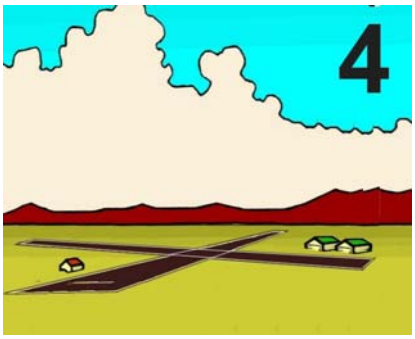
Airstrip Lite **92**

A landing ground for Flyers suitable for Lite and Vlite Winged craft.



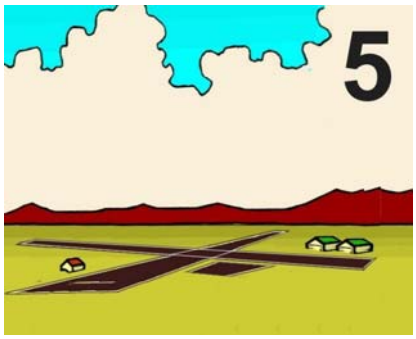
Airport **93**

A landing ground for Flyers suitable for Medium and smaller Winged Flyers. The runways (usually more than one) are about 3,000 meters long.



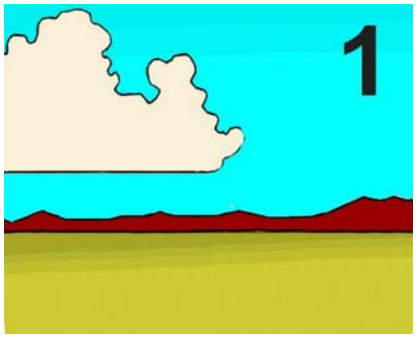
Airport Heavy **94**

A landing ground for Flyers suitable for Heavy and smaller Winged Flyers.



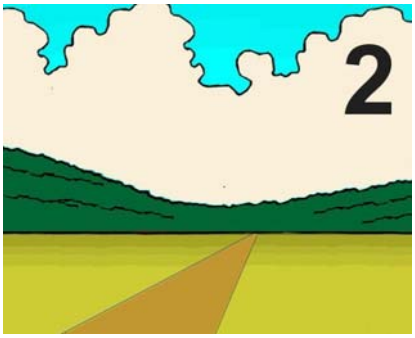
Airport Vheavy **95**

A landing ground suitable for all winged Flyers.



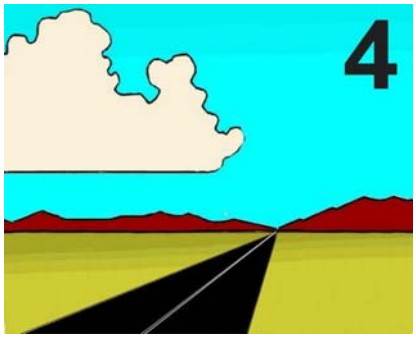
Open Field **97**

A portion of other terrain suitable for landing by Vlite Winged craft.



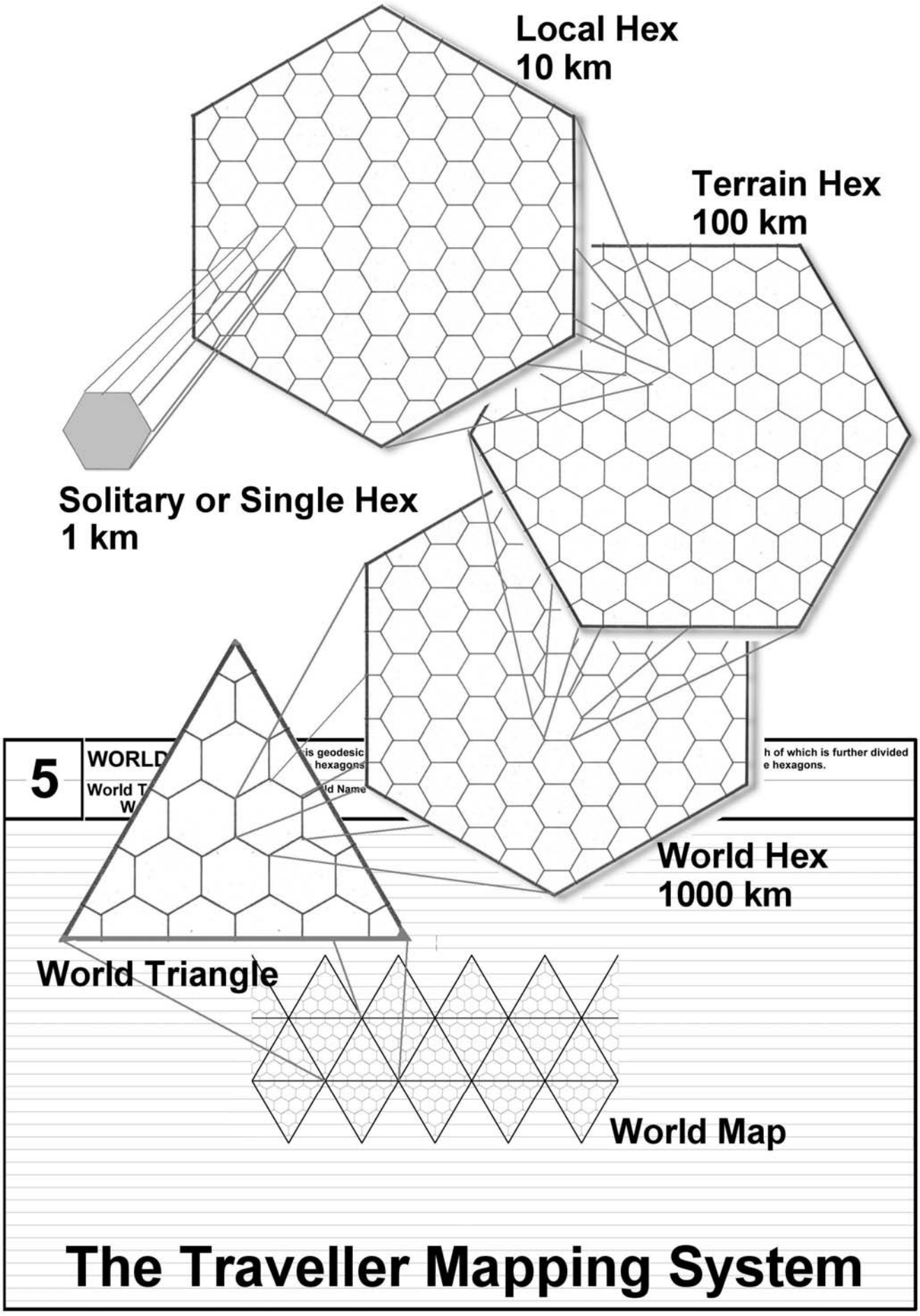
Road **98**

A portion of road suitable for landing by Lite and Vlite Winged craft.



Highway **99**

A portion of highway suitable for landing by Medium and smaller Winged craft.


Local Hex
10 km
Terrain Hex
100 km
Solitary or Single Hex
1 km
5
WORLD
World T
W
is geodesic
hexagons
Id Name
h of which is further divided
e hexagons.
World Hex
1000 km
World Triangle
World Map
The Traveller Mapping System

Mapping Worlds

The surface features of worlds are the key to exploring and exploiting worlds. Terrain details the character of large and small locations, controls or bars movement by vehicles, and records positions of objects and characters.

World mapping divides the surface of a world into a series of hexagons (hexes) which define location and help in computing movement. Worlds are mapped with coarse scale World Hexes grouped into triangles to form a hexagon based world map. Each of the World Hexes is further divided into Terrain hexes.

THE TRAVELLER MAPPING SYSTEM

Worlds (planets or satellites) are mapped with a hierarchy of hexes which record location, terrain, and other details.

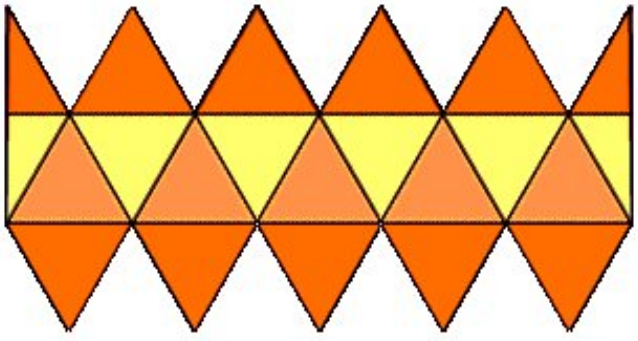
Hexagons. Mapping is based on six-sided hexagons. Hexagon cells for mapping have long been a foundation of wargaming. They allow more flexibility than square based mapping: distance can be counted more easily and more accurately, and more directions of movement are possible.

The System Hierarchy

The **Traveller Mapping System** (TMS) is a hierarchy of hexagon-based maps created to describe and detail worlds as the information is needed in the course of adventures. The TMS hierarchy consists of:

The World Map. The World Map is a flattened icosahedron (a twenty-sided regular polygon the same shape as a 20-sided die) to represent the spherical world surface.

The twenty triangles of the icosahedron are flattened into a map for ease of printing and reading.



On this map, the top is the North Pole (the bottom is the South Pole) and the left (West) side wraps to touch the right (East) side. The East and West edge triangles are divided to more easily fit on the page.

The World Triangle. Each of the triangles of the World Map is (roughly) a Continent or an Ocean.

The World Hex (1000 km). The surface of the world is divided into World Hexes of constant size: 1000 km in diameter. While all worlds have the same number of World Triangles (twenty), larger worlds have more World Hexes than smaller worlds.

The Terrain Hex (100 km). The World Hex is divided into 75 Terrain Hexes. Each is 100 km is diameter and allows recording or interacting with terrain in greater detail.

The Local Hex (10 km). The Terrain Hex is divided into 75 Local Hexes. Each is 10 km in diameter and allows very fine scale mapping of locations.

The Single Hex (1 km). The Local hex is divided into 75 Single Hexes, each 1 km in diameter. The Single Hex is the ultimate mapping hex.

Pents. Technically, the hexagons where five Triangles meet are pentagons (or pents). They are treated in most respects like World Hexes.

There are twenty Pents on a World Map.

Movement Using The Traveller Mapping System.

The TMS allows easy distance counting. All hex distances are multiples of 10 km. A route counted in World Hexes gives the distance in thousands of kilometers; a route counted in Terrain Hexes gives the distance in hundreds of kilometers.

Tracing Routes. Any number of routes can be traced from center-of-hex to center-of-hex.

Crossing Gaps. The gaps between World Triangles are zero-distance. A route can be traced across a gap to the other half of a hex with no additional distance cost.

TERRAIN

Terrain is the nature of individual surface features on a world. Terrain governs, enhances, or obstructs movement; it identifies important resources; it reflects points of interest or danger.

Terrain Types. A selection of 36 Terrain types details most surface feature situations to be encountered.

Terrain Symbols. The Terrain Symbol chart provides hand-drawing compatible map symbols for use with TMS.

Terrain Numbers. The 36 Terrain Types are also identified by numbers using only the digits 1 through 6. The available numbers 11 through 66 can be generated randomly (when needed) using two dice.

Terrain Effects. The specific effects of terrain are detailed in the Terrain chapter.

MAPPING WORLDS

Worlds are mapped using the principals and charts of the Traveller Mapping System.

The Three Mapping Principles

The **Traveller Mapping System** is based on three Principles.

- **Map Only As Really Necessary.**
- **Map At The Highest Possible Scale.**
- **Involve The Players.**

Map Only As Really Necessary. The charts allow random selection of hexes with a few die rolls. There is no need to create complete or comprehensive maps before they are needed.

Characters on a ship entering a system can consult a UWP and databases for a general idea about the local world. The UWP provides enough basic information for most purposes.

Map At The Highest Scale Possible. Because terrain can be created as needed, reference maps for players should enough to provide them information without needless detail. The twenty triangles of a World Map can give a basic idea of continents and oceans.

More detail and specific maps are called for only when the characters see a need.

Involve The Players. When map details are required, recruit the players to make die rolls which locate or identify terrain or details.

When a character says, “I want to see more near our destination,” he becomes more involved in the process. Ships scanners, world maps in Library Data, or conversations with non-player characters can provide the needed information. Once that process has been resolved, the referee provides a blank World Hex (or Terrain Hex, or Local Hex) map and the player, with guidance from the referee, creates and enters t

The Referee’s Responsibility

The referee can (and should) determine specific terrain details which are important to an adventure. He can plan and map the strategic base the enemy will defend, or note the details of the strange alien city at the edge of the remote system.

But, the other details: the other worlds in the system, the terrain near the starport, or strange mountain valleys along the way are all easily generated by involving the players as the information becomes necessary.

The Three Principles have benefits for the Referee. The burden of creating terrain is shared with the players, and when used properly transforms from a burden to an element of the adventure. Each new element of terrain involves the players and their imaginations; it is often the players who then say, “Let’s see what is past that hill.” Or “Why is that valley so long?” and those questions provide more support for an interesting adventure.

CREATING WORLD MAPS

The Mapping Charts detail the mapping process. The Charts include:

Chart 1. World Dimensions
Chart 2. The World Map (Example)
Chart 3. The World Triangles.
Chart 4. The World Hex.
Chart 5. The Terrain Hex.
Chart 6. The Local hex.
Chart 7. The Single Hex.
Chart 8. Terrain Types.
Chart 9. Terrain Symbols (by hand).
Chart 10. Randomly Selecting Places.
Chart 11. Creating World Maps.
Chart 12a. Populating World Hexes-1.
Chart 12b. Populating World Hexes-2.
Chart 13a. Populating Terrain Hexes-1.
Chart 13b. Populating Terrain Hexes-2.
Chart 14a. Populating Local Hexes-1.
Chart 14b. Populating Local Hexes-2.

Absolute Mapping

It is possible to begin with a blank map and follow the process to completely define every hex and all terrain for a world. The charts make this process possible. Chart 10 governs creating the World Map, and Charts 11a and 11b govern filling in the Terrain Hexes of a World Hex.

Sensor Mapping

Space Sensors can provide the information available to for the creation of maps as it becomes available.

At each distance, available sensors produce information (in an interactive process involving the referee, the player, the tables, and dice).

The Space Sensors Charts shows the information that ordinary sensors can acquire in the course of operation.

World Dimensions

The **Traveller Mapping System** uses 12 different size World Maps corresponding to UWP Size.

The World Map Appendix provides these individual blank maps.

World Map

WORLD MAP DIMENSION DETAILS

Size	1	2	3	4	5	6	7	8	9	10
Miles	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000	10,000
Diameter	1,600	3,200	4,800	6,400	8,000	9,600	11,200	12,800	14,400	16,000
Radius	800	1,600	2,400	3,200	4,000	4,800	5,600	6,400	7,200	8,000
Circumference	5,027	10,053	15,080	20,106	25,133	30,159	35,186	40,212	45,239	50,265
Equator	5,027	10,053	15,080	20,106	25,133	30,159	35,186	40,212	45,239	50,265
Triangle Edge	1,005	2,011	3,016	4,021	5,027	6,032	7,037	8,042	9,048	10,053
Hex	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005
Hexes/Triangle	1	3	6	10	15	21	28	36	45	55
World Hexes	20	60	120	200	300	420	560	720	900	1100
Volume=	.002	.01	.05	.125	.25	.42	.67	1	1.424	1.95
(Density 1.0)*G=	.125	.25	.375	.50	.625	.75	.875	1	1.125	1.25

Dimensions in Km less noted (World Size equals diameter of the World in Miles). * Assumes Density comparable to Terra.
World Triangles. World Triangle size varies with World Size. A World Triangle edge has hexes equal to World Size.

WORLD MAP DIMENSION DETAILS

Size	11	12	13	14	15	16	17	18	19	20
Miles	11,000	12,000	13,000	14,000	15,000	16,000	17,000	18,000	19,000	20,000
Diameter	17,600	19,200	20,800	22,400	24,000	25,600	27,200	28,800	30,400	32,000
Radius	8800	9600	10400	11200	12000	12800	13600	14400	15200	16000
Circumference	55,292	60,319	65,345	70,372	75,398	80,425	85,451	90,478	95,504	100,531
Equator	55,292	60,319	65,345	70,372	75,398	80,425	85,451	90,478	95,504	100,531
Triangle Edge	11,058	2,011	3,016	4,021	5,027	6,032	7,037	8,042	9,048	10,053
Hex	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005
Hexes/Triangle	66	78	91	105	120	136	153	171	190	210
World Hexes	1320	1560	1820	2100	2400	2720	3060	3420	3800	4200
Volume=	2.6	3.375	4.29	5.35	6.59	8	9.59	11.39	13.39	15.62
(Density 1.0)*G=	1.375	1.5	1.625	1.75	1.875	2.0	2.125	2.25	2.375	2.5

Dimensions in Km less noted (World Size equals diameter of the World in Miles). * Assumes Density comparable to Terra.
World Triangles. World Triangle Size varies with World Size. World Triangle Edge has hexes equal to World Size.

ALTERNATE DENSITIES-1

Size	1	2	3	4	5	6	7	8	9	10
World Hexes	20	60	120	200	300	420	560	720	900	1100
(Density 1.1) *G=	.14	.30	.49	.72	1.00	1.32	1.69	2.13	2.64	3.22

Comments= A Size=5 World with 1.1 Density has 1 G Surface Gravity and probably high concentrations of heavy metals.

ALTERNATE DENSITIES-2

Size	11	12	13	14	15	16	17	18	19	20
World Hexes	1320	1560	1820	2100	2400	2720	3060	3420	3800	4200
(Density 0.4) *G=	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00

Comments= A Size=20 World with 0.4 Density has 1 G surface Gravity and six times the surface hexes of Earth. It is probably low in heavy metals.

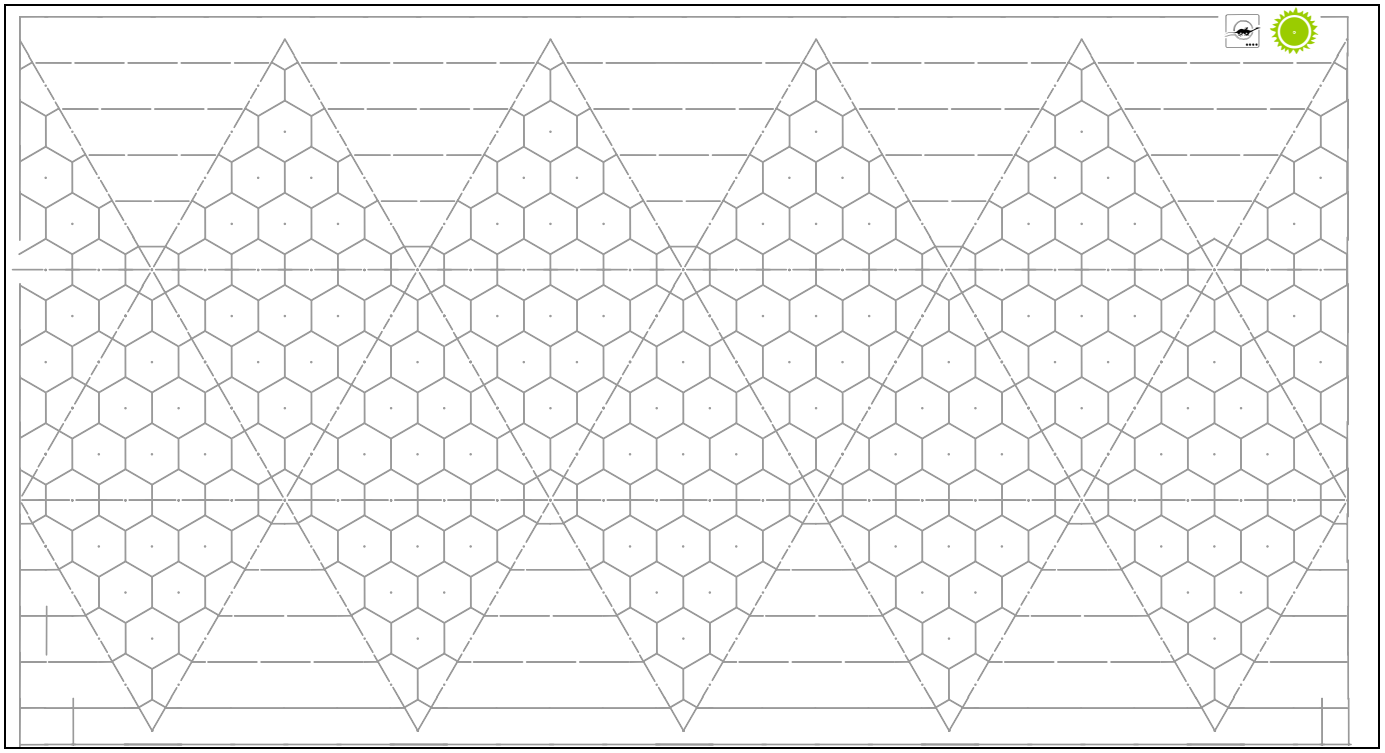
The World Map

The **Traveller Mapping System** uses constant size world hexes to map worlds over a wide range of sizes.

The World Map Appendix provides these individual blank maps.

World Map

EXAMPLE: SIZE 5 WORLD MAP



Example World Map-5

This world is Size=5 (a diameter of 5,000 miles).
Each World Hex is 1,000 km across.
Each World Triangle edge is Size times 1000 km, or Size in World Hexes.
Equatorial Circumference = Size times World Size times 5 in world Hexes.
Equatorial Circumference = World Triangle Edge times 5.

The Northern and Southern World Triangles fold to create a sphere. Moving from one edge of a World Triangle to its lateral partner traverses no space and costs no time.

The World Triangle

The World Triangle is the basic division of a world's surface.

World Triangle

THE WORLD TRIANGLE

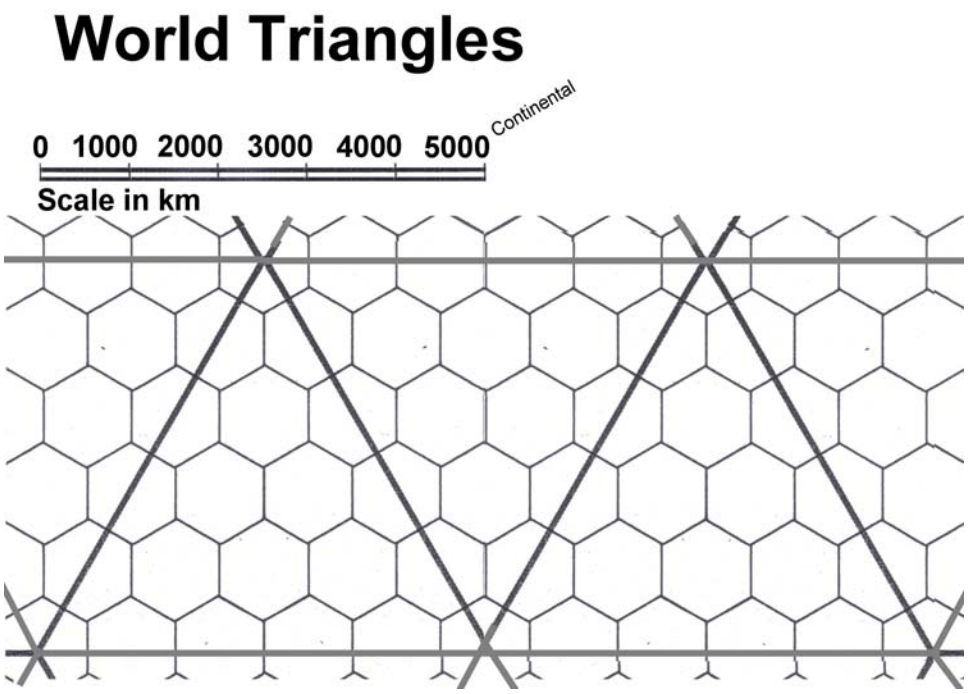
Worlds (planets, satellites) are mapped using a standard geodesic grid composed on constant size World Hexes.

The World Triangle

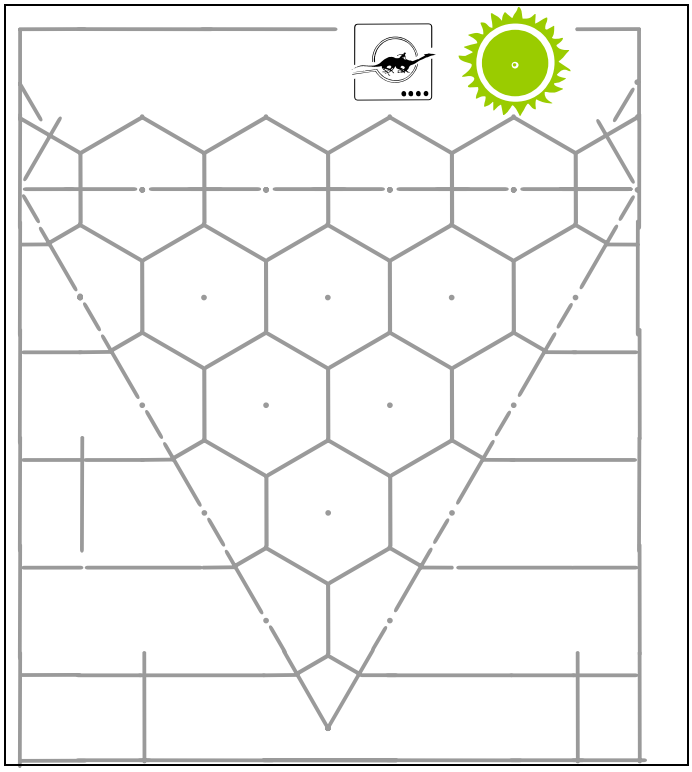
Each World is divided into 20 World Triangles, each of which has a number of World Hexes along each edge equal to World Size.

Continental. The World Triangle is described as Continental in size, a fact which makes the term variable from world to world. Continental can refer to an area as small as 1,000 km (on a Size-1 world) to 10,000 km (on a Size-10 World) or larger.

Terrain. World Triangles are not described in terms of Terrain. Each of its component World Hexes is characterized by Terrain.



EXAMPLE: SIZE 5 WORLD TRIANGLE



The World Hex

The World Hex is 1000 km in diameter (count 10 hexes from any edge to any opposite edge).

World Hex

THE WORLD HEX

Worlds (planets, satellites) are mapped using a standard geodesic grid composed on constant size World Hexes.

Each World Hex is 1000 km from vertex to vertex or 850 km flat to flat.

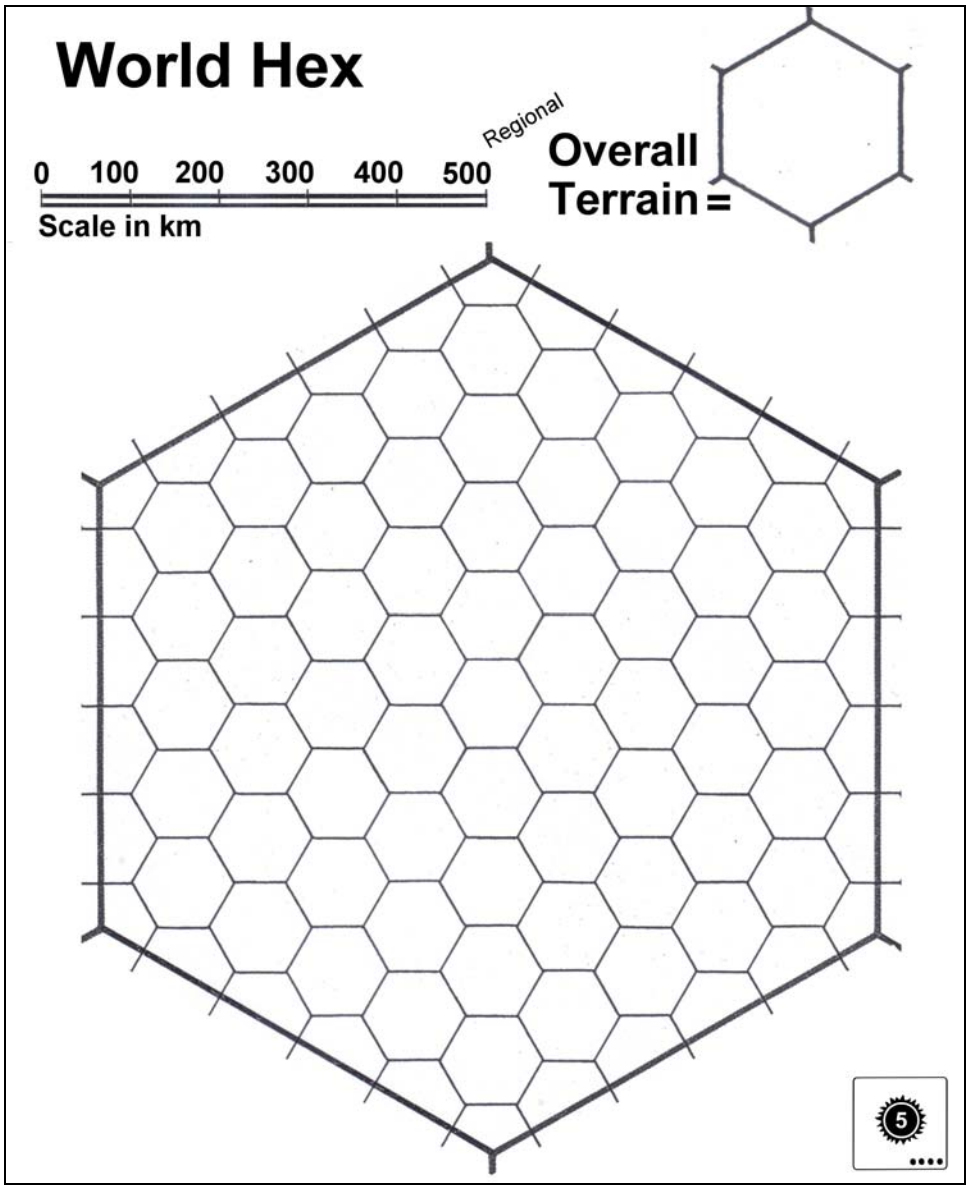
Terrain

Each World Hex overall has a basic terrain designation (or sometimes a combination of designations):

The **Overall Terrain Hex** shows this value.

The hexagons within the large World Hex are Terrain Hexes. A World Hex is composed of 75 Terrain Hexes.

A Terrain Hex is 100 km wide (flat to flat).



The Terrain Hex

The Terrain Hex is 100 km in diameter (count 10 of 10 km each from any edge to any opposite edge).

THE TERRAIN HEX

Worlds (planets, satellites) are mapped using a standard geodesic grid composed of constant size World Hexes.

The World Hex

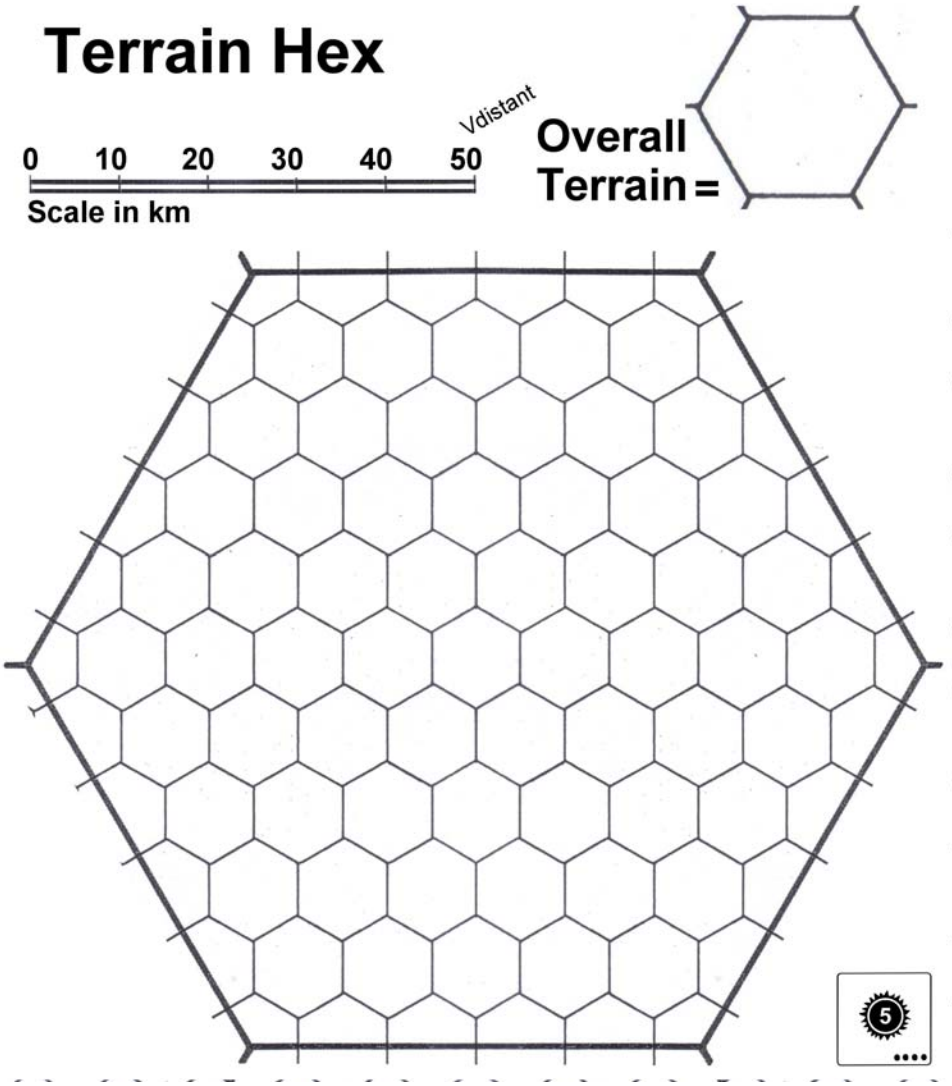
Each World Hex is 1000 km from vertex to vertex or 850 km flat to flat.

The Terrain Hex

A World Hex is composed of 60 Terrain Hexes. A Terrain Hex is 100 km wide (flat to flat) or 114 km vertex to vertex.

The Local Hex

A Terrain Hex is composed of 60 Local Hexes. Each Local Hex is 10 km wide (flat to flat) or 11.4 km vertex to vertex.



The Local Hex

The Local Hex is 10 km in diameter (count 10 hexes of 1 km each from any edge to any opposite edge).

Local Hex

THE TERRAIN HEX

Worlds (planets, satellites) are mapped using a standard geodesic grid composed on constant size World Hexes.

The World Hex

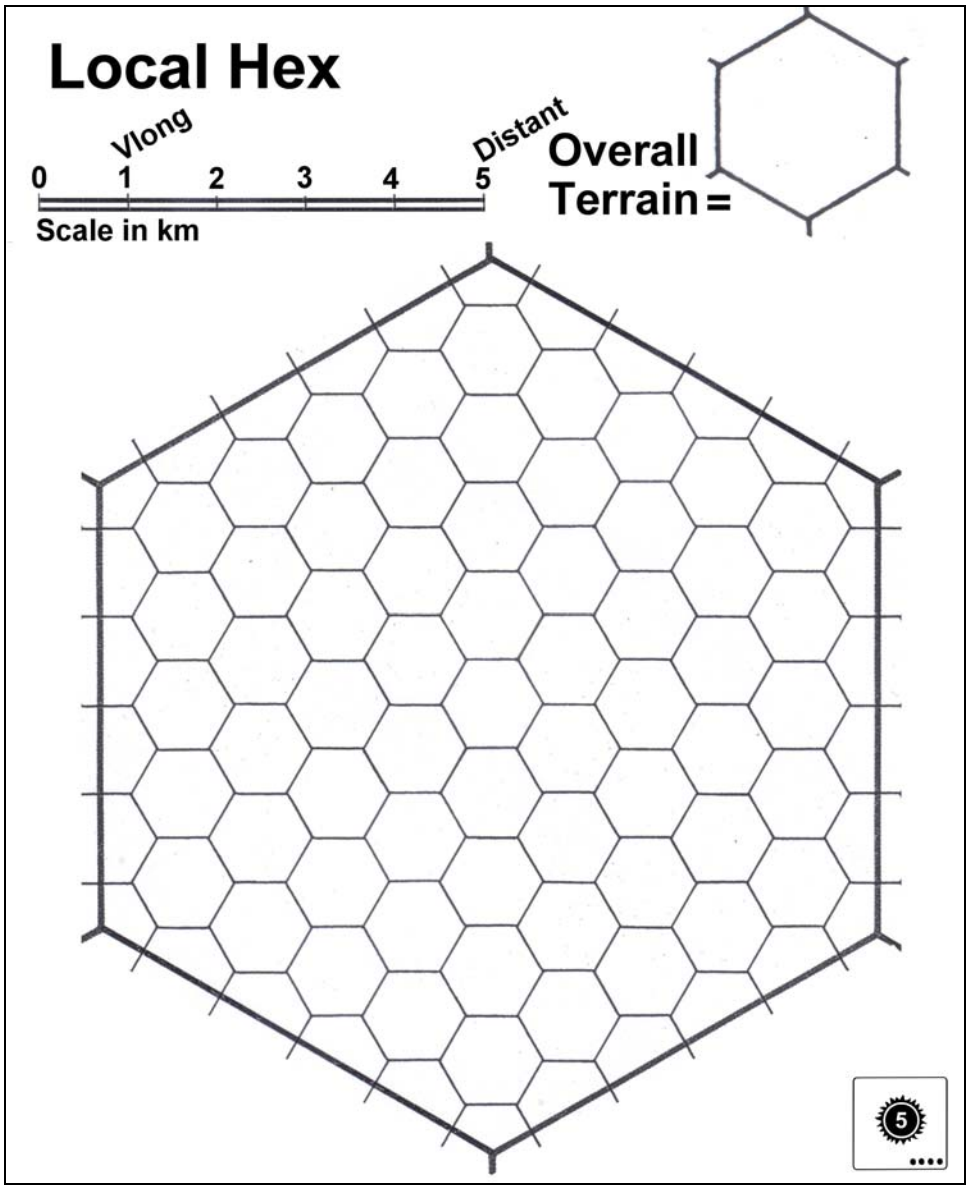
Each World Hex is 1000 km from vertex to vertex or 850 km flat to flat.

The Terrain Hex

A World Hex is composed of 60 Terrain Hexes. A Terrain Hex is 100 km wide (flat to flat) or 114 km vertex to vertex.

The Local Hex

A Terrain Hex is composed of 60 Local Hexes. Each Local Hex is 10 km wide (flat to flat) or 11.4 km vertex to vertex.



The Single Hex

The Single Hex is 1 km in diameter (count 10 hexes of 100 meters from any edge to any opposite edge).

THE TERRAIN HEX

Worlds (planets, satellites) are mapped using a standard geodesic grid composed on constant size World Hexes.

The World Hex

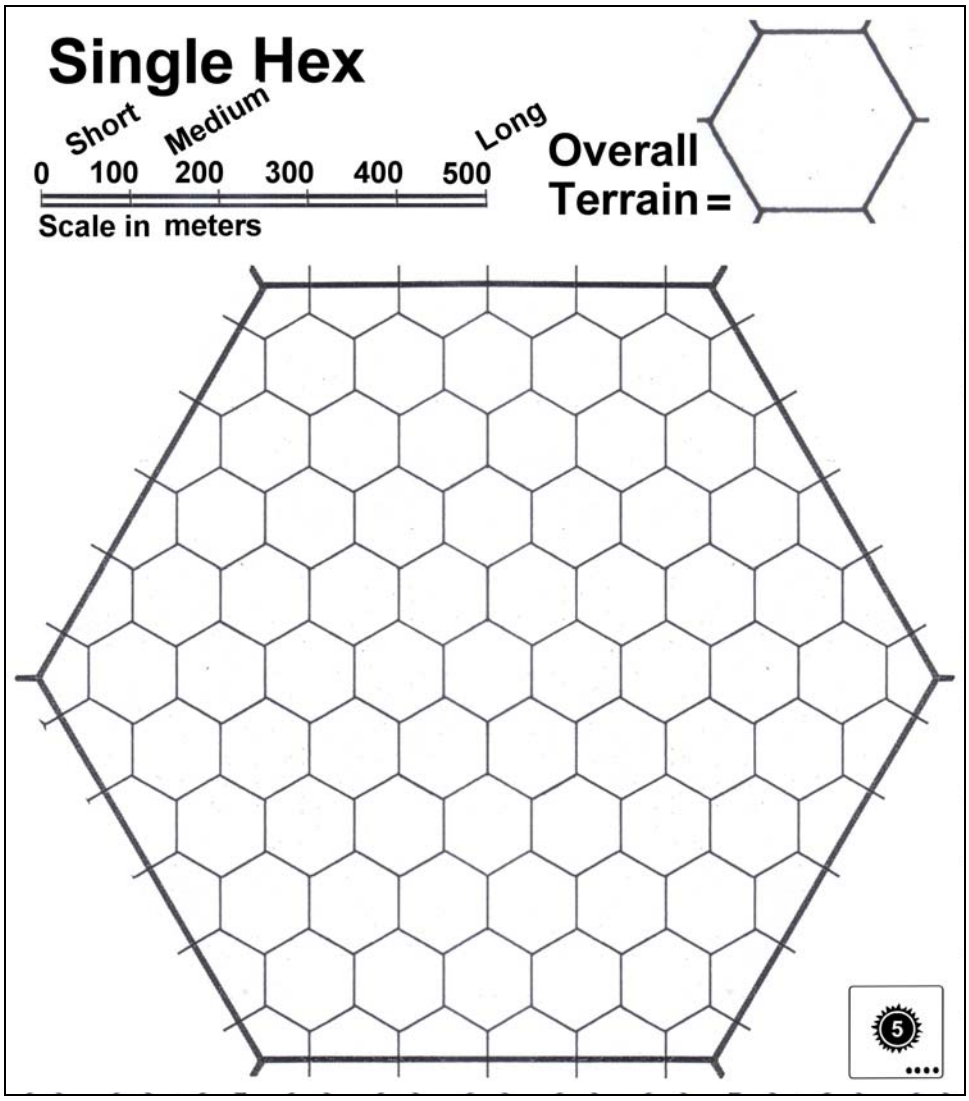
Each World Hex is 1000 km from vertex to vertex or 850 km flat to flat.

The Terrain Hex

A World Hex is composed of 60 Terrain Hexes. A Terrain Hex is 100 km wide (flat to flat) or 114 km vertex to vertex.

The Local Hex

A Terrain Hex is composed of 60 Local Hexes. Each Local Hex is 10 km wide (flat to flat) or 11.4 km vertex to vertex.



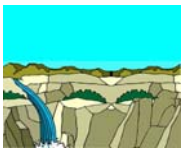
Terrain Symbols

The various terrain types are shown here for reference.

Terrain - 1


Clear


Marsh


Rough


Clear Wood


Swamp


Rough Wood


Mountain


Desert


Chasm


Cropland


Rural


Ruins


Ocean


Islands


Shore

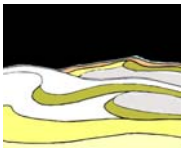

River


Lake


Ice Cap


Baked Lands


Twilight Zone


Frozen Lands


Ice Field


Precipice


Exotic


City


Dome


Arcology


Suburb


Town


Starport


Highway


Road


Trail


Air Corridor

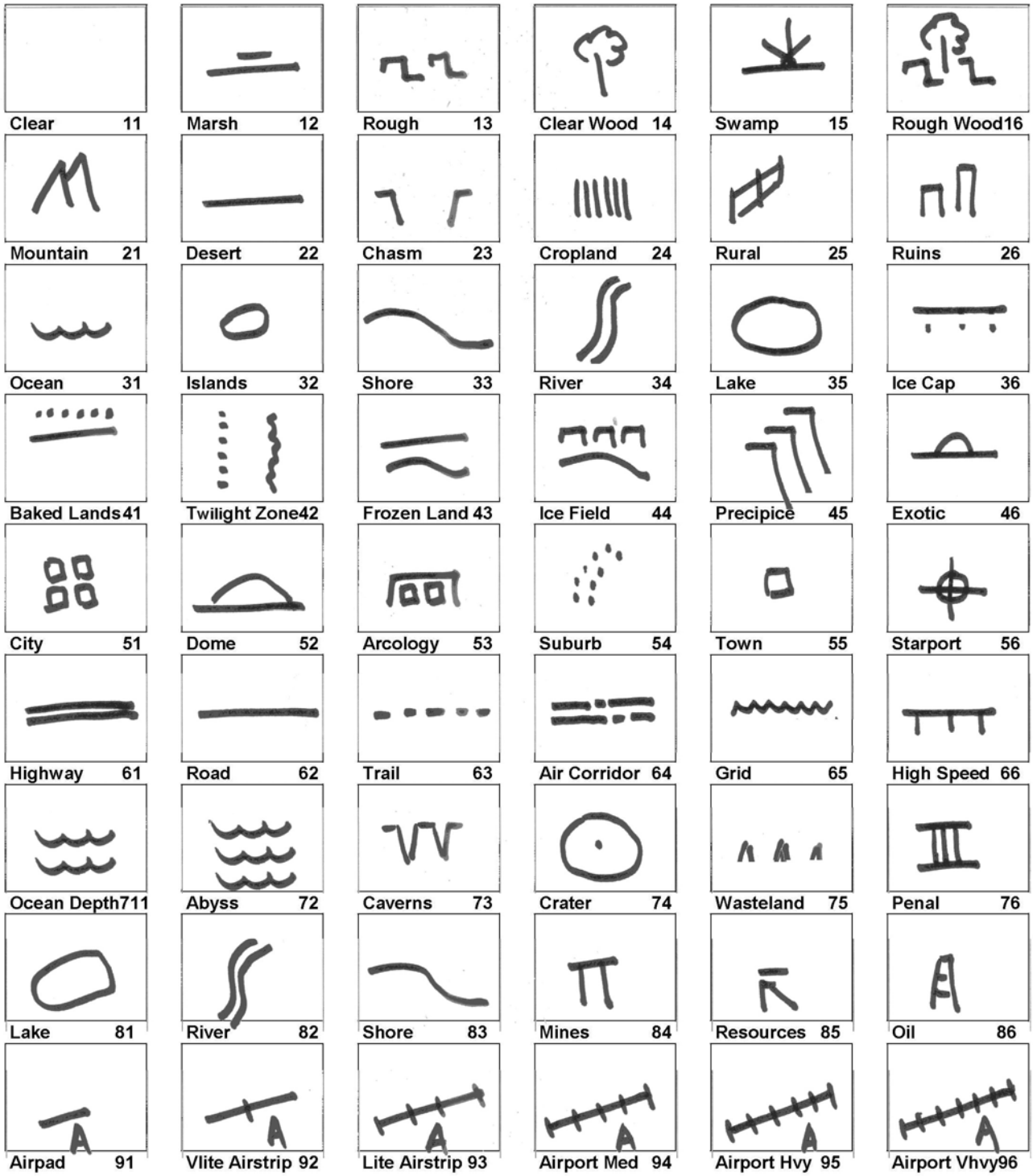

Grid


High Speed

Terrain Symbols By Hand

The various terrain types are shown here for reference.

Terrain



Terrain Symbols (by hand)

Record your personal preferences for hand drawn terrain symbols here.

Terrain (by hand)

11 Clear	**12** Marsh	**13** Rough	**14** Clear Wood	**15** Swamp	**16** Rough Wood
21 Mountain	**22** Desert	**23** Chasm	**24** Cropland	**25** Rural	**26** Ruins
31 Ocean	**32** Islands	**33** Shore	**34** River	**35** Lake	**36** Ice Cap
41 Baked Lands	**42** Twilight Zone	**43** Frozen Lands	**44** Ice Field	**45** Precipice	**46** Exotic
51 City	**52** Dome	**53** Arcology	**54** Suburb	**55** Town	**56** Starport
61 Highway	**62** Road	**63** Trail	**64** Air Corridor	**65** Grid	**66** High Speed
71 Ocean Depths	**72** Abyss	**73** Caverns	**74** Crater	**75** Wasteland	**76** Penal Colony
81 Volcanic	**82** Noble Estate	**83** Reserve	**84** Mines	**85** Resources	**86** Resources Oil

Terrain Numbers allow coding of terrain types in tables.

Random Place Selection

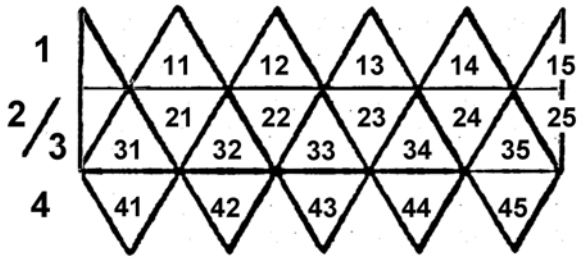
Locations for places (Triangles, World Hexes, Terrain Hexes, Local Hexes) and for the placement of terrain can be randomly selected.

Random

RANDOM PLACES

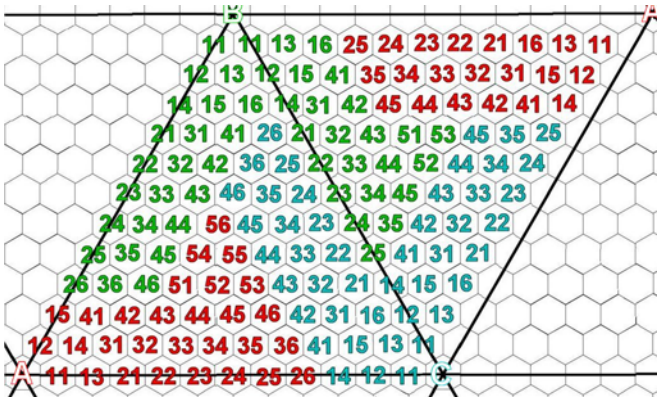
When the situation requires, a random location can be selected using die rolls.

MOARN. Consistent with the MOARN Map Only As Really Necessary concept, locations for terrain, goals, destinations, or situations can be created randomly when they are required.



Select A Triangle On The World Map

To randomly select a Triangle on the World Map, roll 1D for the row (if the roll is 5 or 6, reroll). Roll 1D for the Triangle (if the roll is 6, reroll).



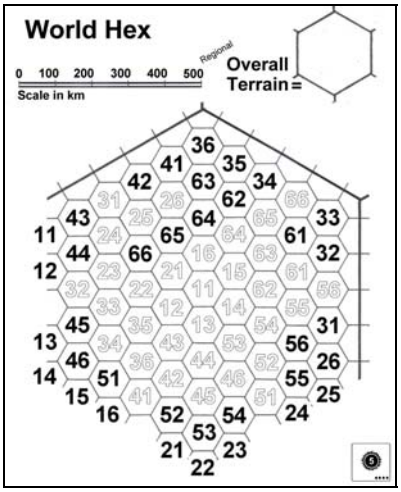
Select A World Hex In A Triangle

To randomly select a World Hex within a Triangle, determine if the Triangle is vertex UP or vertex DOWN.

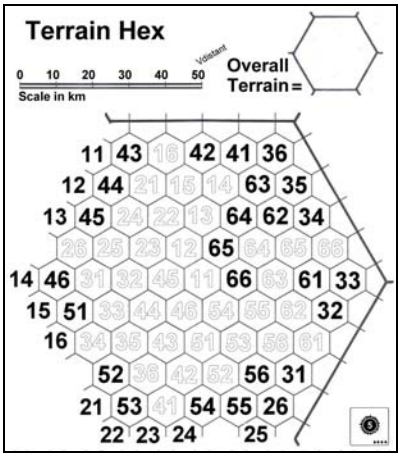
On the diagram, roll 1D to select vertex A, B, or C. Then roll 2D for the hex location.

If the Triangle is smaller than the roll, re-roll.

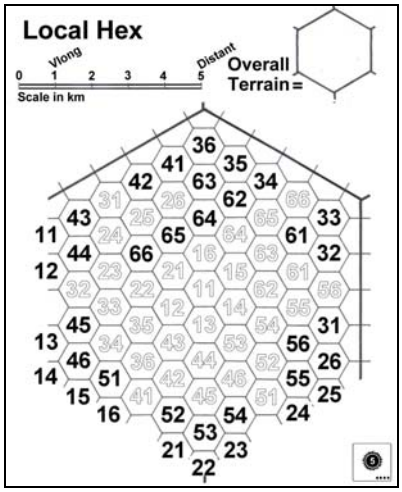
This random selection will not locate a Pent.



Select A Terrain Hex Within A World Hex



Select a Local Hex Within A Terrain Hex



Select a Single Hex Within A Local Hex

Roll 1D to determine (1-2-3=) Black or (4-5-6=) White Numbers. Roll 2D for the specific Hex. This random selection will not locate any of the three blank edge hexes.

Creating World Maps

World Maps are populated with a subset of Terrain Types to create an overview of the world's features. Individual Terrain Hexes are then created as they are needed.

World Map

WORLD DETAILS

St	S	A	H	P	G	L		T	TCs	L	R	I	B	HZ
							-							

Enter UWP, Trade Classifications, Ex, and HZ: applicable TCs= Ic, Va, De, Tu, Fr, Ag, Fa, Di, Lo, Ni, Hi, Tz.

GENERATING THE WORLD MAP

1. Select a blank World Map based on World Size.
2. **Resources.** Determine Resources from the Economic Extension. Subtract system GG and Belts: place the resulting number of Resource Hexes one per Triangle.
3. **Mountains**. Place 1D Mountains in each Triangle.
4. **Chasms.** Place Size x Chasms one per Triangle.
5. **Precipices.** Place Size x Precipices one per Triangle.

If Di 6. **Die-Back.** Place 1D Ruins in each Triangle.

If Va 7. **Vacuum Plain.** Place 1D Craters per Triangle.

If De 8. **Desert.** Mark all unmarked hexes Desert.

9. **Oceans.** Randomly select Hyd x 2 Triangles as Oceans. Consolidate Ocean Triangles that share sides. Enclose Oceans with Shore lines. Non-Ocean Triangles are Continents (they are not consolidated; treat each Triangle as a separate Continent).

10. **Seas.** Randomly select Hyd Continents and place a one-hex Sea (Ocean) in each. Surround each with Shore in all adjacent hexes.

11. **Islands.** Convert each Mountain Hex in Ocean to Islands.

12. **Ice-Caps.** If HZ or greater, mark the top and bottom Hyd/2 rows as Ice Cap (if Hyd less than 2, no Ice Caps).

If Ic 13. **More Ice Cap.** Add 1D rows to each Ice Cap.

If Fr 14. **Frozen.** Mark Ocean as Ice Field and Land as Frozen Lands (except under Ice Cap).

If Tu 15. **Tundra.** Mark a line 1D hexes above and below the Equator. Between each line and the Poles, mark Ocean as Ice Field and Land as Frozen lands (except under Ice Cap).

If Ag 16. **Agricultural.** Place 2D Cropland in each Continent.

If Fa 17. **Farming.** Place 1D Cropland in each Continent.

If Lo 18. **Low Population.** Place one Town. Skip to 20.

If Ni 19. **Non-Industrial.** Place one Town. Skip to 20.

20. **Cities.** Place Cities equal to Pop, one per Continent. If Atm=0-1, A-C, or E4, then mark as Domed.

If Hi 21. **High Population.** Place total Pop/2 Archologies.

22. **Rural.** Mark clear hexes within Pop hexes of City as Rural.

23. **Starport.** Place the World Starport (or Spaceport).

If Tz 24. Select one Pole Triangle and draw a vertical line directly down. Shift 2.5 times World Size hexes to one side and draw a parallel line: this is the one-World-Hex-wide Twilight Zone.

If Tz 25. Mark one side of the Twilight Zone as Baked Lands and the other side as Frozen Lands (overlaying existing terrain). Terrain in the Twilight Zone remains are previously created. Convert Ocean in Baked Lands to Desert. Convert Ocean in Frozen Lands to Ice Field.

If Pe 26. **Penal Colony.** Mark Pop x Penal one per Triangle.

27. **Wasteland.** If TL>5, mark 1D adjacent hexes in one Triangle Wasteland.

28. **Exotic.** Place one Exotic hex in one Triangle.

29. All other terrain remains Clear.

AVAILABLE TERRAIN

Resource
Mountains
Chasm
Precipice
Ruins
Crater
Desert
Ocean
Shore
Islands
Ice Caps
Ice Field
Frozen Lands
Cropland
Town
City
Domed
Archology
Rural
Starport
Twilight Zone
Baked Lands
Penal
Wasteland
Exotic
Clear

Filling In World Hexes -1

Individual Terrain Hexes within a World Hex are created as they are needed. The process involves selecting a World Hex and generating or creating the individual Terrain hexes within it.

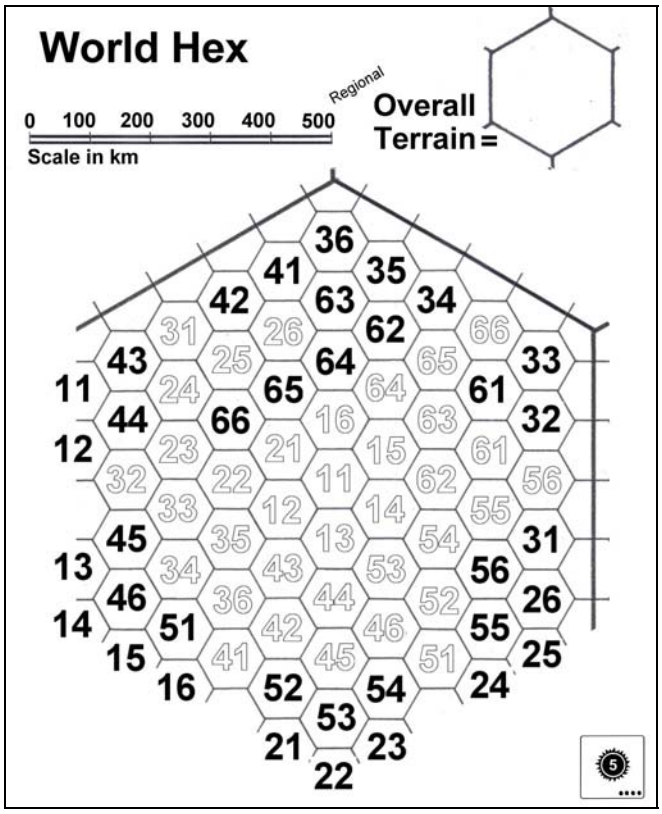
World Hex-1

SELECT THE WORLD HEX

Select the World Hex and note its Overall Terrain.

General Concept. The world Hex is divided into 75 Terrain Hexes, which are numbered 11-66 in Blank and 11-66 in White. There are also three unnumbered hexes (which are Clear on Land or Ocean if Water).

Each World Hex is 1000 km wide. The Terrain Hexes within the World Hex are 100 km wide.



Populating World Hexes-2

The detailed terrain within a World Hex is called for only when hex becomes important. The procedures below guide the creation of that terrain.

World Hex-2

ALLOCATE TERRAIN

The World Hex is 1000 km in diameter and contains 75 individual Terrain hexes, each about 100 km in diameter.
If the World Hex is Shore, draw a Shore Line through the hex.
If the Terrain is Precipice, draw a Precipice line through the hex.

If World Hex=	Note	The White Terrain hex:	The Black Terrain hex is
Ocean. Sea.	Oc	Ocean. If surrounding World Hexes are Ocean, mark Ocean Depth.	Ocean.
Shore		Ocean if on the Ocean side of Shore; otherwise Land.	Land.
Mountains		Mountain (if Shore, Land is Mountain; Ocean is Islands.).	Other.
Chasm		Select TWO WNH and connect them with a Chasm.	Other.
Precipice		Select TWO WNH and connect them with a Precipice.	Other.
Ruins		May be Ruins. Place Good Flux+1 Ruins in BNH.	Other
Crater		Place 2D Craters in WNH	Other.
Desert		Desert. Convert 2D WNH to Clear.	Desert.
Islands		May be Island. Place Good Flux+1 Islands in WNH.	Ocean.
Ice-Cap		Ice Cap.	Ice Cap.
Ice Field		Ice Field	Ice Field.
Frozen Lands		Frozen Lands.	Frozen Lands.
Cropland		Cropland.	Other
Town	Hi	May be Town. Place one Town in a WNH.	Other.
City	Hi	May be City. Place one City in a WNH.	Other.
Domed	Hi	May be Domed. Place one Domed in a WNH.	Other.
Archology		May be Archology. Place one Archology in a WNH.	Other.
Rural		Rural.	Other.
Starport		May be Starport. Place one Starport in a WNH.	Other.
Baked Lands		Baked Lands.	Baked Lands
Clear		May be Rough. Place 2D Rough in WNH.	
Clear	N1	May be Wood. Place 2D Wood in WNH.	
Clear	N2	May be Wetland. Place 2D Wetland in WNH.	
Clear	N3	May be Lake. Place Good Flux Lakes in WNH.	
Resource		May be Resource. Place 2D Resource in WNH.	
Wasteland		Wasteland.	Other
Penal		May be Town. Place one Town in WNH.	

WNH= White Numbered Hex(es). BNH= Black Numbered Hex(es).

Other= Other predominant Terrain Type (default = Clear).
Hi = If World is High Population, do this twice.
Oc= If World is Ocean World, mark Ocean surrounded by Depths as Abyss.
N1 = If Atmosphere = 3-4-5-6-7-8-9-A.
N2 = If Hydrographics = 2-3-4-5-6-7-8-9-A. May overlay Rough.
N3 = If Hydrographics = 2-3-4-5-6-7-8-9-A. May overlay Clear (creates Marsh) or Wood (creates Swamp).

Populating Terrain Hexes

The Terrain Hex is composed of 75 Local Hexes. The Overall Terrain for the Terrain Hex is transferred to about half of the Local Hexes, and the others are populated with a variety of terrain types.

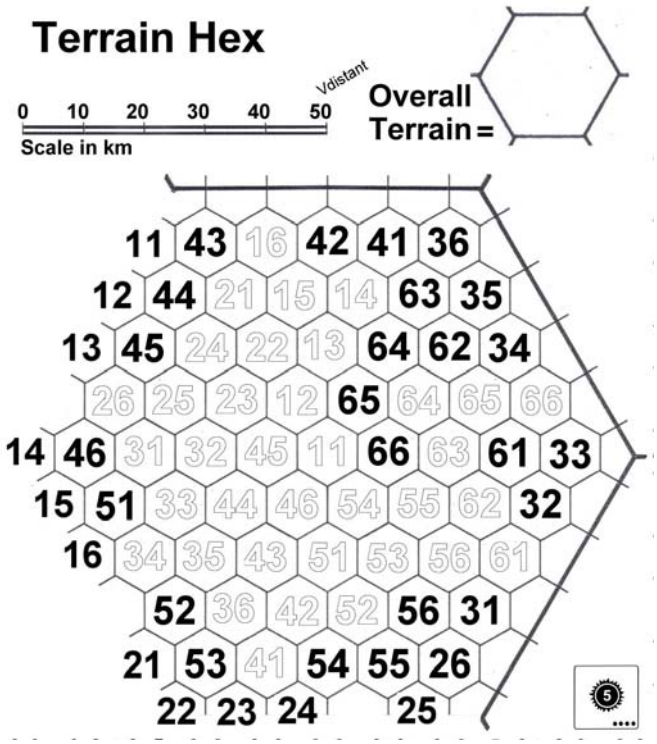
Terrain Hex

SELECT THE TERRAIN HEX

Select the Terrain Hex and note its Overall Terrain.

General Concept. The Terrain Hex is divided into 75 Local Hexes, which are numbered 11-66 in Blank and 11-66 in White. There are also three unnumbered hexes (which are Clear on Land or Ocean if Water).

Each Terrain Hex is 100 km wide. The Local Hexes within the Terrain Hex are 10 km wide.



Place appropriate terrain in the Local Hexes in the Terrain Hex.

Populating Local Hexes-1

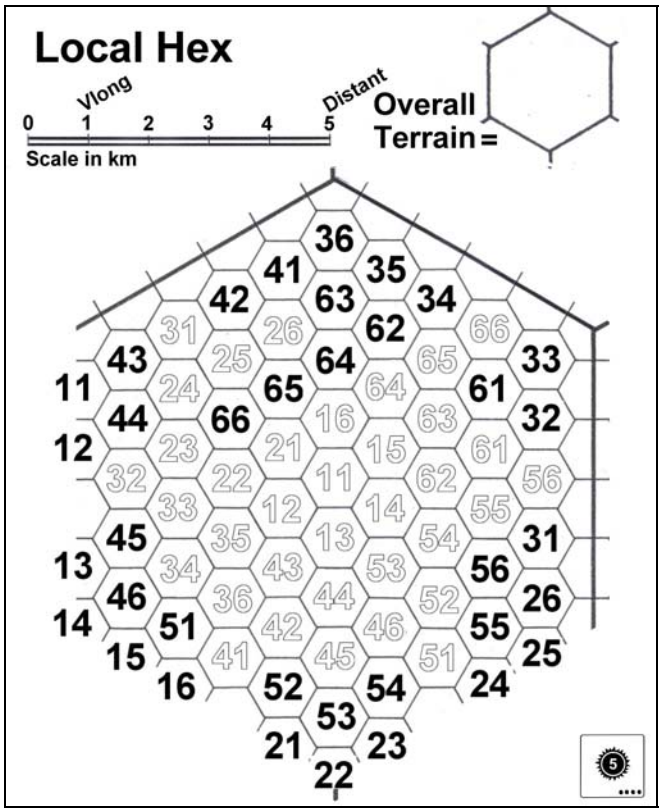
Individual Local Hexes are created as they are needed. The process involves selecting a Local Hex and generating or creating the individual Single hexes within it.

Local Hex

SELECT THE LOCAL HEX

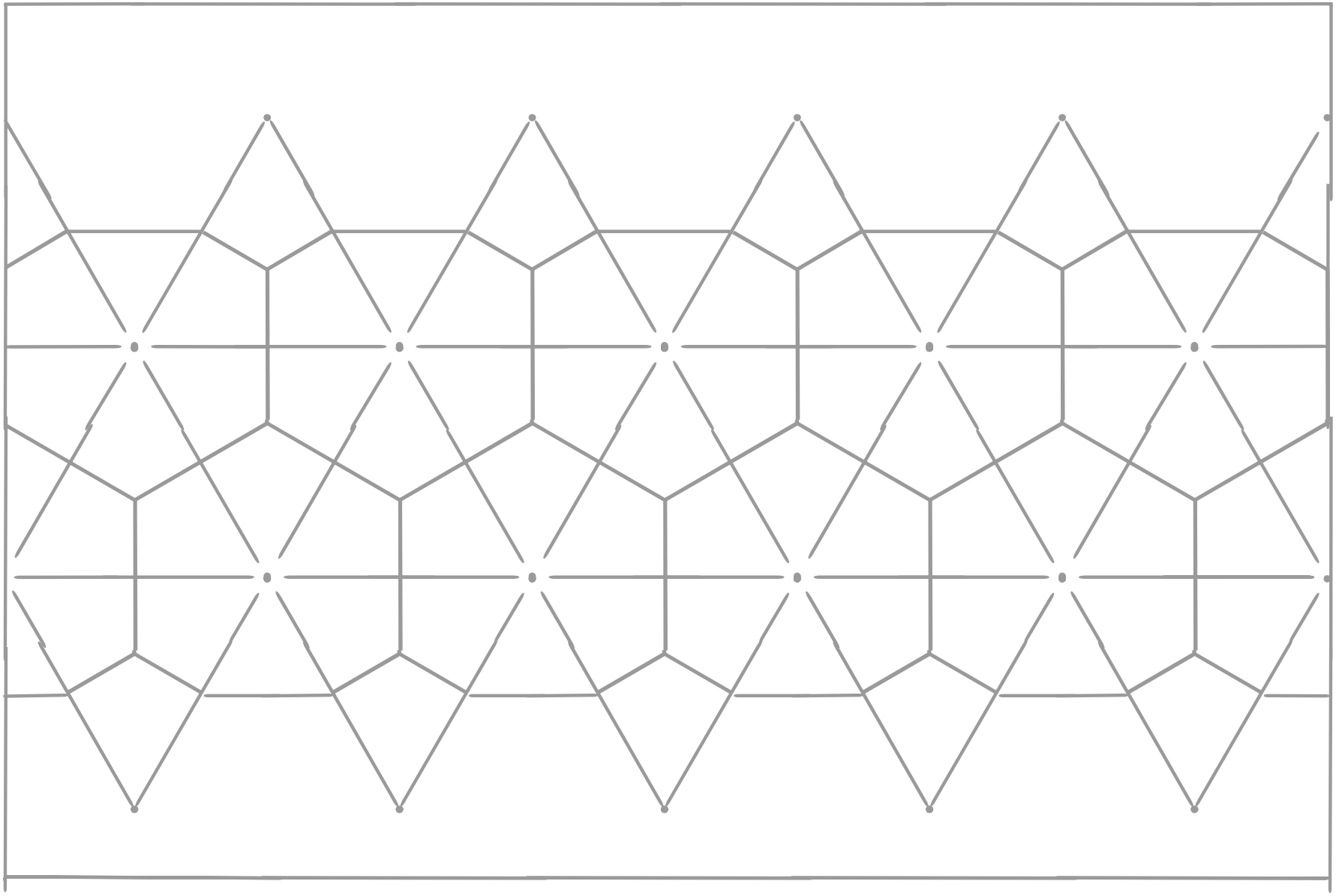
Select the Local Hex and note its Overall Terrain.

General Concept. The Local Hex is divided into 75 Single Hexes, which are numbered 11-66 in Blank and 11-66 in White.



Place appropriate terrain in the Single Hexes in the Local Hex.

Siz=				
1		Standard Geodesic World Map	World Name	UWP



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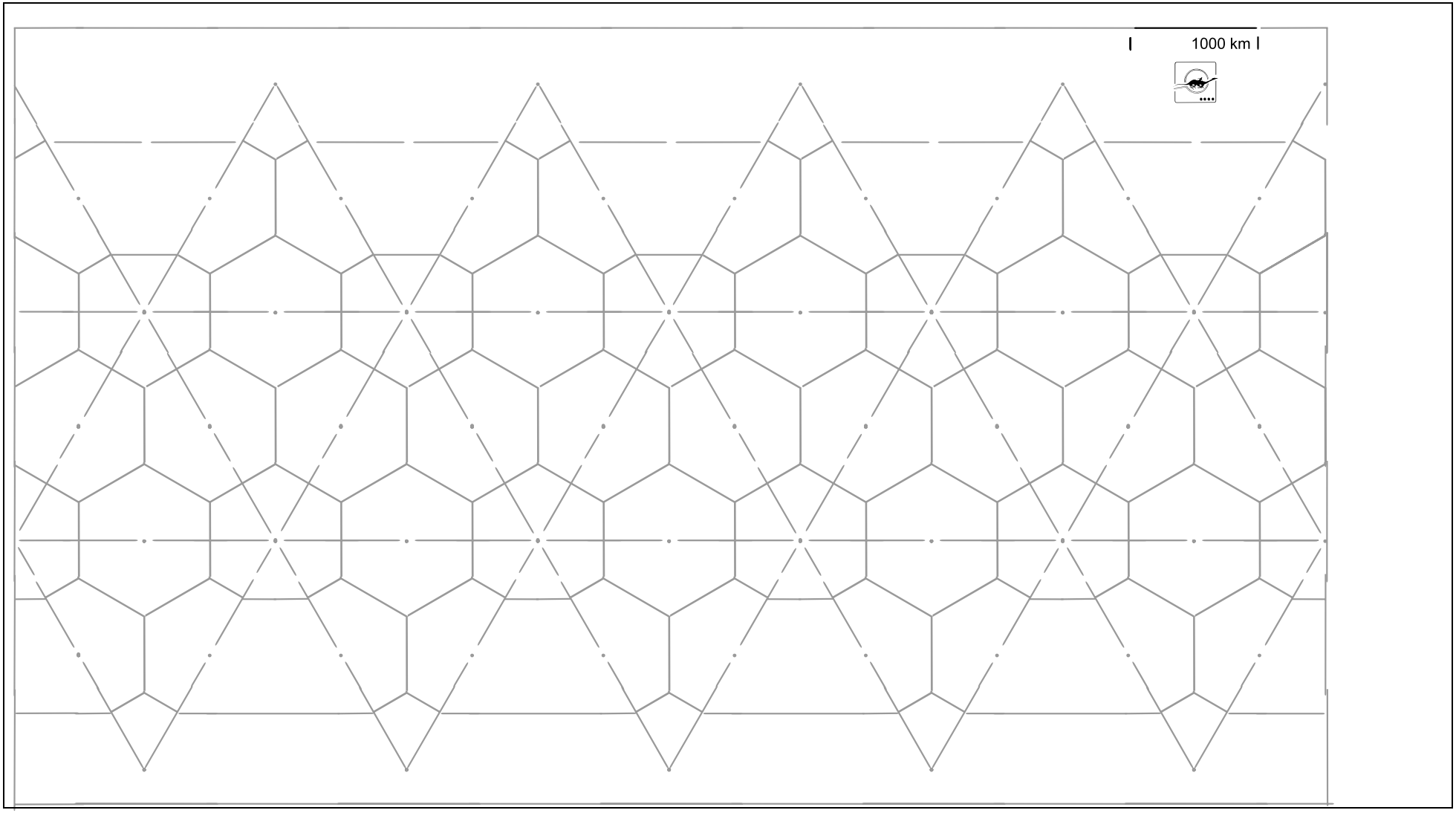

Siz=				
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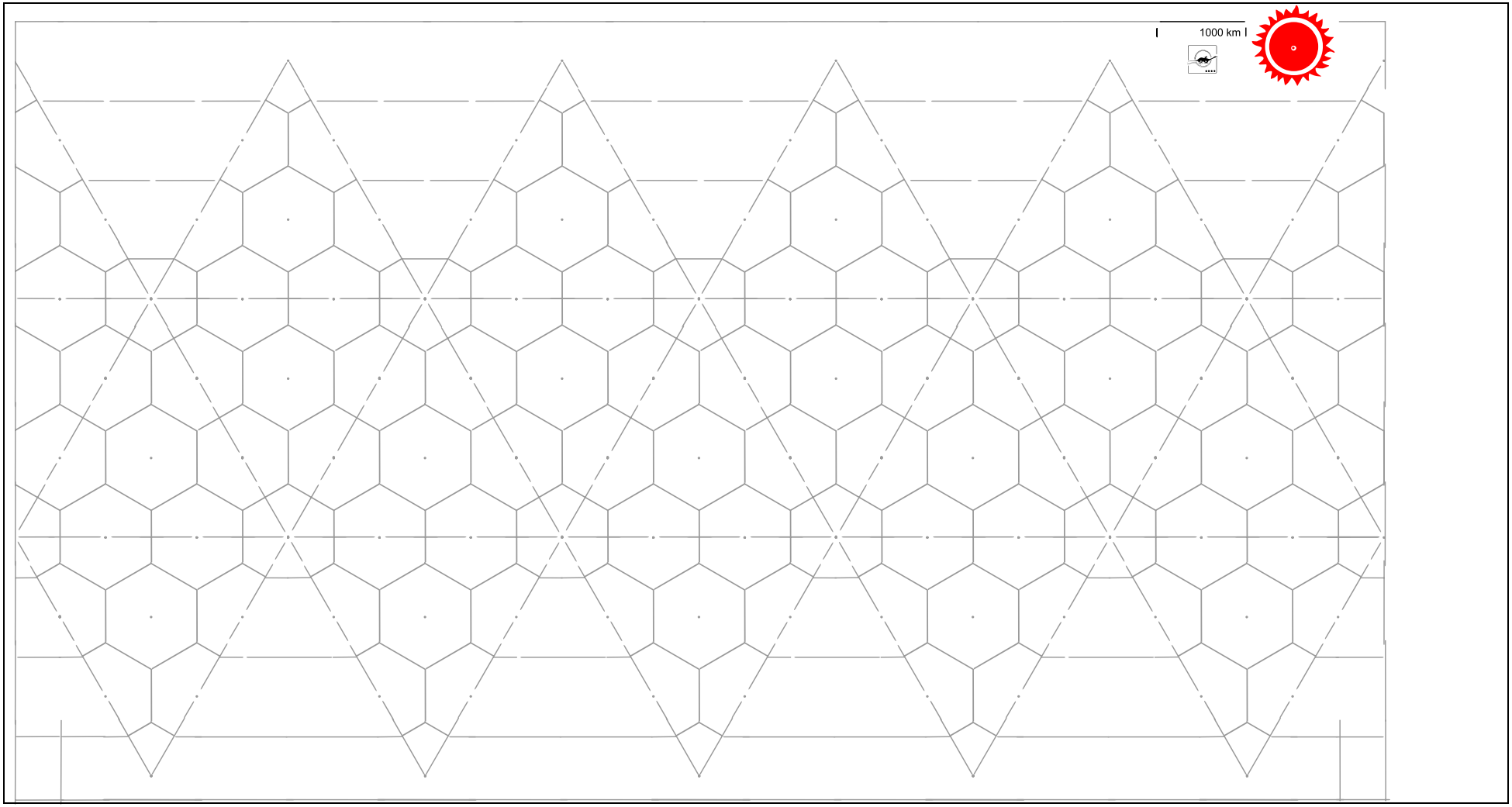
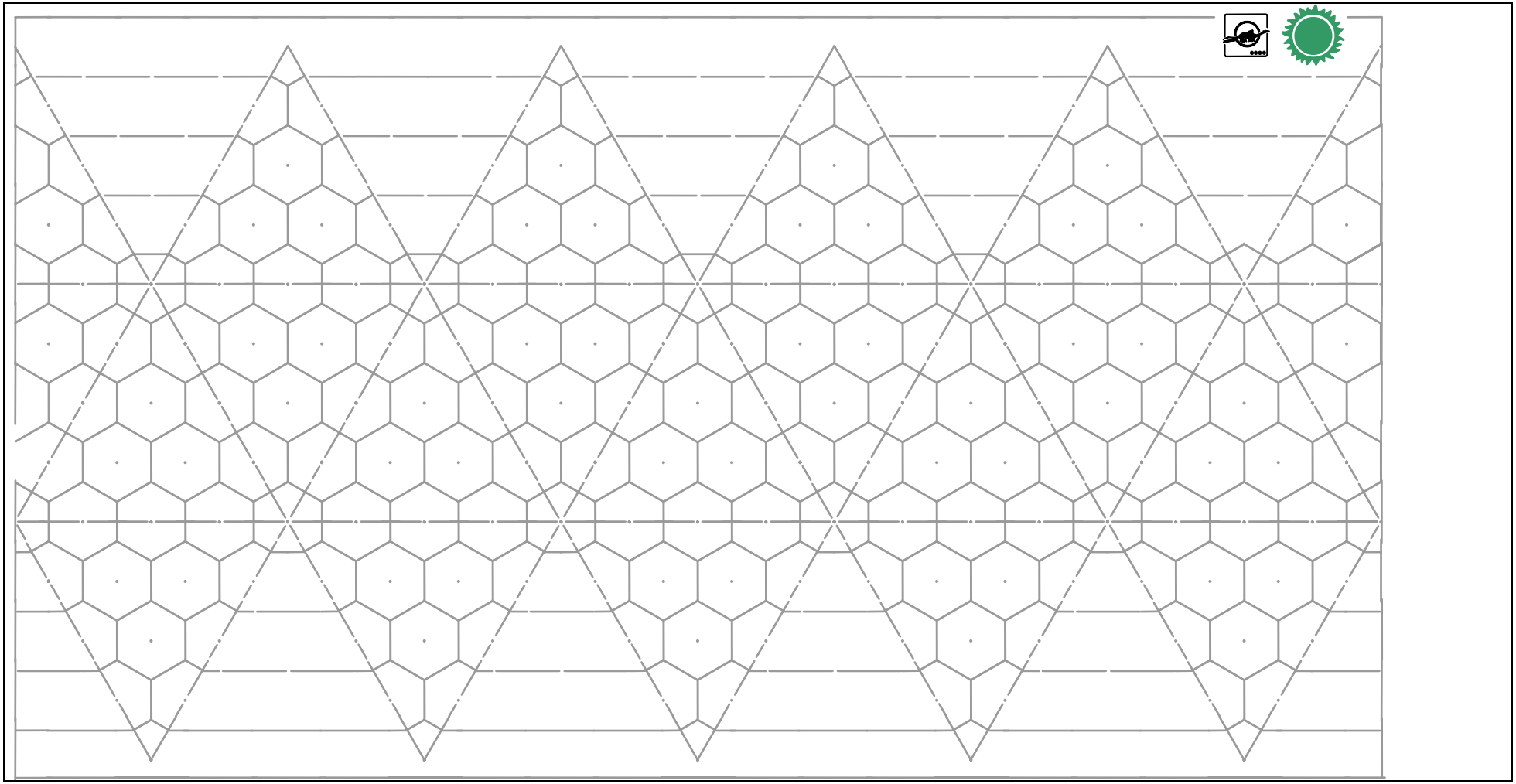


Siz= **4**		Standard Geodesic World Map	World Name	UWP



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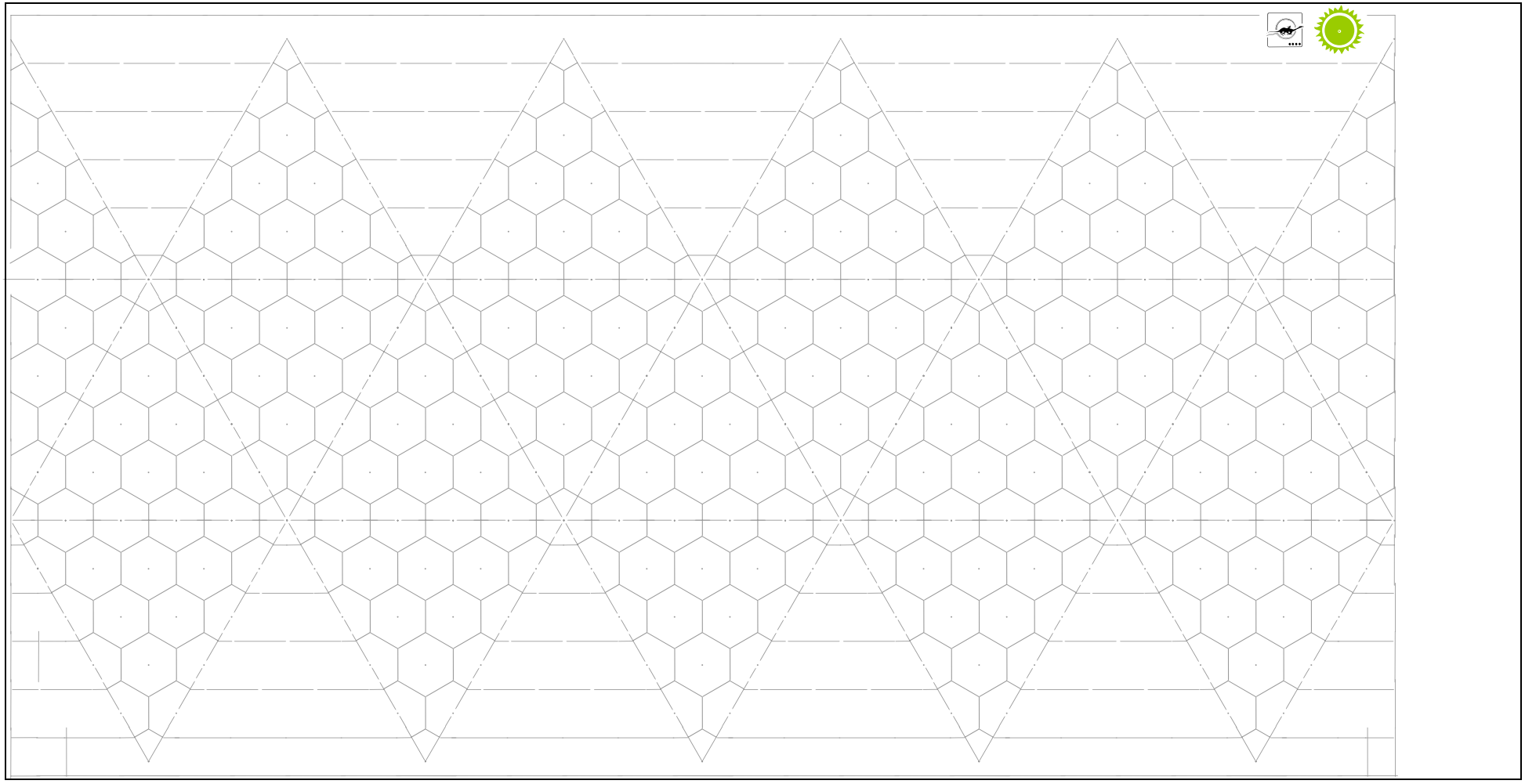

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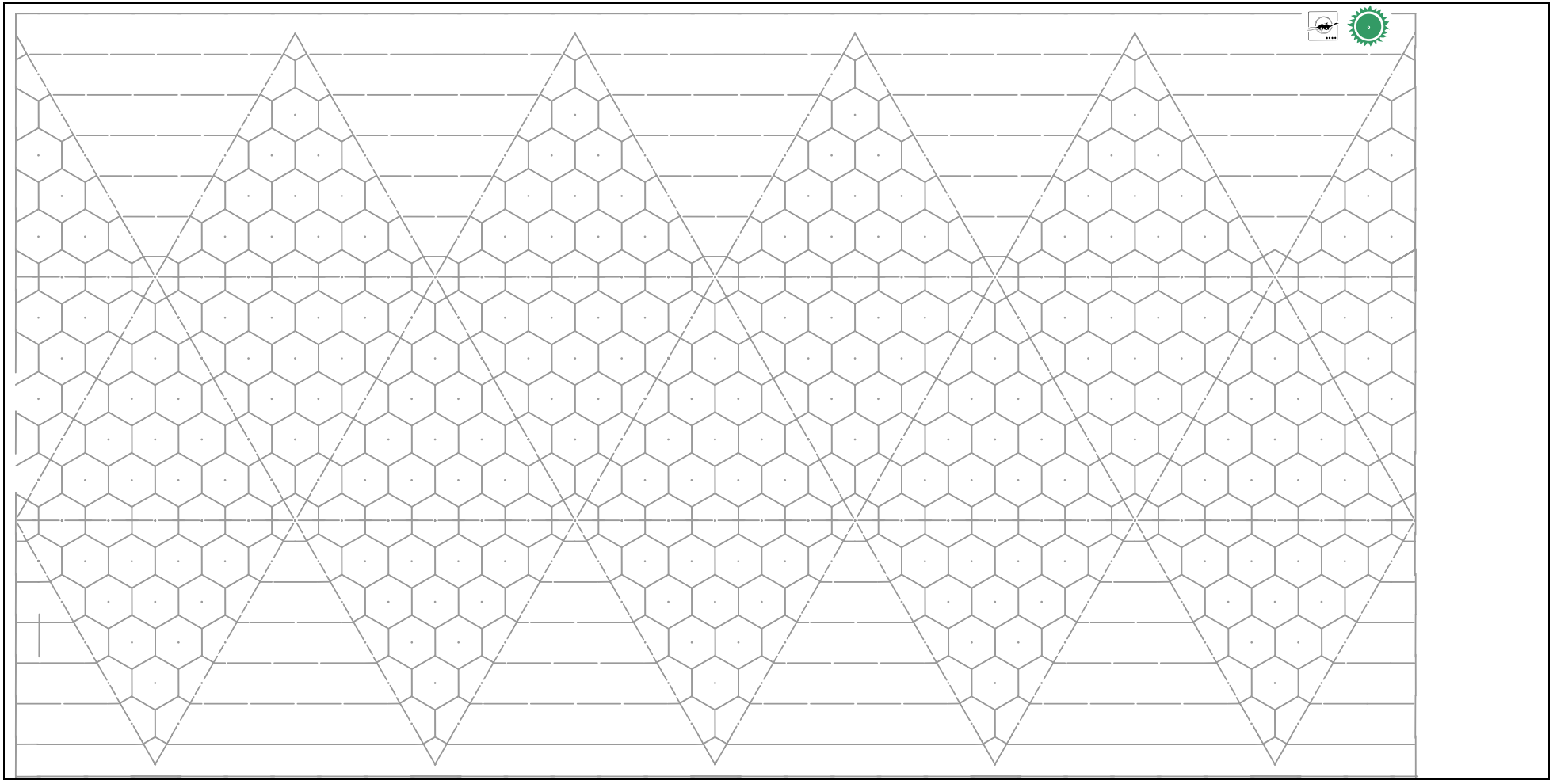

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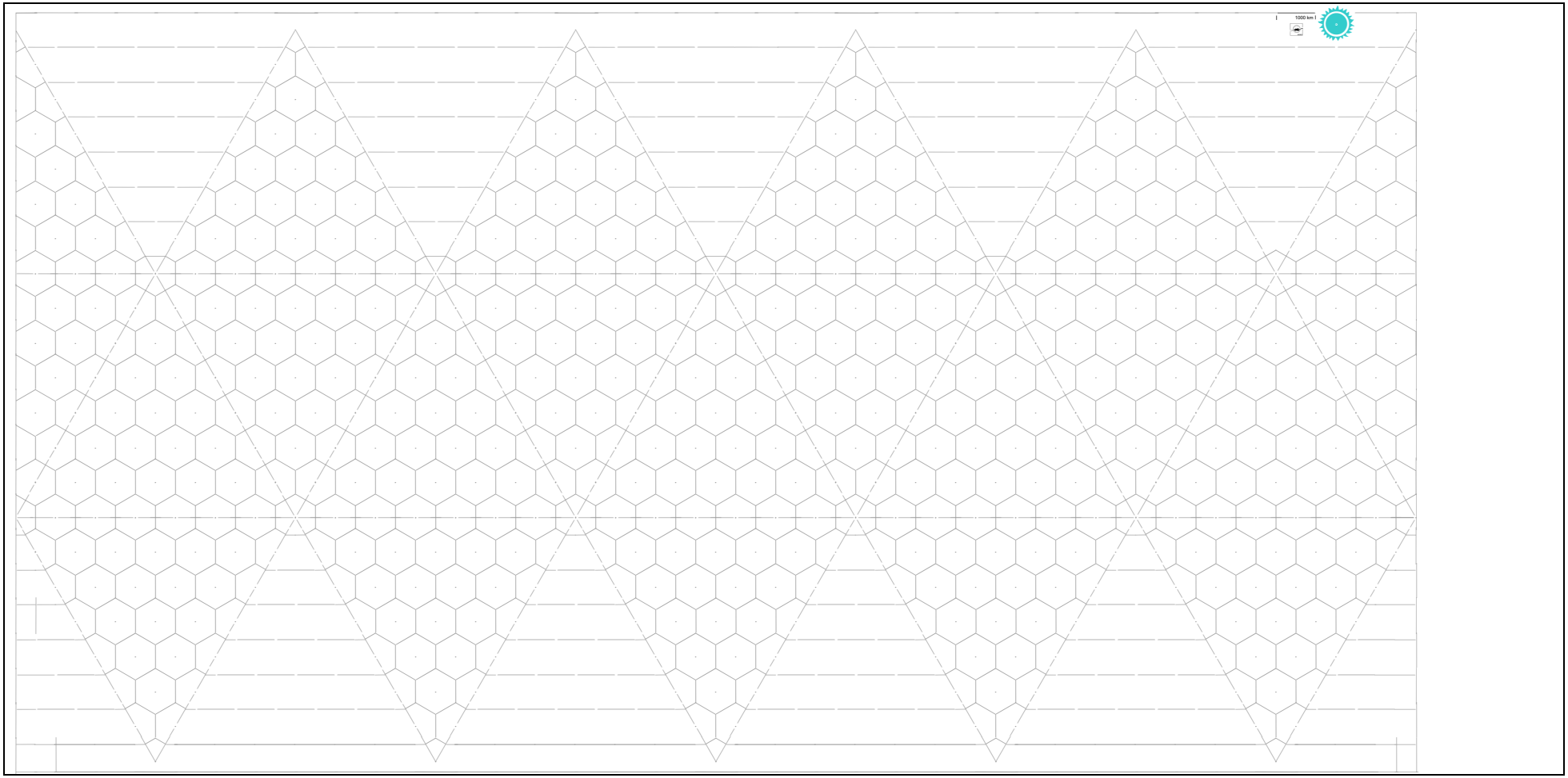

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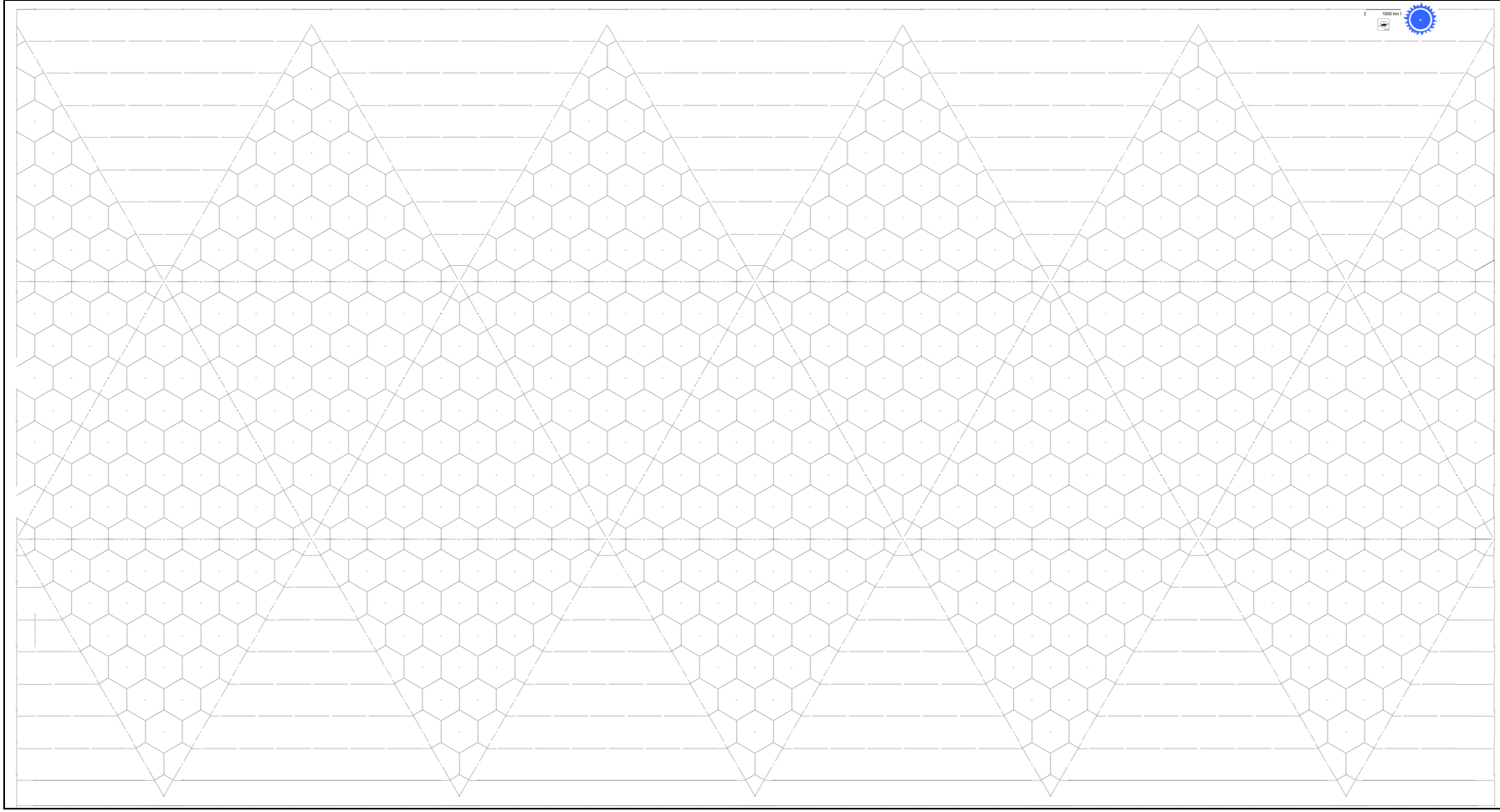

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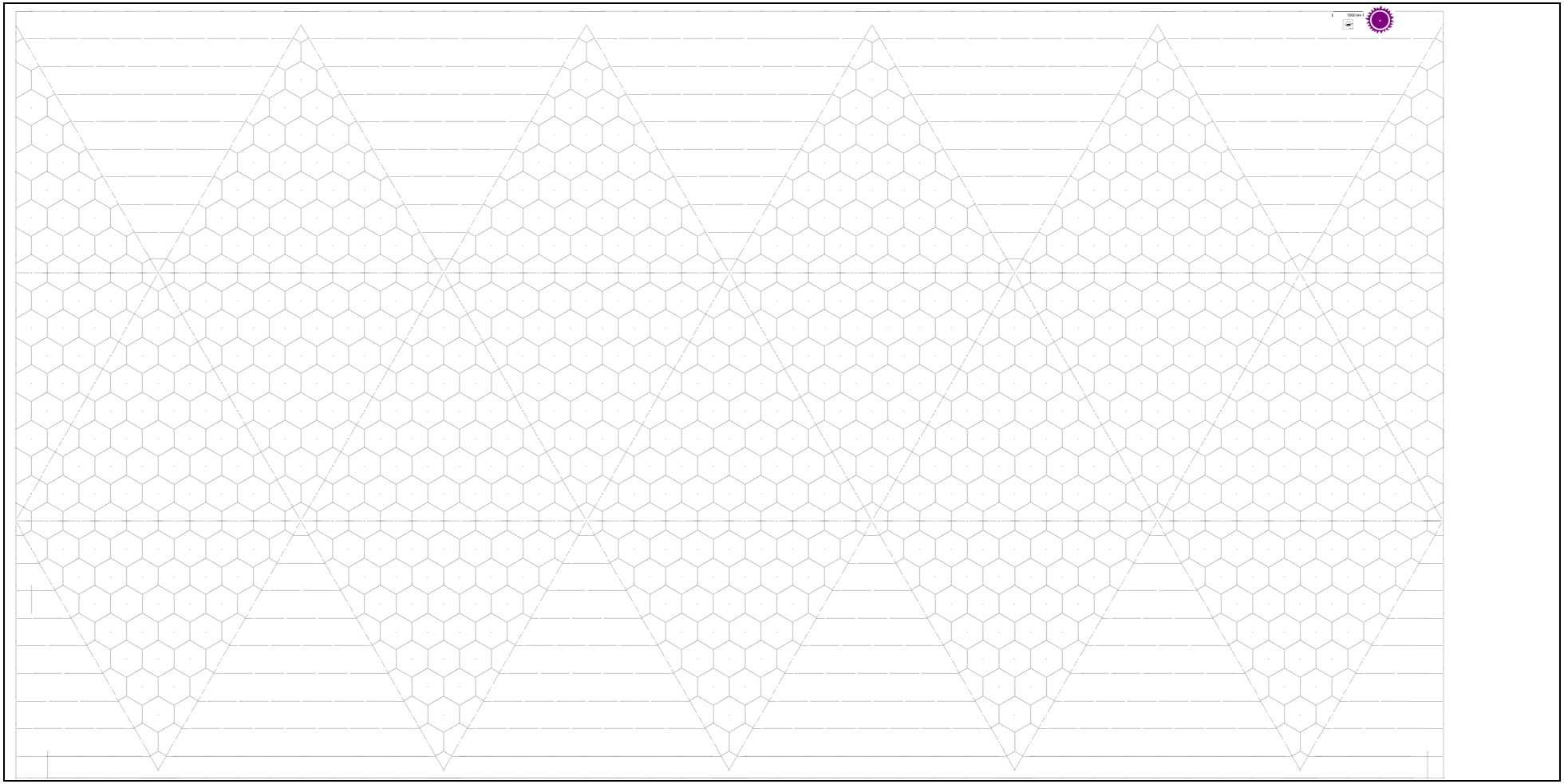

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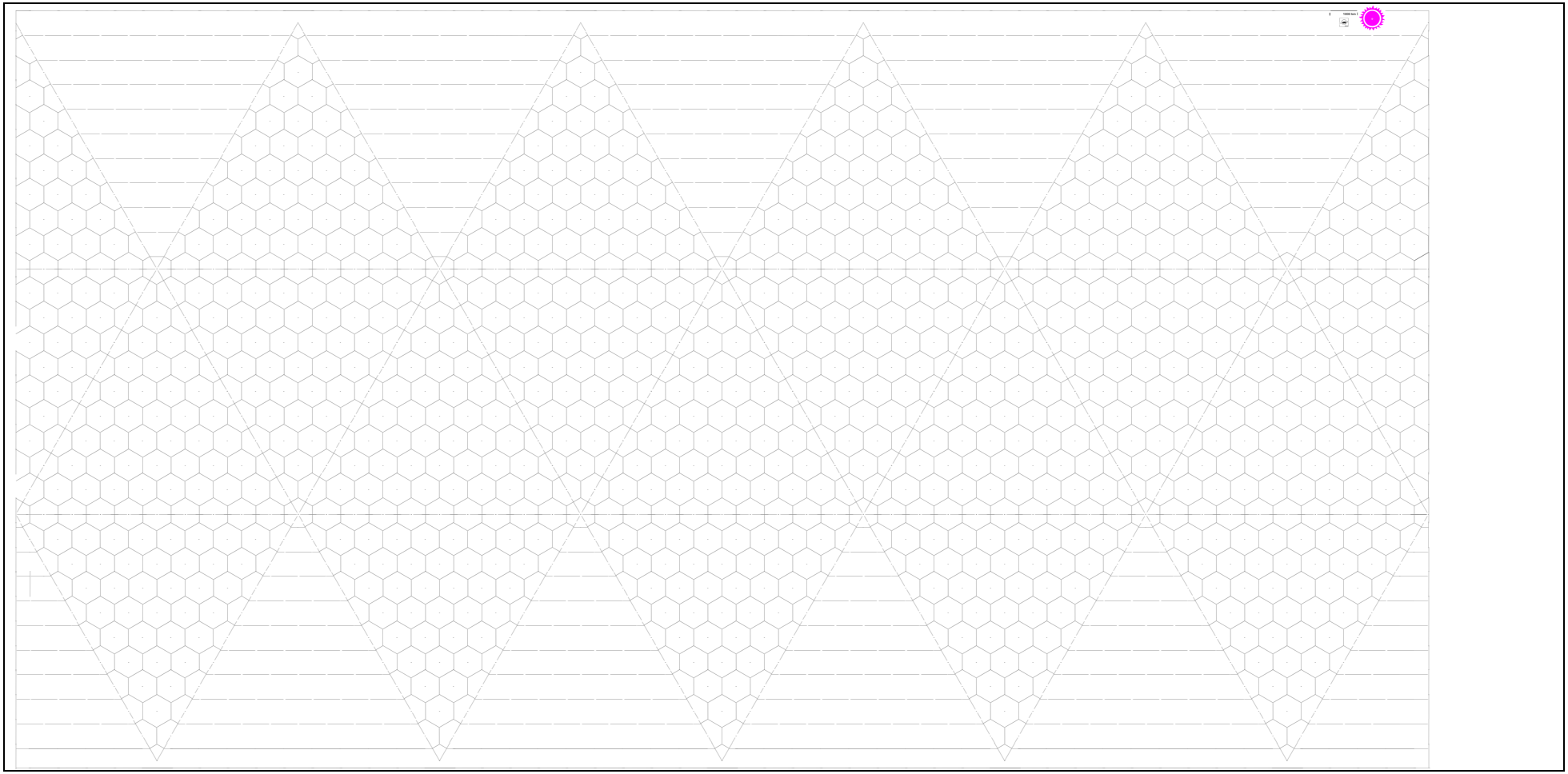

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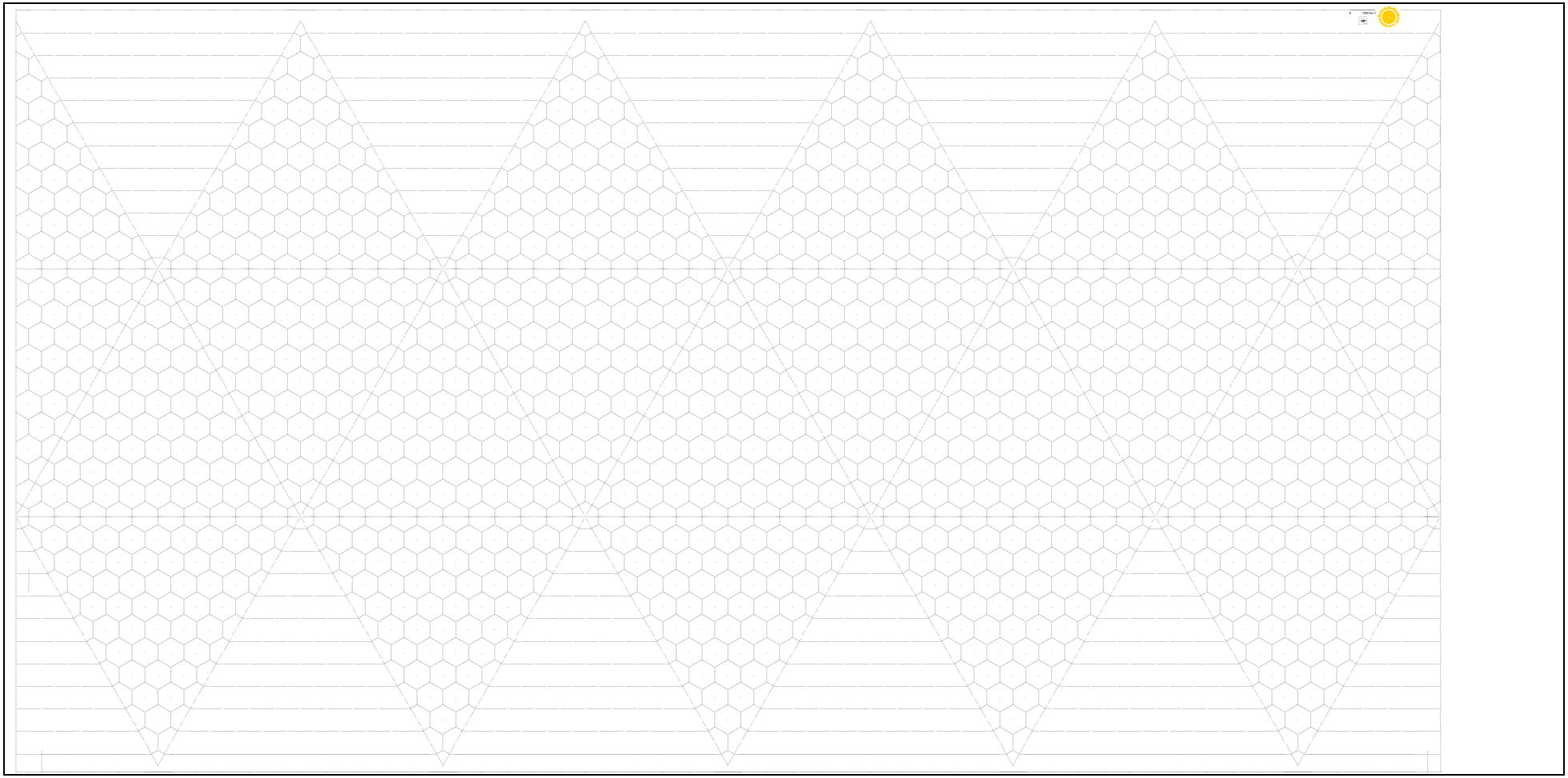

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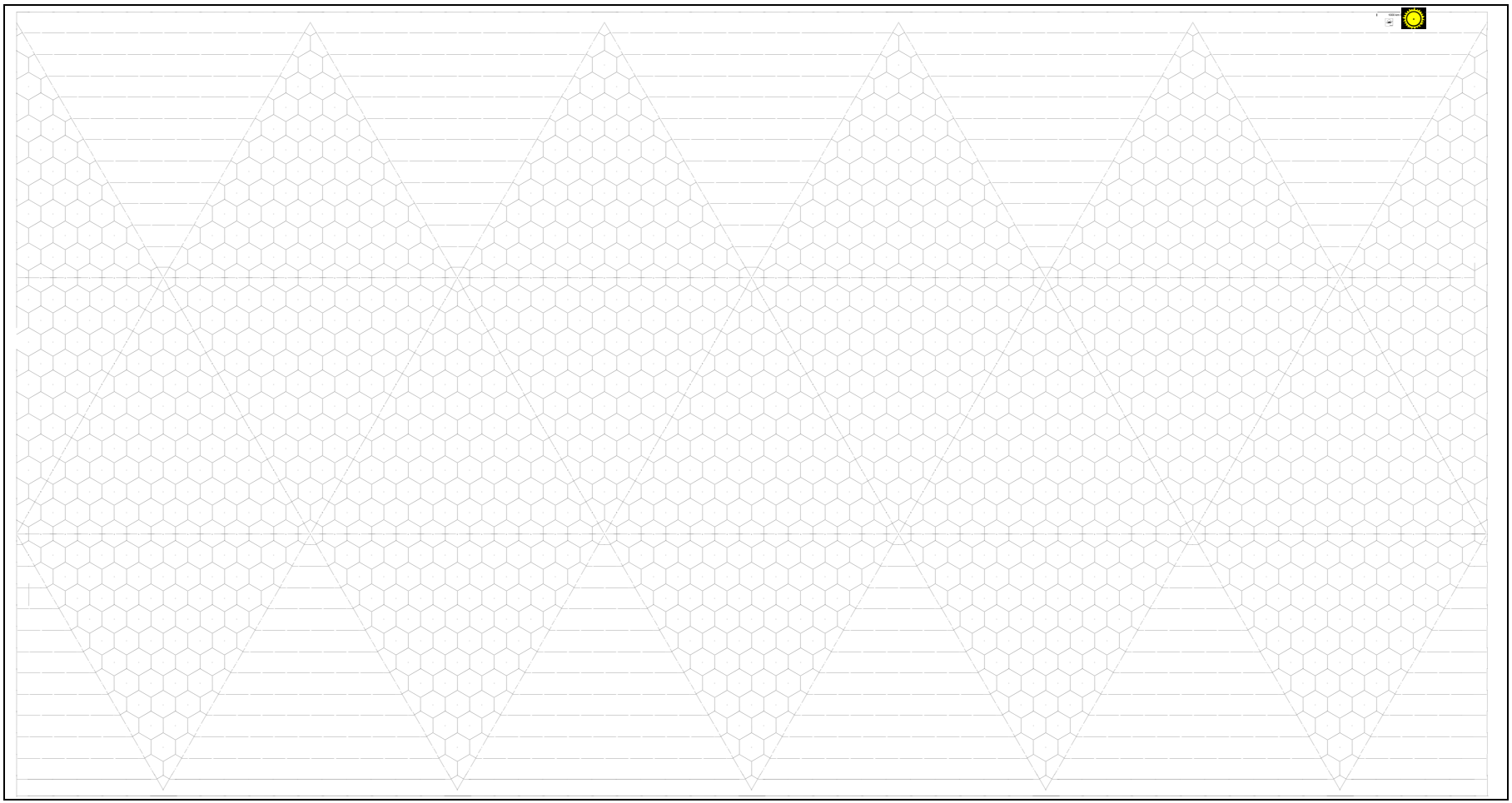

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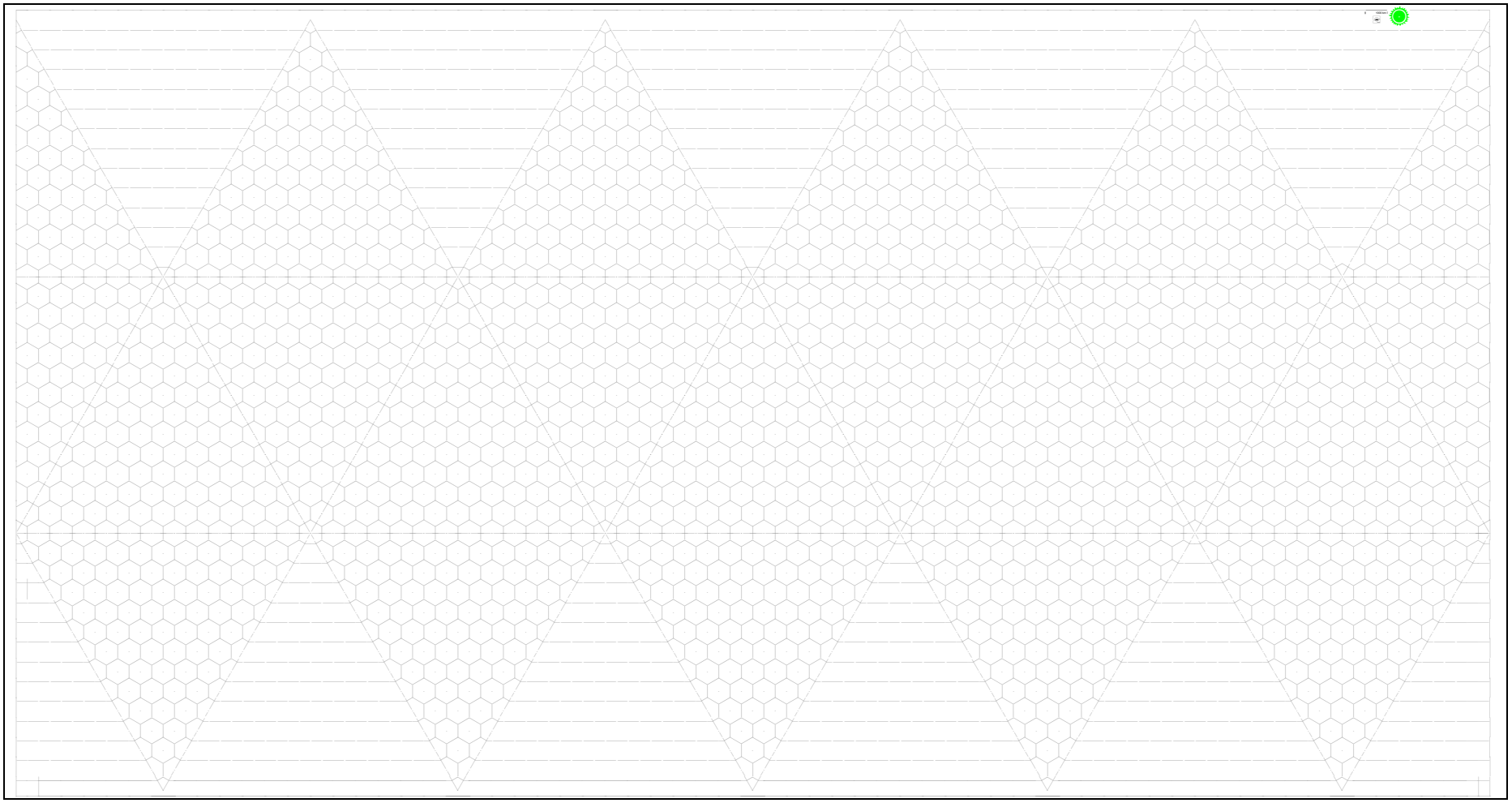

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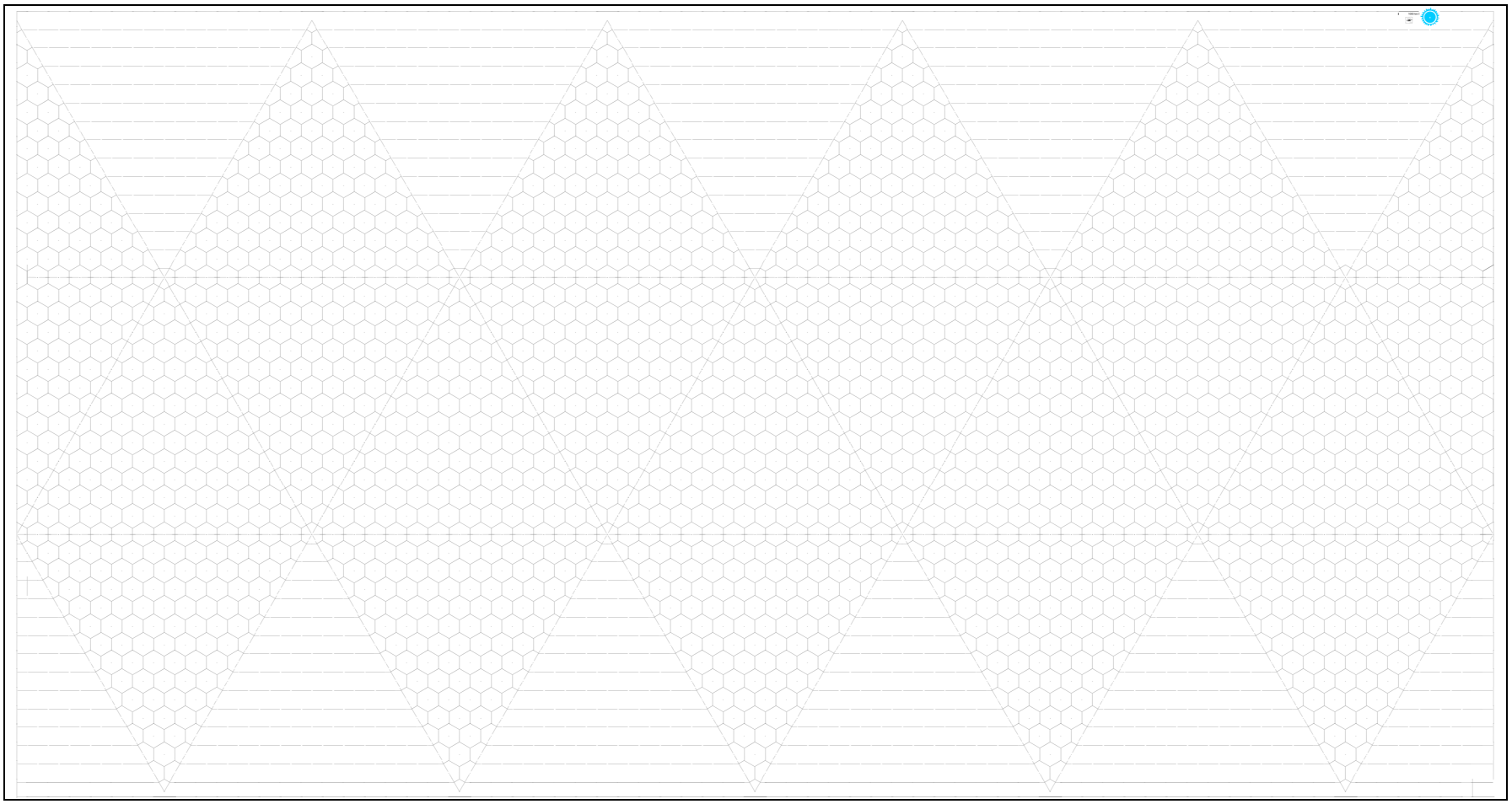

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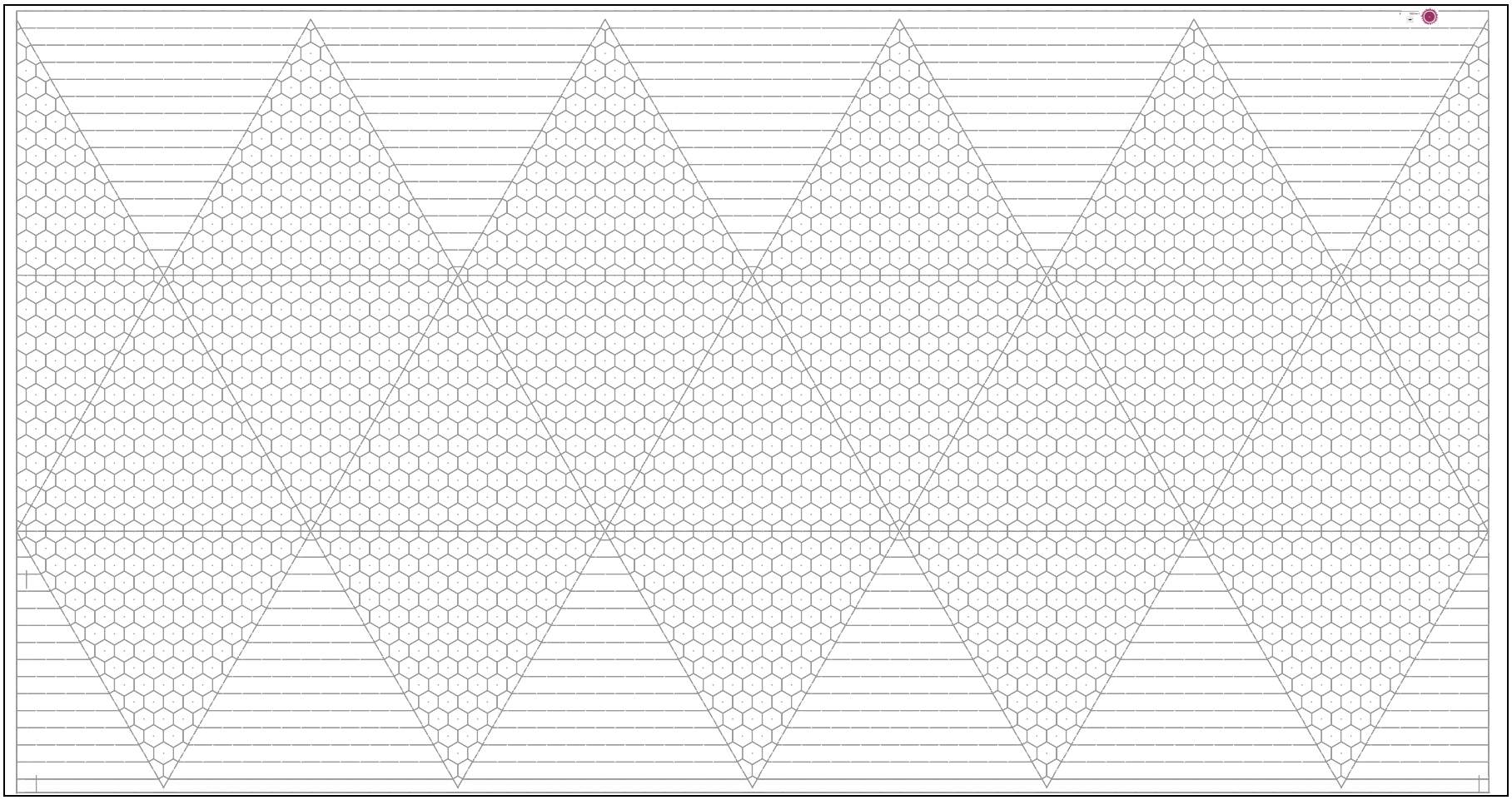


Technology

Tools are used to adapt, change, or control an environment. Tool-using cultures are groups of beings (not necessarily sophonts) with the ability to find or make tools. But, using tools is not enough:

Technology is the ability to use tools <u>to make other tools</u>.

When societies make the leap to using tools to make tools, they become technological. Technology builds on the successes of earlier tool-making experiences, and progresses to ever higher levels.

Many beings (not necessarily sophonts) make and use tools. Technological cultures make the leap to intelligence when they discover how to use tools to make other, more sophisticated, tools.

UNDERSTANDING TECHNOLOGY

Technology's value is three-fold:

A person using technology can do more (often much more) than a similar person not using technology. **Technology is a labor multiplier.**

A person using technology can achieve higher quality (often much higher) than a similar person not using technology. **Technology enhances quality.**

A person using technology can create objects or results which are impossible without the use of technology. **Technology can achieve impossibilities.**

Defining Tools

Tools are defined very broadly. They are the objects by which sophonts manipulate the universe.

A hammer is a tool for construction. A communicator is a tool for information exchange. A hazmat suit is a tool for safely handling hazardous materials.

Tools and Tools^2. Because technology is the use **of** tools to make tools, a special term is required: tools^2 (in place of the longer and more tedious term tool-making tools.)

Tools Shape Us. A technological society is shaped by the tools it makes and uses. A society with efficient biological tools becomes focused on biological structures and concentrates its research and output on biological machines.

DESCRIBING TECHNOLOGY

Technology is classified by Technological Level (or Tech Level, or TL): each TL represents a significant increase in the capabilities of the previous TL.

Powers of 10. Each TL represents a combined order of magnitude increase in capability (measured across the three measures of technology: labor enhancement, quality improvement, and achievement of impossibilities).

Technological Levels. Technological Levels are numbered on a theoretically open ended scale beginning with Zero and extending through 15 and higher. At much higher levels, technology becomes incomprehensible to much lower levels.

For example,

The Tech Level for an object is often appended to an object name. Rifle-5 is a tech level 5 firearm. Comm-10 is a tech level 10 communicator.

Tech Level is often used to describe a world or a society. Regina (the world) is TL-10. The Aslan Colonies which span the Great Rift are TL-12.

There Are Alternatives To Technology

There are non-technological activities which can achieve the results of technology. Social groups with poor access to tools (abyssal societies with limited access to fire; hydrogen societies with limited access to solid objects; those with clumsy manipulators; swimmers and aquatic cultures) may develop alternative or non-technological cultures.

Cultures. Some societies use Culture (the norms of behavior for a society) as a substitute for technology. A culture that expects higher labor output per individual, or greater attention to quality, or even spontaneous response to challenges is substituting cultural imperatives for technology.

Disciplines. Some individuals adopt disciplines which increase their efficiency or improve their output quality. Members of a martial arts discipline are more effective (efficient) because of their devotion to its principles.

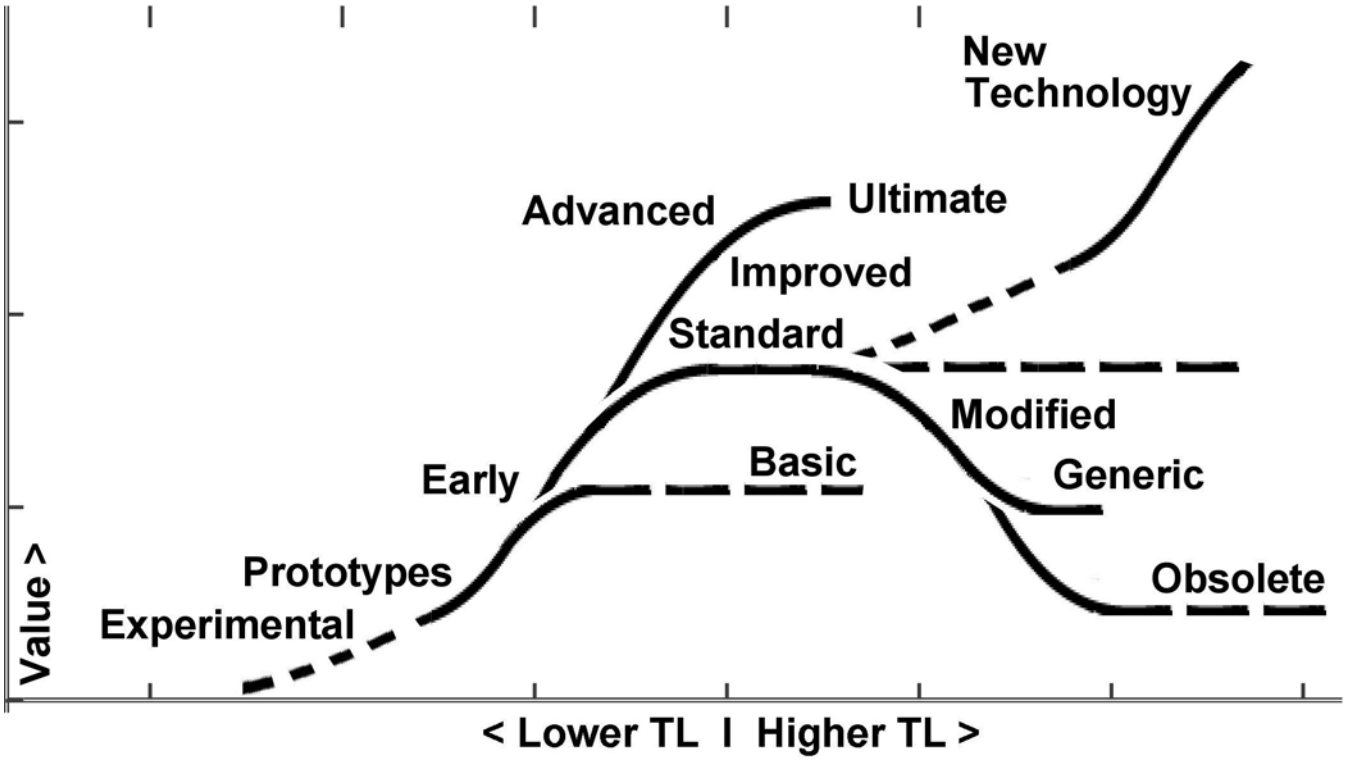
Geneering. Some species develop the ability to alter their own genetics. These altered individuals become tool-substitutes. The **Pseudo-Technological Hypothesis** remains unsettled: If a geneering culture creates a being (a tool) which can then create other and different geneered beings (other tools), does that meet the definition of technology?

Parasitism or Symbiosis. Some sophonts are themselves unable to use tools: they attach themselves to hosts (sophont tool users). The parasites themselves are not tool users, but may achieve the benefits of technology through their hosts.

Nevertheless

The vast majority of sophont cultures throughout the universe (90% of sophont cultures; 99% of sophont cultures reaching beyond their own homeworld) are technological.

TECHNOLOGICAL LEVEL STAGES



Tech Level Stages

A Tech Level shows devices that an industry with available tools can manufacture, maintain, and use. Tech Levels are an inexact approximation: they shade into earlier and later TLs. Such gradations are expressed as Stages. Tech Level Stages describe locations in the long term cycle of technological development. For example,

Experimental is handmade by inventors excited about the potential of a new technology, usually one-of-a-kind, and often dangerous and unreliable.

Prototype is the first step before early mass production. There are perhaps a dozen examples of any one prototype.

Early is the first mass-produced design, before the technology has been completely refined.

Basic is a cheaper, bulkier, less-featured version of the standard item.

Standard is the version with the expected features for the technology when it is mature and stable.

Alternate is a rethinking of the application of technology, often emphasizing different results or outputs.

Improved is the implementation of additional features.

Modified is a specialized version created in response to specific needs..

Generic is an equivalent to the standard version produced at lower cost using higher tech level manufacturing capabilities.

Advanced has significant capabilities added.

Ultimate implements significant improvements learned over the life cycle of the product. Beyond Ultimate is new technology.

UNDERSTANDING TL STAGES

Analyze a common type of device (a car, a rifle, an entertainment system, a communicator) by assigning it TL Stages and visualize precisely what each Stage means.

Stage	Device	Device
Experimental	Car	Rifle
Prototype	Car	Rifle
Early	Car	Rifle
Basic	Car	Rifle
Standard	Car	Rifle
Alternate	Car	Rifle
Improved	Car	Rifle
Modified	Car	Rifle
Generic	Car	Rifle
Advanced	Car	Rifle
Ultimate	Car	Rifle

TECH LEVEL STAGE EFFECTS

TL	Stage	Q	R	E	B	S	Comments
-2	Experimental	F	- 2	- 3	+3	- 3	One of a kind. Lesser capabilities. Much heavier. Very costly.
-1	Prototype	F	- 2	- 2	+2	- 2	One of very few. Lesser capabilities. Heavier. Costly.
-1	Early	F		- 1	+1	- 1	Lesser capabilities. Heavy. Costly.
0	Standard	F					Typical of available models.
0	Basic	F			+1		Heavier. Cheaper.
+1	Alternate	F					Some different capabilities.
+1	Improved	F	+2	+2			Some improved capabilities. Greater Ease of Use.
+2	Modified	F		+1		+1	Lighter.
+2	Generic	F					Functionally equivalent to Standard, but cheaper.
+3	Advanced	F	+2	+2	- 2	+2	Lighter. Added capabilities.
+4	Ultimate	F	+2	+3	- 2	+3	Lighter. Most effective. Costlier.

F= Flux (the value may vary depending on the manufacturer).

DECIMAL TECH LEVELS

Any Tech Level can be subdivided into decimal sublevels to highlight or rank differences.

Historical Differences. Decimal Tech Levels allows a greater understanding of the historical relationships between devices. Tech Level 1 is filled with inventions and decimal levels help rank them.

Situational Differences. Objects within a TL may differ in their sophistication. Detailed comparisons of objects at a specific TL may call for decimal levels. Some Stages of objects represent differences of less than a full TL and decimal levels may be appropriate.

LEAPS IN TECHNOLOGY

The steady increase in Technological Levels is punctuated by occasional Leaps: major advances that introduce new concepts. The effects of such leaps are felt for many levels to follow.

TL-1. Using Tools To Make Tools. By far, the greatest technological leap is the first one: the increase from TL-0 to TL-1. The culture, which already uses simple tools (rocks; clubs) discovers the ability to use them to make other, more sophisticated tools.

TL-4. Division of Labor and Mass Production. The invention (or the discovery) of division of labor and mass production marks the transition from individual craftsmen to relatively unskilled labor. Objects show a significant increase in labor efficiency and an increase in quality.

TL-7. Processors. The widespread availability of information processors and integrated electronic circuits makes possible sophisticated devices which supplant tedious sophont thought processes.

TL-10. Gravity Manipulation. The development of practical gravity manipulation and its associated transportation systems revolutionize travel and the movement of goods.

TL-13. Effective Biological Sciences. Cloning, supplemented by forced-growth processes, makes geneering possible.

TL-16. Artificial Persons. The widespread availability of artificial persons, including practical robots, artificial intelligence in computers, and self-aware mechanisms replaces sophonts in most non-creative activities.

TL-19. Matter Transport. The availability of elemental matter portals (transporting raw materials across Au distances efficiently) transforms concepts of physical value.

TL-22. Individual Transformations. The lines between individuals blur as bodies become customizable, replaceable, and disposable.

TL-25. Psionic Engineering. Technological tools based on psionic principles revolutionize communications and manufacturing.

TL-28. Stellar Scale Physical Manipulation. Technology develops capabilities to manipulate worlds and stars.

TL-31. Pocket Universes. The ability to create and manipulate pocket universes infinitely expands available resources and turns all but the most adventurous inward. Includes reality manipulation.

TL-33. The Technological Singularity.

AN INEXACT PROGRESSION

The Technological Scale ranks technology; it does not define how far a society will go, or how fast it will progress.

Technological progress is often (as here) presented as a linear sequence: a steady progression from TL-5 to TL-6 to TL-7.

The reality is far more complex:

Societies Are Contaminated By Other Technologies.

Unless a society develops in true isolation, it absorbs other technologies as it encounters them. There is no **Prime Directive**: no external rules that protects developing technologies from interference. Individuals and companies are free to sell technology to any markets that will buy it.

The result is that societies have a wide range of available technologies: imported devices, local adaptations, crude imitations, and even local alternatives. Once a society knows something is possible (because a visiting star captain had a working device), it can attempt to duplicate it.

Not All Technological Societies Advance

Technology does not mandate advancement. Societies may adopt enough technology to meet their needs and then be content with stability.

A culture which values reproduction (at a non-conscious, genetic level) may discover technological means of enhancing reproduction, leading to overpopulation leading to societal and technological collapse.

A pleasure-seeking culture may advance in some areas but ignore technology which does not advance its pursuit of hedonism.

Some cultures value social stability: technology that disrupts society may be banned or suppressed.

Not All Technological Societies Survive

Technology does not mandate survival. A society may faces challenges which overwhelm its tech level. Or technology may itself destroy a society.

Plague or disaster can wipe out a society whose Technological level is insufficiently advanced.

A violent culture may discover nuclear weapons and destroy itself (or follow cycles of development and regression).

An irresponsible culture may adopt nuclear power without sufficient safeguards, or genetic modifications or industrialization without considering the long-range consequences.

Not All Technological Societies Prosper

Technology does not guarantee prosperity or quality of life.

An oppressive society may depend on technology to maintain its domination of the population.

A culture may concentrate its technology (for reasons incomprehensible outside of that culture) in areas other than the general welfare: in strange or useless or peripheral activities that do not improve or advance society in general.

THE PARADIGM SHIFTS

There are a very few significant technological advancements that most societies never discover. These **paradigm shifts** are concepts that require such a profound change in basic understandings of principles that they are discovered only phenomenal genius, or phenomenal luck.

The total number of possible paradigm shifts is unknown but probably very small. Three known examples are:

Jump Drive. Jump Drive technology enables a ship to transition into Jump Space and emerge some great distance away within a reasonable time, effectively multiples of 170 times the speed of light.

Jump drive makes interstellar flight practical.

Fusion Plus. Fusion Plus (or cold fusion or Fusion+ or F+) produces an efficient (very little waste heat) energy output through catalyzed fusion of hydrogen.

Cold fusion disconnects ordinary activity from the cost of energy.

Cold fusion is distinguished from Fusion by its small size: Fusion is suitable for large multi-kiloton installations; Fusion Plus is a small, relatively portable installation suitable for vehicles and homes.

Reality Manipulation. Reality engineering allows editing of reality on a real-time basis: manipulation of physical laws, and revision or reversal of event flow.

The Favored Society Effect. A very few (one in a thouand) societies independently make a paradigm shift at the proper time to discover one of the crucial technological advances. These favored, fortunate societies gain in two ways: they have an important technological principle that gives them power over their less fortunate neighbors, and the discovery imparts to their collective self-image a level of confidence or self-esteem that makes them to a dominant position in interstellar society.

For example, the discovery of Jump Drive by the Vilani (at a time when all of its neighbors were using NAFAL Not-As-Fast-As-Light drives) gave them a technological advantage and reinforced their own self-image as the natural rulers of interstellar space. They used their discovery to found an empire that lasted five thousand years.

The Favored Society Effect Inverse. Many societies send out expeditions to the stars and find the universe is already settled. Some societies are visited by starfarers bringing new technology and the implied message that the stars are home to better, stronger, superior cultures. Most such societies retreat to their own territories, content to rule their homeworld and focus inward.

When the Kisthdra first ventured beyond their system in NAFAL ships, the crews returned home aboard Vilani starliners. The realization that the stars had already been conquered, and belonged to someone else, crushed the collective spirit of Kisthdra society: they rarely venture beyond their world even now.

The result is interstellar domination by a favored few sophonts, and many worlds each home to a unique race and its own introspective interests.

THE TECHNOLOGICAL SINGULARITY

Technology builds on technology. Each Tech Level is built on the previous ones.

Technological knowledge increases exponentially. Each Tech Level represents an expanding body of knowledge: many of the advances increase the rate at which new advances can be made.

Technological progress accelerates. The time between technological levels decreases, assuming a large population working on technology sufficient resources being devoted to it, and assuming the cultures involved care about advancing technology.

There Is A Maximum

Ultimately, the tool-making tools of technology surpass the capabilities of the sophonts who use them. Computers may surpass sophonts in intelligence, and more importantly, in sophont-like insights. Computer interfaces may raise the abilities of sophonts to new levels. Geneering and medical science may increase the intelligence and talents of sophonts to a degree that accelerates technological advance.

TL-Z =
The Technological Singularity=
TL-33

The Technological Singularity. There is an endpoint in the TL scale where tools become self-replicating, self-improving, and panscient (all skillful). With these features in place, technology becomes meaningless and is no longer an applicable term.

At the Technological Singularity, everything is possible: tools^2 respond to virtually all needs without discernible delay.

For example, as a society advances beyond TL-24 and approaches TL-Z, technology provides everything, in high quality, on demand, to everyone in the society. Robots or sophontoids do all the work; artificial intelligences manage all of society's systems; individuals can choose any number of entertainments or challenges, learn or access most of the knowledge of the universe, do anything, experience anything, do anything, and all without risk, and strangely enough, without challenge of reward. At that point, sophonts must either grow, or die. Various societies choose various options, but in every circumstance:

The Technological Singularity is Unstable. The features and the abilities of the Technological Singularity promote any number of consequences, all of which lead to changes that end the Technological Singularity.

Some consequences are:

; Society transcends technology advancing to metaphysical pursuits which transcend the physical plane.

; Society retreats to a simple, non-technological pastoral existence.

; Society collapses from the strain. It loses its high tech tools and begins the cycle of technological development again.

; Society fragments; some factions transcend; others retreat; still others struggle to maintain or reacquire the TS.

The Single Example of a Technological Singularity

History recognizes one period in which the Technological Singularity was approached (if not actually achieved).

Insert your guess here. _____.

The March of Technology-1

Technological Levels define the point in the technology continuum where specific objects can commonly be produced.

TL

Energy, Society, Environ, Comm

		Era	Energy	Society	Environments	Communications
	0	Primitive. Stone Age.	Personal Effort. Fire.	Tribe. Clan.	Natural. Crude Shelters.	Personal Senses. Messengers.
Vlow Tech	**1**	Bronze Age 3500 BC	Water Power	Ethnic Groups	Settlements Villages	Memorization.
	1.3	Iron Age 1300 BC			Towns Roads, Canals	Writing
	1.6	Middle Ages 600 AD		Kingdoms	Cities	
	2	The Age of Sail 1500 AD	Wind. Sail.	Nations		Printing
	3	Industrial Revolution 1700 AD	Coal. Steam.	Democracies		
	3.3	1800				
	3.6	1850				Code By Wire.
Low Tech	**4**	Mechanization 1900 AD	Electricity		Skyscrapers	Sound by Wire. Image Capture.
	5	1930 AD	Petrochemicals.	Dictators		Broadcast Sound. Sound Recording.
	6	Nuclear Age 1950 AD	Nuclear Fission.	Political Superpowers		Broadcast Images. Video Recording.
Mid tech	**7**	1975 AD	Geothermal. Solar.			
	8	2000 AD	Renewables.			Personal Comms
	9	2020 AD	Early Fusion.		Arcologies	3D Images and Video
High Tech	**10**	2100 AD	Practical Fusion	World Communities		
	11	Imperial Average Circa Year Zero	[FusionPlus]			
	12					
VhighTech	**13**	Imperial Maximum Circa 550		Robots		CommPlus
	14					
	15	Imperial Maximum Circa 1107				
Xhigh Tech	**16**	Darrian Maximum	Anti-Matter	Artificial Persons. The Under Society.		
	17					
	18		Collector			
Uhigh Tech	**19**					
	20					Matter Transport
	21				Scattered Site Dwellings	

The March of Technology-2

Technological Levels define the point in the technology continuum where specific objects can commonly be produced.

TL

Transport, Medicine, Science, Computers

		Era	Transportation	Medical	Science	Computers
	0	Primitive. Stone Age.	Walking	Herbal Medicine Mystical Therapy		Counting
Vlow Tech	**1**	Bronze Age 3500 BC	Beasts of Burden	Basic Diagnosis.		Abacus. Quipu.
	1.3	Iron Age 1300 BC	Wheel			
	1.6	Middle Ages 600 AD	Galleys			
	2	The Age of Sail 1500 AD	Sailing Ships	Internal Anatomy.		Algebra
	3	Industrial Revolution 1700 AD		Crude Surgery.	Mechanics	Calculus
	3.3	1800	Steamships			
	3.6	1850	Railroads			
Low Tech	**4**	Mechanization 1900 AD		Antiseptics. Anesthetics.	Medical	Analog Computers
	5	1930 AD	GroundCars	Internal Imaging.	Polymers	Electric Calculators
	6	Nuclear Age 1950 AD			Electronics	Model /1
Mid tech	**7**	1975 AD	Rockets to Orbit	Organ Transplants. Slow Drug.	Programmer	Model /2
	8	2000 AD			Photonics	
	9	2020 AD	NAFAL	Cryogenics Fast Drug.	Gravitics	Model /3
High Tech	**10**	2100 AD	Gravity Manipulation Lifters. G-Drive.	Anti-Virals	Fluidics	Model /4
	11				Magnetics	Semi-Organic Brains Model /5
	12			Antigeriatrics		Positronic Brains, Model /6
VhighTech	**13**			Effective Cloning. Forced Growth	Biologics	Wafer Technology Model /7
	14			Geneering		Self-Aware Electronic Model /8
	15			Anagathics.		Model/9
Xhigh Tech	**16**					True Artificial Intelligence
	17					
	18					
Uhigh Tech	**19**		Elemental Matter Transport			
	20		Global Matter Transport			
	21		System Matter Transport			

The March of Technology-3

Weapons are further described by burden (size or bulk), stage (technological sophistication), user (human or other), and portability.

TL
Speed,
Weapons, Artillery

		Era	Speed1		Speed2	Weapons	Heavy Weapons
	0	Primitive. Stone Age.	Walking	**1**	5 kph	Clubs. Rocks.	
Vlow Tech	**1**	Bronze Age 3500 BC	Beasts of Burden	**2**	10 kph	Blades. Spears.	
Vlow Tech	**1.3**	Iron Age 1300 BC	Wheel				Massive Armies
Vlow Tech	**1.6**	Middle Ages 600 AD	Galleys	**3**	20 kph		Siege Weapons
Vlow Tech	**2**	The Age of Sail 1500 AD	Sailing Ships	**4**	30 kph		
Vlow Tech	**3**	Industrial Revolution 1700 AD				Musket	Cannon
Vlow Tech	**3.3**	1800	Steamships	**5**	50 kph		
Vlow Tech	**3.6**	1850	Railroads	**6**	100 kph		
Low Tech	**4**	Mechanization 1900 AD				Revolver	
Low Tech	**5**	1930 AD	GroundCars	**7**	300 kph	Rifle. MachineGun.	
Low Tech	**6**	Nuclear Age 1950 AD		**8**	500 kph		
Mid tech	**7**	1975 AD	Rockets to Orbit	**9**	700 kph		
Mid tech	**8**	2000 AD		**10**	1000 kph		
Mid tech	**9**	2020 AD	Civil SST	**11**	2000 kph		
High Tech	**10**	2100 AD	Civil Space Transport	**12**	3000 kph		
High Tech	**11**						
High Tech	**12**						
VhighTech	**13**						
VhighTech	**14**					Psi-Shield	
VhighTech	**15**						Black Globes
Xhigh Tech	**16**						SR Tractors
Xhigh Tech	**17**					Fusion Rifle	
Xhigh Tech	**18**					Personal Damper	LR Tractors
Uhigh Tech	**19**		Elemental Matter Transport			Disintegrator Pistol	
Uhigh Tech	**20**		Global Matter Transport			Disintegrator Wand	
Uhigh Tech	**21**		System Matter Transport			Relativity Rifle	

The March of Technology-4

Technological Levels define the point in the technology continuum where specific objects can commonly be produced.

TL
Energy, Society, Environ, Comm

		Era	Space Travel	Power Plants	Technologies	Armor
	0	Primitive. Stone Age.	Stargazing			
Vlow Tech	1	Bronze Age 3500 BC				
	1.3	Iron Age 1300 BC				
	1.6	Middle Ages 600 AD				
	2	The Age of Sail 1500 AD	Navigation			
	3	Industrial Revolution 1700 AD				
	3.3	1800				
	3.6	1850				
Low Tech	4	Mechanization 1900 AD				
	5	1930 AD			Electronics	
	6	Nuclear Age 1950 AD				
Mid tech	7	1975 AD			Programmer	
	8	2000 AD		[OverClock Rates]	Photonics	
	9	2020 AD	Maneuver-1 Jump-1 possible	PP-2 OC= 20	Fluidics	
High Tech	10	2100 AD		PP-3 OC= 40	Gravitics	
	11	Imperial Average Circa Year Zero	Jump-2	PP-4 OC= 60	Magnetics	
	12		Jump-3	PP-5 OC= 90		
VhighTech	13	Imperial Maximum Circa 550	Jump-4	PP-6 OC= 100	Biologics	
	14		Jump-5	PP-7 OC= 110		
	15	Imperial Maximum Circa 1107	Jump-6	PP-8 OC=120		
Xhigh Tech	16	Darrian Maximum		PP-9 OC=130		
	17		[Jump- 7]	OC=140		
	18			OC=150		
Uhigh Tech	19		[Jump- 8]	OC=160		
	20			OC=170		
	21		[Jump -9]	OC=180		

Overclock Rates are historical.

Extreme Technology

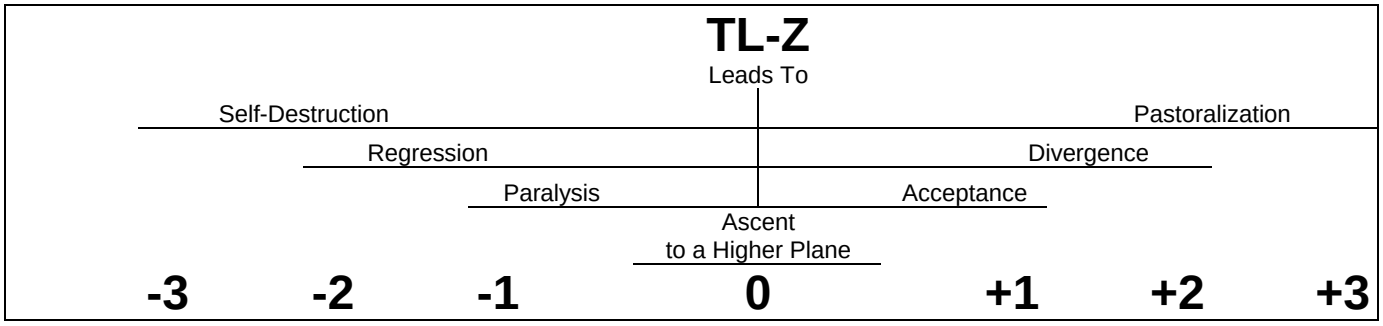
Technological Levels define the point in the technology continuum where specific objects can commonly be produced.

TL
Extremes

	Flux=	- 5	- 4	- 3	- 2	- 1	0	+1	+2	+3	+4	+5
	Pts=	- 2		- 1		0			+1		+2	
22				Individual Transformations.								
23		Grey Goo		Mythical “Hop” Drive					Rosettes		Practical PsychoHistory	
24		Planetbuster Bombs				Many Capsule Dyson Sphere			Portals			
25				Inertialess Maneuver					Psionic Engineering		Rapid Terraforming	
26		World Scale Physical Constructs				Socieneering			Rumored “Skip” Drive			
27				Group Personalities		Ring Worlds						
28												
29		Reality Manipulation				Rigid Dyson Spheres					Reality Manipulation	
30		Implantable Ethics		Stellar Scale Physical Constructs							Implantable Ethics	
31				Pocket Universes								
32												
Z		----- The Technological Singularity -----										

Levels above 21 are called Accelerating Tech Levels: each is of short duration and each leads at an accelerating pace to the next. The technology addressed by TLs above 21 is frighteningly powerful and susceptible to misuse or disaster.

Which Way? As a society progresses to each new Tech Level, Flux determines the focus technology column for the Level (although the other technology also becomes available). When the society reaches TL-Z, the sum of the Points for that technology is a DM on a single Societal Flux for Destiny.



0. Ascent To A Higher Plane. Society as a whole transcends its position as a tool making and tool using culture and progresses to a non-material existence, leaving behind ruins or relics of its former existence.

+3 or more. Pastoralization. Society transcends its dependence on, or focus on, increases in technology. The majority of society embraces a pastoral existence emphasizing social and familial relationships. There may be some level of (sophisticated, self-maintaining) technology operating in the background.

+2. Divergence. Society diverges along several paths (roll flux 3 times for the different paths).

+1. Acceptance. Society accepts some or all of its technological foundation and settles into a comfortable existence using what technology it has.

- 1. Paralysis. Society is overwhelmed by the power of its technology and is frightened into a period of inaction.

- 2. Regression. Society is overwhelmed by the power of its technology; factions within society fight for ascendancy and in the process create widespread destruction.

- 3 or less. Self-Destruction. Society is overwhelmed by the power of its technology, factions within society fight for ascendancy and in the process destroy society completely.

Extreme Technology

Extremes of technology are indeed extreme: "Any technology is magic to those who do not understand it."

TL
Extreme

Individual Transformations. The ability to change physical capabilities of individual sophonts, including enhanced characteristics, alternate bodies, and the ability to change between those alternatives.

Grey Goo. Self-replicating nano capable of reducing objects (people, cities, living matter, worlds) to a disorganized froth.

Mythical "Hop" Drive. Interstellar drive alternative to the Jump Drive. Ideally of greater range, greater fuel efficiency, and higher effective speed.

Rumored "Skip" Drive. Interstellar drive alternative to the Jump Drive. Ideally of greater range, greater fuel efficiency, and higher effective speed.

Rosettes. A gravitational system of a heavier and lighter bodies orbiting in a regular repeating pattern around a common barycenter. The mechanics of creating a Rosette are the first step in the process of creating Dyson Worlds.

Practical PsychoHistory. The ability to make exact predictions of the social behavior of large groups of sophonts, and based on those predictions to shape the course of future history.

Planetbuster Bombs. The ability to create devices which will destroy worlds. The term Planetbuster assumes actual fragmentation of worlds; alternative technologies include Nova Bombs capable of exploding stars, "scrubbing" world surfaces with kinetic impacts or nuclear fire, and anti-atmosphere weapons which merely destroy the life-sustaining aspects of the world.

Many Capsule Dyson Sphere. A system of multiple worldlets (capsules) dedicated to capturing the energy of a central star in support of the power needs of the local population.

Portals. The ability to create portals: instantaneous connections between distant locations.

Inertialess Maneuver. The ability to eliminate inertia in spacecraft. Inertialess ships are unrestricted by velocity vectors and achieve very high speeds nearly instantaneously. When intertialessness is turned off, the ship reverts to its previous state of inertia.

Psionic Engineering. The ability to manipulate matter (at all scales from the sub-atomic to the macro) without physical interaction: the psionic engineer "encourages" matter to move and interact to accomplish the desired results. Psionic engineering is a prerequisite to many large scale physical constructs.

World Scale Physical Constructs. The ability to manipulate the non-stellar elements of a star system. World scale physical constructs includes the ability to create worlds (star mining the matter required) within reasonable time frames (typically less than a sophont adulthood).

Rapid Terraforming. The ability to manipulate the characteristic elements of a world. Rapid Terraforming includes the ability to restructure existing worlds, change their orbits, and change their atmospheric and surface details to conform to some desired standard, all within a reasonable timeframe somewhat less than a sophont adulthood. The term Terraforming includes any world specification (not just Terra-like).

Group Personalities. The ability to blend distinct personalities into one master personality (temporarily or permanently). Group personalities reflect a variety of experiences and abilities for greater efficiency, creativity, and responsibility.

Ring Worlds. The ability to create a solid habitable ring around a central star.

Engineered Societies. The ability to create a social and cultural structure based on created specifications. Just as Geneering manipulates genetic structure, Socieneering manipulates social and cultural structure to improve efficiencies, reflect desired values, and propagate them throughout society.

Reality Manipulation. The ability to edit reality, primarily through redos: limited restrospective changes to past event to alter their effects on the present.

Rigid Dyson Spheres. The ability to create a solid shell surrounding a central star. The shell provides vast land surface area and efficiently captures the energy output of the star.

Implantable Ethics. The ability to define right conduct and to implant its constraints on individuals.

Stellar Scale Physical Constructs. The ability to manipulate the elements of a star system, including the star itself. Stellar scale physical constructs includes the ability to create stars and their associated worlds within reasonable time frames (typically less than a sophont adulthood).

Pocket Universes. The ability to create very small parallel universes (small in a relative sense) containing isolated star systems and accessible from the true universe through a variety of portals.

Rate of Technology Advance

Technology advances at various rates based on the society and culture of the world. This rate is rarely constant, and is punctuated by wars, foreign intrusions and contacts.

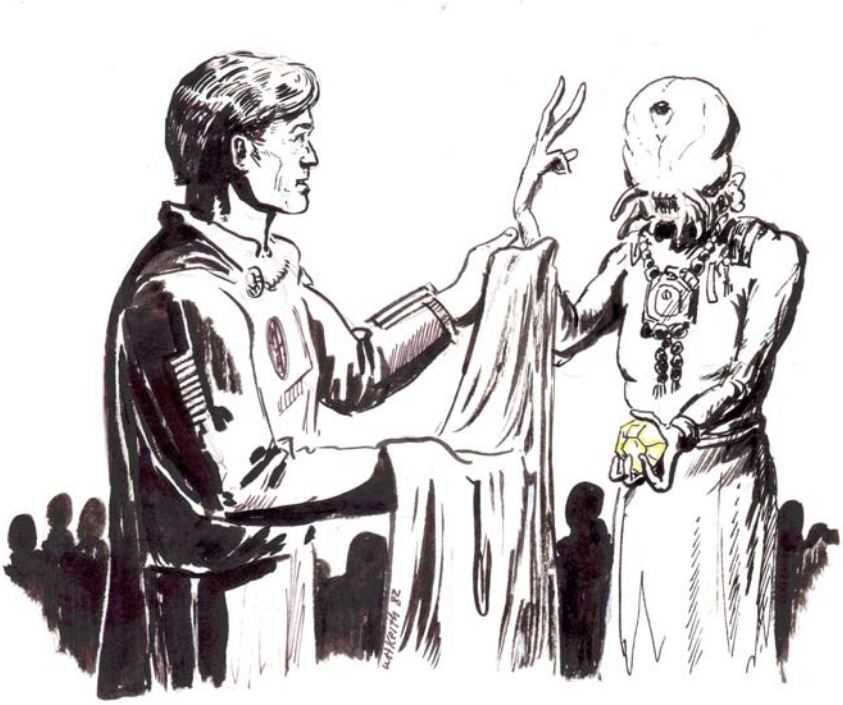
TL
Rate Of Advance

		Era	Lethargic	Average	Fast	Historical (Earth)
	0	Primitive. Stone Age.				0
Vlow Tech	**1**	Bronze Age 3500 BC	1D x 10,000 y	1D x 5,000 y	1D x 2,000 y	10,000 y
Vlow Tech	**2**	The Age of Sail 1500 AD	1D x 10,000 y	1D x 2,000 y	1D x 1,000 y	5000 y
Vlow Tech	**3**	Industrial Revolution 1700 AD	1D x 5,000 y	1D x 1,000 y	1D x 500 y	250 y
Low Tech	**4**	Mechanization 1900 AD	1D x 5,000 y	1D x 500 y	1D x 500 y	200 y
Low Tech	**5**	1925 AD	1D x 2,000 y	1D x 200 y	1D x 50 y	25 y
Low Tech	**6**	Nuclear Age 1950 AD	1D x 1,000 y	1D x 100 y	1D x 50 y	25 y
Mid tech	**7**	1975 AD	1D x 5,000 y	1D x 500 y	1D x 50 y	25 y
Mid tech	**8**	2000 AD	1D x 2,000 y	1D x 200 y	1D x 50 y	25 y
Mid tech	**9**	2025 AD	1D x 1,000 y	1D x 100 y	1D x 50 y	25 y
High Tech	**10**	2125 AD	1D x 5,000 y	1D x 500 y	1D x 200 y	
High Tech	**11**	Imperial Average Circa Year Zero	1D x 2,000 y	1D x 200 y	1D x 100 y	
High Tech	**12**		1D x 1,000 y	1D x 100 y	1D x 50 y	
VhighTech	**13**	Imperial Maximum Circa 550	1D x 5,000 y	1D x 100 y	1D x 200 y	
VhighTech	**14**		1D x 2,000 y	1D x 100 y	1D x 100 y	
VhighTech	**15**	Imperial Maximum Circa 1107	1D x 1,000 y	1D x 100 y	1D x 50 y	
Xhigh Tech	**16**	Darrian Maximum	1D x 5,000 y	1D x 500 y	1D x 200 y	
Xhigh Tech	**17**		1D x 2,000 y	1D x 200 y	1D x 100 y	
Xhigh Tech	**18**		1D x 1,000 y	1D x 100 y	1D x 50 y	
Uhigh Tech	**19**		1D x 5,000 y	1D x 500 y	1D x 200 y	
Uhigh Tech	**20**		1D x 2,000 y	1D x 200 y	1D x 100 y	
Uhigh Tech	**21**		1D x 1,000 y	1D x 100 y	1D x 50 y	
	22-23-24		1D x 50 y	1D x 30 y	1D x 20 y	
	25-26-27		1D x 30 y	1D x 20 y	1D x 10 y	
	28-29-30		1D x 20 y	1D x 10 y	1D x 5 y	
	31-32-33		1D x 10 y	1D x 5 y	1D x 1 y	

Shown is expected time to the next TL, in years. If the die roll is 6, reduce TL one level and shift one column to the left. If the die roll is 1, reduce the period by half and shift one column to the right.

The Traders' Guild

Laws of Trade



1

The First Law of Trade:

Buy Low, Sell High

2

The Second Law of Trade

Don't Ship Air

3

The Third Law of Trade

Reward Does Not Come Without Risk

Valuable Benefits for Traders' Guild Members:

The Trade Route Data Pool
Discounted Life Insurance Program
Up-To-Date World Reports
TAS Accommodations Discount

Post In Crew Employee Common Area

Traders' Guild Local 3D5A, Regina. 114-1004

Trade and Commerce Between The Stars

Interstellar trade is the transport of commercial goods from one world to another in the pursuit of profit. Successful traders obey the ancient First Law of Trade:

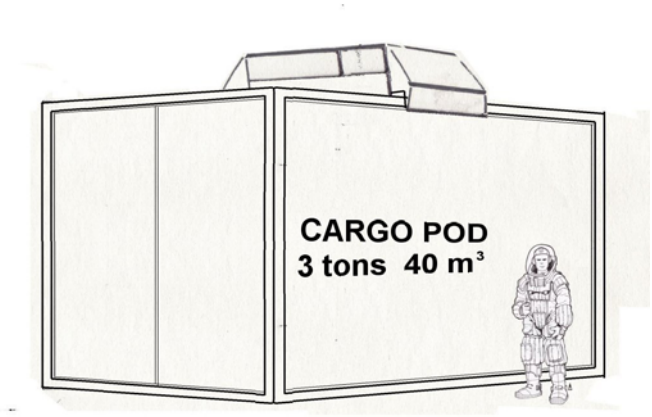
Buy Low And Sell High

Merchants who follow it make money, grow rich, and become successful; those who don't go bankrupt.

The **Traveller** Trade and Commerce system details a consistent process for encountering and pricing trade goods, and for determining the market for goods on a variety of worlds.

THE VOCABULARY OF INTERSTELLAR TRADE

Several terms and concepts are used on the trade and commerce flowcharts.



CARGO POD

Lot. A lot is a single shipment of goods. A lot is identified by its displacement in tons (one ton equals 13.5 cubic meters). Each lot is a distinct shipment and may not be subdivided. A ship captain may accept or reject specific lots based on their best fit within the ship's cargo hold. A lot can be freight, cargo or mail.

Freight. Freight is a lot owned by someone who either wishes to retain ownership of it or has contracted to sell the goods to someone and is shipping them to the buyer. An individual who is shipping his personal effects to a new home is shipping freight. A company that has sold an air/raft to a customer and is now shipping it to that customer is shipping freight.

The standard price for shipping freight is Cr1,000 per ton. The payment covers shipment in the cargo hold from the current location to the starship's next port of call.

Mail. A lot of communications information being shipped under special contract for a postal or express service. Governments operate postal services; private companies operate express services.

Mail is always of incidental size (never major or minor sized lots). To be allowed to carry mail, the ship must be armed and the crew must include a gunner. Each mail lot always consists of at least one ton. Each ton of mail is shipped at a premium rate of Cr15,000.

Cargo. Cargo consists of goods purchased by a speculator or merchant and carried on the speculation that they can be sold at the destination for a profit. A merchant who buys laser rangefinders on an industrial world and ships them to another world in hopes of selling them for a profit is shipping cargo. A merchant who has empty cargo hold space and fills it with locally purchased goods rather than ship empty space is shipping cargo.

A speculator may buy goods and ship them; he considers the lot cargo, while the ship carrying the goods considers it freight. A starship captain may find insufficient freight available on a world and may become a speculator and buy cargo in order to fill unused freight space. The first law of cargo trade is an ancient one: buy low and sell high. Those who follow it make money, grow rich and become successful. Those who don't, go bankrupt.

Merchant. A merchant is an individual or company that operates a cargo-carrying starship. Merchants may also be speculators.

Speculator. A speculator is an individual or company that buys goods in the expectation that they can be sold at a profit later (and usually on another world). A speculator does not necessarily operate a cargo-carrying starship; a speculator may ship its cargo as freight and pay standard freight rates in order to transport the goods to a profitable market.

Source World. A source world is the world where goods originate. The UWP of the Source World is required before goods can be purchased and it is necessary in order to determine the costs of the goods when engaging in speculative trade.

Market World. A market world is the world where goods are to be shipped; it is the market or destination for trade goods. The UWP of the Market World is required before the goods can be sold and it is necessary in order to determine the selling price of the goods when engaging in speculative trade.

Cost. Cost is the amount paid for a cargo at its Source World.

Price. Price is the amount a cargo is expected to sell for at its market world. It is possible to compute the base price of

goods before arriving at a world simply by analyzing the market world's UWP. Careful merchants do this to predict the relative appeal of goods at various accessible worlds.

Price is an expected price; selling price is the actual price determined at the moment of sale.

Selling Price. Selling price is the amount a cargo actually sells for at its market world using the Actual Value Table. Selling price for goods varies as the actual market place conditions fluctuate and it is determined at the moment of sale using the Actual Value Table.

Delivery. A lot is delivered when it is off-loaded at a location comparable to the location where it was loaded. Goods taken in orbit at the Source World are delivered when off-loaded in orbit at the Destination World. Goods loaded on the surface at the Source World are delivered when offloaded on the surface at the Destination World.

This custom applies to both cargo and passengers.

Surface delivery for cargo taken on in orbit calls for a 10% surcharge.

THE CARGO ID

The Cargo ID is a basic identification of the economic nature (but not the precise identity) of trade goods in commerce. It is based on the Trade Classifications and the Tech Levels of the worlds involved.

TL		Trade Classes	Cost
8	**-**	**Na Ni Po**	**Cr3800**

Identifying Cargos. A cargo is identified by stating its source world's Tech Level, Trade Classifications, and Cost. Tech Level is derived directly from the source world UWP. All trade classifications possible are determined and then listed together (the determination of trade classifications is covered below). Cost is determined using the cost system.

For example, a cargo from Regina in the Spinward Marches could be identified as: A Ri Cr7000.

A cargo from Zivije in the Spinward Marches is identified as: B Hi Fl Cr8100.

A cargo from Chronor (a Zhodani world in the Spinward Marches) is identified as: C Na Ni Ic Cr8200 Zh.

Lower cost cargos are always preferable because they allow more potential profit.

Further Identifying Cargos. Using the Cargo ID, match one of the Trade Classifications to the Random Trade Goods Charts and roll 1D. The result is the basic type of trade goods. Again roll 1D and determine the specific trade goods. Finally, match one other Trade Classification to the Trade Goods Detail List to further add detail to the goods.

For example, a goods from Zivije have a Cargo ID = B Hi Fl Cr8100. The only Trade Classification that matches the Random Trade Goods Table is Fl, which appears on Random Trade Goods 2. Roll 1D (=3 = Pharma). Roll 1D again (=5 = Antibiotics). Finally, the other Trade Classification for the Cargo is Hi, which is on the Trade Goods Detail List (Hi = Processed).

The goods from Zivije are Processed Antibiotics.

SPECIAL RULES

The following special rules also apply to trade activity.

Estimating Sale Price. Trader skill allows the partial prediction of the results of the Actual Value Table throws. Use of Trader skill allows one die on the Actual Value Table (the table uses two dice) to be thrown early; knowing one of the dice results beforehand allows a more accurate prediction of the sale price of goods. For example, the two dice throw can range from 2 to 12 and indicates actual values between 40 percent and 170 percent of base price. If one die is thrown early and it is a 6, then the character knows that the final actual value must range between 7 and 12 (or between 100 percent and 170 percent).

Accelerated Delivery: In standard practice, local merchants are allowed four days to deliver goods to a waiting ship. It is possible to accelerate delivery of goods by paying a premium of 10% of base cost per day of advanced delivery.

Required Execution: Once goods are offered for sale and the Actual Value Table is consulted, the goods must be sold at the price indicated. A sale may be stopped at any point before the dice are rolled on the Actual Value Table.

This invites a strategy for cautious merchant players (with Trader skill): roll the dice on the Actual Value Table individually. If the first die is exceptionally low, the deal can be abandoned.

PLAYER SKILLS

The skills of the characters involved in transactions can influences trade situations.

Steward. Steward is a Mod on the roll for available High Passengers.

Admin: Admin is a Mod on the roll for available Mid Passengers.

Streetwise. Streetwise is a Mod on the roll for available Low Passengers.

Broker: Broker is about negotiating the best deal between a buyer and a seller. In its simplest form, the Broker transaction entails very little work while earning a commission. The value of the broker is the knowledge and expertise he provides when problems or exceptions arise.

Broker is a DM (equals half Broker Skill, rounded up) on the Actual Value Table (to a maximum of Mod of +4). Brokers receive 5% of the final sale price per DM.

Liaison: Liaison allows consultation and bargaining with local freight handlers in order to receive a larger allotment of freight. Liaison is a Mod for available Freight.

Trader: Trader provides an understanding of market processes and is used in Estimating Sales Price.

TYPES OF INTERSTELLAR TRADE GOODS

Interstellar trade goods may be of any type, but some are more probable than others. Ordinary materials (such as cast iron ingots) are probably not prime interstellar trade goods.

The Broad Classifications: Interstellar Trade Goods fall into 14 types.

Raws. One of the basic trade goods in interstellar trade is raw materials. The exploration of space is driven in part by a search for essential raw or basic materials in the hopes that they can be found and made available at competitive prices, even after the cost of their transportation over interstellar distances.

Rares. Many trade goods are in demand because of their rarity or relative scarcity.

Consumables. Consumables are food and drink, and may also include aromatics. Consumable **foods** are fashionable gourmet goods (caviar), common flavorings (spices), or staples (basic life-sustaining food) necessary on worlds where it cannot be produced economically. Consumable **drinks** are flavored waters, alcoholic beverages, milks,

nectars, syrups, decoctions such as teas, or exotic wines. Consumable aromatics are smell sources or food enhancers.

Data. Data is Information which can be consumed, reproduced, or processed on the Market World. It includes: Books, tapes, software, creative works, wafers, and scientific data.

Pharma. Pharmaceuticals and Medicine for the treatment of all manner of illness or disability is a prime candidate for interstellar trade. Some medicines may be produced in excess quantity and made available for export in order to help bring down the costs of overall production. Some medicines are best processed or manufactured close to the source of raw materials; the finished product is then exported to other worlds.

Novelties. New products never before seen (or sometimes just never before marketed) are powerful commodities in the marketplace.

Imbalances. When the cost of producing a trade item is very low, then it can be shipped between the stars and sold at a market for less than it costs to produce locally. Worlds with low labor costs often produce goods that can be sold interstellar at a profit.

Valuta. Sometimes shipments between worlds consist of money itself. Interstellar trade eventually produces an inequity in the balance of payments for specific worlds, and to bring the economy back into equilibrium, a physical exchange of money is required.

Samples. Newly discovered, created, or manufactured items may be transported to other worlds for analysis or evaluation.

Uniques. Some products are unique: they cannot be easily synthesized or reproduced. an exotic wood that adds interest as a decoration or flavor as when burned for cooking; an herb which provides a special flavoring; an iridescent feather which becomes fashionable for a limited time; a pebble that makes gentle noises when heated.

Manufactureds. Worlds with established factories export their products to worlds which cannot produce them.

Scrap/Waste. The trash of some worlds can become the valued treasure on others.

Entertainments. Creative works and diversions are always in demand.

Red Tape. Because there are interstellar governments, the products of their bureaucracy must be distributed through its area of authority. Red tape shipments include originals or reproducible masters of regulations, files of information about citizenry and companies, and reports.

Much of the red tape shipped between worlds is not sold; it is transported as cargo to archives or to other offices of the bureaucracy. But some of the information can be purchased and then shipped to other worlds where it can be sold to businesses or organizations which can use it. For example, tax records might indicate likely customers for specific goods; reports might provide clues (after analysis) for prediction of future

THE TRADE GOODS CHARTS

This section is not intended to be comprehensive: interstellar trade necessarily encompasses thousands and thousands of distinct trade goods. Nevertheless, the random trade goods creation system can produce 36 different goods per basic trade classification, and thousands of distinct trade goods before it consistently repeats.

The following are 259 examples of probable trade goods.

Types
Raws
Rares
Consumables
Data
Pharma
Novelties
Imbalances
Valuta
Samples
Uniques
Manufactureds
Scrap/Waste
Entertainments

Examples
Accountings
Adhesives
Aged Meats
Allotropes
Alloys
Anagathics
ANIFX Blocker
ANIFX Dyes
ANIFX Emitters
Antibiotics
Antidotes
Antifungals
Anti-Matter
Antique Art
Antiques
Antiseptics
Antitoxins
Antivirals
Archeologicals
Armor
Aromatics
Art
Artifacts
Attractants
Aware Blockers
Awareness Pinger
Backups
Biologics
Branded Clothes
Branded Devices
Branded Drinks
Branded Foods
Branded Oxygen
Branded Tools
Branded Vacc Suits
Bulk Abrasives
Bulk Carbon
Bulk Carbs
Bulk Copper
Bulk Dusts
Bulk Ephemerals
Bulk Fats
Bulk Fibers
Bulk Foodstuffs
Bulk Gases
Bulk Herbs
Bulk Ices
Bulk Iron
Bulk Metals
Bulk Minerals
Bulk Nitrates
Bulk Nutrients
Bulk Organics
Bulk Oxygen
Bulk Particulates
Bulk Pelts
Bulk Petros
Bulk Pharma
Bulk Precipitates
Bulk Protein
Bulk Spices
Bulk Synthetics
Bulk Textiles
Bulk Woods
Candies
Carbons
Catalysts
Chelates
Coinage
Cold Light Blocks
Cold Sleep Pills
Cold Welders
Collectible Books
Collectibles
Combat Drug
Combination
Contemplatives
Corrosives
Counter-prions
Crafted Devices
Cryo Alloys
Cryogems
Currency
Databases
Decoctions
Decorations
Delicacies
Disposables
Dominants
Drinkable Lymphs
Dupe Masterpieces
Echostones
Educationals
Edutainments
Electronics
Emotion Lighting
Encapulants
Envirosuits
Ephemerals
Excretions
Exotic Aromatics
Exotic Crystals
Exotic Fauna
Exotic Flora
Exotic Fluids
Exotic Sauces
Expert Systems
Famous Wafers
Fast Drug
Fauna
Fermented Fluids
Filter Mask
Fine Aromatics
Fine Art
Fine Carpets
Fine Dusts
Fine Furs
Fission Suppressant
Flavored Air
Flavored Drinks
Flavored Waters
Flavorings
Flill
Flora
Flowers
Fluidic Timepieces
Fluidics
Foodstuffs
Fossils
Fruit Delicacies
Gallium
Gemstones
Germanes
Gold
Gravitics
Group Symbols
Hats
Health Foods
Heat Pumps
Holo Sculpture
Holo-Companions
Hummingsand
Improvements
Incenses
Incomprehensibles
Insidiants
Insulants
Iridium Sponge
Isotopes
Jewelery
Juices
Lanthanum
Lek Emitters
Livestock
Luminescents
Mag Emitters
Magnetics
Mandates
Masterpieces
Meat Delicacies
Mechanicals
Meson Barriers
Metals
Minerals
Money Cards
Monumental Art
Motile Plants
Museum Items
Music
Musical Instruments
Navigators
Nectars
Noisemakers
Non-Fossil Carcasses
Nostrums
Novel Flavorings
Nutraceuticals
Obsoletes
Ores
Organic Gems
Organic Polymers
Osmancies
Painkillers
Palliatives
Panacea
Parts
Pattern Creators
Pelts
Percept Blockers
Pheromones
Photonics
Pigments
Platinum
Plutonium
Polymer Sheets
Polymers
Pseudo Hormones
Radioactive Ores
Radioactives
Radium
Rare Minerals
Raw Sensings
Reactive Plants
Reactive Woods
Reclamation Suits
Recordings
Regulations
Reparables
Replicating Clays
Repulsant
Respirators
Restoratives
Robots
Secretions
Seedstock
Self-Defender
Self-Solving Puzzles
ShimmerCloth
Silanes
Silver
Skin Tones
Slow Drug
Sludges
Software
Soothants
Sophont Cuisine
Sophont Hats
Soundmakers
Sparx
Spices
Stimulants
Strange Crystals
Strange Seeds
Synchronizations
Tactiles
Textiles
Thorium
Tisanes
Unusual Dusts
Unusual Fluids
Unusual Ices
Unusual Minerals
Unusual Rocks
Upgrades
Uranium
Used Goods
Vacc Gems
Vacc Suit Patches
Vacc Suit Scents
Variable Tattoos
VHDUS Blocker
VHDUS Dyes
VHDUS Emitters
Vision Suppressant
Wafers
Warm Leather
Weapons
Wines
Writings

Accountings. Data reconciling expenditures by government and business.

Adhesives. Bonding agents.

Aged Meats. Meats enhanced in flavor and texture by traditional methods.

Allotropes. Specific unusual forms of chemical elements useful for industry.

Alloys. Metallic mixtures created to create or enhance the characteristics of metals.

Anagathics. Pharma capable of extending lifespan.

ANIFX Blocker. Transparent or translucent flexible sheets which are opaque to wavelengths ANIFX.

ANIFX Dyes. Textile dyes with colors in the wavelengths ANIFX.

ANIFX Emitters. Objects which glow (or regularly or intermittently pulse) in the wavelengths ANIFX.

Antibiotics. Pharma capable of targeting and killing microbes.

Antidotes. Pharma which counteract poisons (inorganic poisons) within organisms.

Antifungals. Pharma capable of targeting and killing fungi.

Anti-Matter. Non-trivial amounts of anti-matter (in magnetic or gravitic containment vessels).

Antique Art. Works of fine art more than 100 years old.

Antiques. Crafted objects more than 100 years old.

Antiseptics. Pharma which kill microbes on the skin and outer surfaces of sophonts and fauna.

Antitoxins. Pharma which neutralize specific poisons (typically organic toxins) within organisms.

Antivirals. Pharma which treat virus infections.

Archeologicals. Detritus of sophont cultures or civilizations excavated for its insights into its creators. Some archeologicals are devices whose uses may or may not be apparent.

Armor. Personal protective devices and apparel.

Aromatics. Substances which emit attractive or beneficial scents or smells

Art. Sophont produced visual objects or images illustrating abstract thought or emotion. Typically, paintings, drawings, or sculpture.

Artifacts. Objects produced by the high-tech civilization of the Ancients (distinct from archeologicals)..

Attractants. Substances (typically pheromones) which create a compulsion to move closer to the attractant source.

Aware Blockers. Objects which are opaque to Awareness.

Awareness Pinger. Device which emits a recurrent signal which can be sensed by Awareness.

Backups. Computer media files capturing a totality of data processing activity. Backups are added to the available resources of computer systems which are not directly connected to the original generator (usually because of distance).

Biologics. Organic materials useful in industry.

Branded Clothes. Fashionable apparel characterized by a brand name which serves as a guarantee of quality.

Branded Devices. Fashionable personal devices characterized by a brand name which serves as a guarantee of quality.

Branded Drinks. Fashionable beverages characterized by a brand name which serves as a guarantee of quality.

Branded Foods. Fashionable foodstuffs characterized by a brand name which serves as a guarantee of quality. Brand names may imply social or group membership perceptions.

Branded Oxygen. Fashionable breathing gases characterized by a brand name which serves as a guarantee of quality.

Branded Tools. Fashionable equipment for specific skill sets and characterized by a brand name which serves as a guarantee of quality.

Branded Vacc Suits. Fashionable environmental suits characterized by a brand name which serves as a guarantee of quality.

Bulk Abrasives. Simple granulated compounds with uses as cutting, finishing, or polishing.

Bulk Carbon. Carbon (pure, or in compounds) suitable for use in industry.

Bulk Carbs. Carbohydrate nutrients suitable for the creation of synthetic foods.

Bulk Copper. Pure or alloyed copper metal suitable for use in industry.

Bulk Dusts. Homogeneous mineral materials of extremely small diameter.

Bulk Ephemerals. Captured or acquired materials with useful qualities. Ephemeral materials include natural compounds which degrade easily or quickly, and foods which lose their freshness quickly.

Bulk Fats. Edible nutrient fats and oils suitable for the creation of synthetic foods.

Bulk Fibers. Animal or plant component fibers suitable for the creation of textiles.

Bulk Foodstuffs. Edibles.

Bulk Gases. Captured atmospheric, environmental, geothermal, or volcanic gases with uses in industry.

Bulk Herbs. Plant structures and components suitable for medicinal purposes.

Bulk Ices. Low temperature solids which are liquids or gases at habitable sophont temperatures, and suitable for industry.

Bulk Iron. Pure or alloyed iron metal suitable for use in industry.

Bulk Metals. Smelted metallic elements of reasonable purity and suitable for use in industry.

Bulk Minerals. Simple compounds produced by natural geologic processes.

Bulk Nitrates. Nitrogen compounds (natural excretions or droppings from animals, or synthetic processed compounds) suitable for use in agriculture or industry.

Bulk Nutrients. Animal or plant mixed nutrients (fats, proteins, carbs) suitable for the creation of synthetic foods.

Bulk Organics. Animal or plant components with mixed uses.

Bulk Oxygen. Breathing gases for typical sophonts, typically in large compressed gas containers.

Bulk Particulates. Useful minerals particles characterized by very small diameters and consistent chemical properties.

Bulk Pelts. Animal skins suitable for the production of furs, leathers, or other coverings.

Bulk Petros. Native hydrocarbon fossil fuels and other petrochemicals. Low technology levels may use Petros for fuel; they are more universally used as lubricants and feedstocks for the creation of plastics.

Bulk Pharma. Animal or plant components suitable for refinement into or reduction to pharmaceuticals.

Bulk Precipitates. Chemicals in powered or granular form as a consequence of some natural or artificial process on the world.

Bulk Protein. Animal or plant protein nutrients suitable for the creation of synthetic foods.

Bulk Spices. Plant structures and components suitable for culinary purposes.

Bulk Synthetics. Artificially produced materials mimicking (or improving upon) the characteristics of one or more other materials.

Bulk Textiles. Cloth and fabric suitable for further use in industry.

Bulk Woods. Plant structures suitable as large scale or small scale construction materials.

Candies. Snacks, treats and delicacies usually (but not always) appealing to the sweet sensors of the taste sense.

Carbons. Processed Carbon (pure, or in compounds) suitable for use in industry.

Catalysts. Specific elements, compounds, or organics which improve the efficiency of industrial processes.

Chelates. Pharma which bind to and remove heavy metals from an organism.

Coinage. Metal or plastic tangibles or manipulables used as money.

Cold Light Blocks. Individualized rectangular units which glow brightly and without accompanying heat. The blocks constantly recharge based on magnetic, gravitic, or photonic principles.

Cold Sleep Pills. Pharma which produces suspended animation in animals and sophonts.

Cold Welders. Simple wands which fuse specific polymers using enzyme reactions.

Collectible Books. Random titled bound books of various levels of rarity.

Collectibles. Objects of limited availability and in demand across a broad spectrum of interested individuals.

Combat Drug. Pharma capable of increasing personal C1 and C3 and typically used by soldiers in battle.

Combination. Breathing devices which compress Very Thin (Atm 2-3) or Thin (Atm 4-5) to Standard (Atm 6). Combination incorporates a filter component which allows use in tainted conditions.

Contemplatives. Simple textured totems reputed to provide comfort, inspiration, or self-assurance to sophonts.

Corrosives. Substances (gases, fluids) capable of penetrating traditional or normal sealed barriers. Corrosives are components of corrosive atmospheres (Atm B).

Counter-prions. Pharma which (as a food additive) actively counteract prions.

Crafted Devices. Small items of equipment which have been carefully created for quality and reliability.

Cryo Alloys. Metallic alloys which achieve their characteristics through cold tempering.

Cryogems. Gemstones encountered in very low temperature environments (although they are stable at habitable temperatures).

Currency. Paper money or certificates of value.

Databases. Collections of information suitable for support of government or commerce.

Decoctions. Plant-based beverages produced by mashing followed by boiling.

Decorations. Attractive or pleasing objects suitable for enhancing buildings, rooms, or walls.

Delicacies. Rare or unusual foods prepared according to local cultural recipes. Delicacies may have market value for their rarity, their taste, or for their traditional cultural value.

Disposables. Useful objects intended for single or limited use before being discarded.

Dominants. Substances (scents, pheromones) which reduce the will to resist in individuals.

Drinkable Lymphs. Animal-based beverages produced from lymph fluids harvested from world-specific fauna.

Dupe Masterpieces. Mass market reproductiuons of craftsman produced priceless masterpieces.

Echostones. Mineralogical objects which repeat sounds from the environment. The most prized of echostones repeat with a significant delay (minutes or hours), and artful arrangements of echostones can fill a room with music or background sounds.

Educationals. Software-based materials produced (by government or industry) to increase knowledge or awareness of specific subject matter, often with a specific viewpoint or with a propagandistic flavor.

Edutainments. Software-based materials with demographically targeted entertainment value produced (by government or industry) to increase knowledge or awareness of specific subject matter, often with a specific viewpoint or with a propagandistic flavor.

Electronics. Electronic materials useful in industry.

Emotion Lighting. Illumination systems controlled by sensors which respond in individual or group emotions.

Encapulants. Fluids which naturally flow around objects they encounter, and which form coatings as they dry or cure.

Envirosuits. Environmental or protective suits.

Ephemerals. Objects of value which degrade without special efforts or conditions to preserve their characteristics or freshness.

Excretions. Useful substances produced as waste products from organisms.

Exotic Aromatics. Scent emitting substances with strange, unusual, or esoteric characteristics.

Exotic Crystals. Organic or mineralogical crystals with strange, unusual, or esoteric characteristics.

Exotic Fauna. Animals with strange, unusual, or esoteric characteristics.

Exotic Flora. Plants with strange, unusual, or esoteric characteristics.

Exotic Fluids. Liquids (and some gases) with strange, unusual, or esoteric characteristics.

Exotic Sauces. Culinary liquids with strange, unusual, or esoteric characteristics.

Expert Systems. Software systems with a strong skill set related to a specific subject.

Famous Wafers. Classic or well-known recorded personality entertainments.

Fast Drug. Pharma capable of decreasing the metabolism (making the universe appear to move more quickly).

Fauna. Animals.

Fermented Fluids. Organic fluids which have been processed to induce an alcoholic content.

Filter Mask. A breathing device which allows breathing (if otherwise possible) in Tainted atmosphere (Atm 2,4,7,9).

Fine Aromatics. High quality scent sources.

Fine Art. High quality objects created by artists.

Fine Carpets. High quality floor coverings.

Fine Dusts. High quality homogeneous mineral materials of extremely small diameter.

Fine Furs. High quality animal pelts.

Fission Suppressant. Device capable of suppressing nuclear fission within a small radius (50 meters).

Flavored Air. Breathing gases supplemented with additives which appeal to smell and taste. Some flavored airs mask taints; others are more palatable versions of intrinsic taints.

Flavored Drinks. Beverages whose primary characteristic is flavor (as opposed to nourishment). Many flavors are mildly addictive.

Flavored Waters. Water supplemented with flavors.

Flavorings. Additives which provide interesting, attractive, or unusual taste and smell sensations.

Flill. Organic gems characterized by beautiful lek and mag emissions. Flill are prized by sophonts with awareness.

Flora. Plant life.

Flowers. Attractive plant components.

Fluidic Timepieces. Chronometrical devices based on fluidic principles.

Fluidics. Fluidic materials useful in industry.

Foodstuffs. Assorted plant and animal products suitable for consumption and nutrition.

Fossils. Geologically preserved remains of flora and fauna

Fruit Delicacies. Edible fruits enhanced with a variety of culinary treatments to create attractive (or unusual) flavors and textures.

Gallium. Elemental gallium in certified purity levels and suitable for use as money.

Gemstones. Attractive examples of precious or semi-precious stones.

Germanes. Germanium based compound useful in industry.

Gold. Metallic gold in certified purity levels and suitable for use as money.

Gravitics. Gravitic materials useful in industry.

Group Symbols. Items of clothing worn to show a connection to a group. Occasionally, group symbols become fashionable for non-members (athletic jerseys for non-athletes; naval pilot jackets for ordinary citizens).

Hats. Head coverings.

Health Foods. Foodstuffs with real or imagined health promoting components.

Heat Pumps. Personal equipment capable of drawing heat from the enviroment.

Holo Sculpture. Large scale three dimensional images intended for outdoor display.

Holo-Companions. Holographic projections controlled by software and programmed to interactively accompany an individual. Dogs (vacc-suited or not) as companions to vacc-suited surface traveler.

Hummingsand. Granular minerals which vibrate (creating sounds) in response to light, heat, or other stimulus.

Improvements. New feature additions to common devices.

Incenses. Organic substances which, when burned, produce aromas.

Incomprehensibles. Objects for which there is no readily apparent use (they do have a use; it is not readily apparent).

Insidiants. Substances (gases, fluids) capable of penetrating traditional or normal sealed barriers. Insidiants are components of insidious atmospheres (Atm C).

Insulants. Substances which inhibit thermal equilibrium.

Iridium Sponge. Elemental iridium exposed to vacuum and gases to create an internal sponge texture. Iridium is principal component of positronic brains.

Isotopes. Elements refined to a high level of purity as to isotopic content.

Jewelery. Decorative personal accessories crafted from precious metals and gems or gemstones.

Juices. Vegetable or fruit liquids.

Lanthanum. Elemental lanthanum. This material is crucial to the construction of jump drives.

Lek Emitters. Devices which emit (glow, pulse) in the Lek wavelength.

Livestock. Live animals suitable for herd or flock creation, or less frequently, for slaughter.

Luminescents. Panels which reactively emit a variety of wavelengths in response to external conditions.

Mag Emitters. Devices which emit (glow, pulse) in the Mag wavelength.

Magnetics. Interesting or useful devices employing the principles of magnetics.

Mandates. Administrative or judicial orders for distribution to a wide variety of individuals, businesses, functionaries, and organizations.

Masterpieces. Works created by craftmen.

Meat Delicacies. Edible meats enhanced with a variety of culinary treatments to create attractive (or unusual) flavors and textures.

Mechanicals. Individual component parts for machines.

Meson Barriers. Thin sheets capable of reducing the transit of mesons.

Metals. Elemental or alloyed metals suitable for technological uses.

Minerals. Natural resources materials useful when incorporated into manufactured products, and (or) capable of being reduced or refined into its component compounds or elements.

Money Cards. Machine readable incremental certificates of value. Pre-loaded debit cards.

Monumental Art. Large scale (larger than life size) sculpture created to impose concepts, personalities, or ideologies on the public or citizenry.

Motile Plants. Flora capable of changing location.

Museum Items. The wide array of items suitable for display and exemplifying the history, art, technologies, or personalities of a location, region, people, or other activity.

Music. Recordings of musical performances.

Musical Instruments. Devices capable of producing music when used by individuals with Music skill.

Navigators. Portable devices which show current location (and perhaps other data).

Nectars. Nutrient rich liquid produced by plants.

Noisemakers. Natural objects which create loud or jarring sounds in response to heat, touch, or other stimulus.

Non-Fossil Carcasses. Pre-historic preserved (frozen, dessicated, mummified) carcasses of animals or sophonts. Pre-historic, in the case of each world, is before initial settlement of the world.

Nostrums. Pharma of unproven efficacy. Nostrums are often branded and aggressively marketed.

Novel Flavorings. Natural or synthetic food additives

Nutraceuticals. Foodstuffs and nutrients with Pharma capabilities.

Obsoletes. Devices which have been supplanted or replaced by newer, better, or more technologically advanced devices which accomplish the same purposes.

Ores. Mineralogical materials with a high content in desirable components and suitable for their extraction.

Organic Gems. Small valuable objects of organic origin, often highly prized for their appearance. Includes jet, pearl, ivory, bone, amber, sparx, and flill.

Organic Polymers. Large molecules with useful characteristics produced through life processes.

Osmancies. Recordings of performances involving smells.

Painkillers. Pharma which reduce or eliminate pain.

Palliatives. Pharma which reduce or eliminate symptoms.

Panacea. Pharma which cure disease or malady. Technically, the term panacea indicates a cure for all diseases and maladies. In use, a

Parts. Component replacement parts for common devices.

Pattern Creators. Automated devices which place patterns and decorations on walls, floors, and

ceilings. Pattern creators are a form of interior decoration; some are constantly laying down new patterns; others are instructed to change the patterns daily, or monthly.

Pelts. The skins or outer coverings of animals.

Percept Blockers. Fabric sheets which are opaque to the perception sense.

Pheromones. Chemicals which trigger natural behavioral responses in animals.

Photonics. Photonic materials useful in industry.

Pigments. Coloring agents.

Platinum. Metallic platinum in certified purity levels and suitable for use as money.

Plutonium. Radioactive elemental metal useful in industry.

Polymer Sheets. Plastic sheets.

Polymers. Plastics.

Pseudo Hormones. Artificial or synthetic hormones which carry encoded chemical instructions to living cells or organs. Pseudo hormones carry chemical instructions which are not carried by natural hormones.

Radioactive Ores. Minerals with significant radioactive metal content.

Radioactives. Radioactive materials useful in industry.

Radium. Radioactive elemental metal useful in industry.

Rare Minerals. Scarce or rarely occurring simple compounds produced by natural geologic processes.

Raw Sensings. Digital data acquired through the normal course of operations by large scale computer operations.

Reactive Plants. Plants which exhibit some response (movement, color change, scent release, collapse, flower release) to a stimulus.

Reactive Woods. Woods which exhibit some response (color change, iridescence, scent release) to a stimulus.

Reclamation Suits. Personal environmental suits which recapture (reclaim) water vapor exhaled or perspired by the user. Reclamation suits are common in water-poor environments (Desert worlds).

Recordings. Records of performances, including concerts, plays, and readings.

Regulations. Software, printed materials, and other items which convey the implementations of laws by bureaucratic organizations.

Reparables. Inoperative devices capable of being repaired, restored, or refurbished to usable or near new condition.

Replicating Clays. Novelty soil materials which spontaneously combine and replicate in patterns and colors.

Repulsant. Substances (scents, pheromones) which repel or create a sense of aversion in individuals.

Respirators. Breathing devices which compress Very Thin (Atm 3) or Thin (Atm 5) to Standard (Atm 6).

Restoratives. Pharma capable of reversing specific organic effects, or restoring organic components to a previous state. Some restoratives have cosmetic effects; others reverse organic damage from disease or accident; still others halt or reverse aging.

Robots. Mechanical artificial sophonts.

Secretions. Useful substances produced by organisms for specific purposes; industrial or commercial uses of the substance may differ from the original organic purpose..

Seedstock. Propagation materials for plants suitable for crop production, or for hybridization.

Self-Defender. Personal handgun with features which enhance its uses in defense and reduce its uses in offense.

Self-Solving Puzzles. Intricate devices which use mechanical, electronic, or other principles to move components from one state to another.

ShimmerCloth. Textiles produced in colorful patterns. Shimmercloth colors are active rather than passive or reflective; some patterns change in long cycles.

Silanes. Silicon based compound useful in industry.

Silver. Metallic silver in certified purity levels and suitable for use as money.

Skin Tones. Temporary cosmetic fashionable skin colorants.

Slow Drug. Pharma capable of increasing the metabolism (making the universe appear to move more slowly).

Sludges. Industrial waste materials.

Software. Computer applications.

Soothants. Pharma (or devices, or objects) which reduce anxiety.

Sophont Cuisine. Various foodstuffs prepared according to a specific sophont cultural traditions and recipes.

Sophont Hats. Interesting head coverings from local sophont cultures.

Soundmakers. Natural objects which create unusual or interesting sounds in response to heat, touch, or other stimulus.

Sparx. Organic gems characterized by a piezo process which delivers a mild electric tingle. Sparx are prized by sophonts with touch as a primary sense.

Spices. Food flavorings and additives.

Stimulants. Pharma which temporarily increase physical characteristics.

Strange Crystals. Mineralogical or organic crystals suitable for decoration or jewelery.

Strange Seeds. Flora reproduction vectors with unusual characteristics and suitable for decoration or for industrial application.

Synchronizations. Data files and applications which make local data bases interactively merge the content of distinct data bases.

Tactiles. Natural objects which respond to touch by emitting heat or light, changing shape, or vibrating.

Textiles. Cloth or fabric suitable for creation of garments.

Thorium. Radioactive elemental metal useful in industry.

Tisanes. Plant-based beverages produced by dissolving essential plant elements in water or oil.

Unusual Dusts. Fine particle collections with unusual characteristics suitable for industry.

Unusual Fluids. Chemical fluids with unusual characteristics suitable for industry.

Unusual Ices. Low temperature compounds and combinations with unusual characteristics suitable for industry.

Unusual Minerals. Natural geological substances with unusual characteristics suitable for industry.

Unusual Rocks. Unrefined and undifferentiated minerals with unusual characteristics suitable for industry.

Upgrades. Software improvements.

Uranium. Radioactive elemental metal useful in industry.

Used Goods. Objects which have been previously purchased and used for some reasonable period of time. They show cosmetic wear and may be missing user documentation.

Vacc Gems. Small valuable objects (usually mineralogical) highly prized for their unusual qualities. Vacc gems are formed through the long term action of vacuum (and other effects: radiation, stellar wind, magnetic fields) on minerals or crystals.

Vacc Suit Patches. Adhesive repair units for vacc suits.

Vacc Suit Scents. Aromatic additives which remove, disguise, overlay, or transform existing smells within vacc suits.

Variable Tattoos. Body or skin markings which slowly change (randomly, or in cycles) over time.

VHDUS Blocker. Transparent or translucent flexible sheets which are opaque to wavelengths VHDUS.

VHDUS Dyes. Textile dyes with colors in the wavelengths VHDUS.

VHDUS Emitters. Objects which glow (or regularly or intermittently pulse) in the wavelengths VHDUS.

Vision Suppressant. Phereomone which temporarily shuts down the vision sense.

Wafers. Recorded personalities labeled by donor sophont and general donor skillset..

Warm Leather. Luxury materials composed of prepared animal skins which channel heat to the exterior surfaces.

Weapons. Small arms intended for personal, security, or military use.

Wines. Alcoholic beverages.

Writings. Printed published texts.

Imbalance Items

Imbalance Items are in oversupply on the source world; often they are imports no longer in demand (and thus available for shipment elsewhere).

For Trade Goods identified as Imbalances (in the Random Trade Goods Table), use the Trade Classifications shown and re-roll on the Random Trade Goods Table to identify the goods. If these goods are sold on a market world with this Trade Classification, increase their Price +Cr1,000.

Trade Classifications

Using the Universal World Profile UWP for the character's homeworld, determine all possible Trade Classifications that apply. A character receives the homeworld skill associated with each Trade Classification.

Trade Classifications

Group	Code	Siz	Atm	Hyd	Pop	Gov	Law	Definition	--	Skill
Planetary	As	0	0	0	--	--	--	Asteroid	--	Zero-G
	De	--	23456789	0	--	--	--	Desert	--	Survival
	Fl	--	ABC	123456789A	--	--	--	Fluid		Hostile Environ
	Ga	678	568	567	--	--	--	Garden World	--	Trader
	He	3459ABC	2479ABC	012	--	--	--	Hellworld		Hostile Environ
	Ic	--	01	123456789A	--	--	--	Ice-Capped	--	Vacc Suit
	Oc	ABC	--	A	--	--	--	Ocean World	--	Hi-G
	Va	--	0	--	--	--	--	Vacuum	--	Vacc Suit
	Wa	56789	--	A	--	--	--	Water World	--	Seafarer
Population	Di	--	--	--	0	0	0	Dieback (000-T)	T>0	---
	Ba	--	--	--	0	0	0	Barren	T=0	---
	Lo	--	--	--	123	--	--	Low Population	--	Flyer
	Ni	--	--	--	456	--	--	Non-industrial	--	Driver
	Ph	--		--	8	--		Pre-High	--	
	Hi	--	--	--	9ABC	--	--	High Population	--	Streetwise
Economic	Pa	--	456789	45678	48	--	--	Pre-Agricultural	--	Trader
	Ag	--	456789	45678	567	--	--	Agricultural	--	Animals
	Na	--	0123	0123	6789ABC	--	--	Non-agricultural	--	Survey
	Pi	--	012479	--	78	--	--	Pre-Industrial	--	JOT
	In	--	012479	--	9ABC	--	--	Industrial	--	One Trade
	Po	--	2345	0123	--	--	--	Poor	--	Steward
	Pr	--	68	--	59	--	--	Pre-Rich	--	Craftsman
	Ri	--	68	--	678	--	--	Rich	--	One Art
Climate	Fr	23456789	--	123456789A	--	--	--	Frozen	HZ +2 or outer	Hostile Env
	Tr	6789	456789	34567	--	--	--	Tropic	HZ -1	Survival
	Tu	6789	456789	34567	--	--	--	Tundra	HZ +1	Survival
	Tz	--	--	--	--	--	--	Twilight Zone	Orbit 0-1	Driver
Secondary	Fa	--	456789	45678	23456	--		Farming	Not MW. HZ	Animals
	Mi	--	--	--	23456	--		Mining	Not MW. MW=In	Survey
Political	Cp	--	--	--	--	--		Subsector Capital	Imperial	Admin
	Cs	--	--	--	--	--		Sector Capital	Imperial	Bureaucracy
	Cx	--	--	--	--	--		Capital	Imperial	Language
	Cy	--	--	--	56789A	6	0123	Colony	--	Driver
	Pe	--	--	--	34567	6	6789	Penal Colony	Imperial	Fighting
	Re	--	--	--	1234	6	45	Reserve	Imperial	Flyer
Special	Fo	--	--	--	--	--	--	Forbidden (Red Zone)	--	
	Pz	--	--	--	789ABC	--	--	Puzzle (Amber Zone)	--	
	Da	--	--	--	0123456	--	--	Danger (Amber Zone)	--	
	Ab	--	--	--	--	--		Data Repository	--	One Knowledge
	An	--	--	--	--	--		Ancient Site	--	Xenology

Adjustments: Ba requires Starport E or X. Cp, Cs, Cx require Starport A.

Ab	One Knowledge	Cx	Language	Ic	Vacc Suit	Pe	Fighting	Tu	Survival
Ag	Animals	De	Survival	In	One Trade	Pi	JOT	Tz	Driver
An	Xenology	Di	no skill	Lo	Flyer	Po	Steward	Ux	Xenology
As	Zero-G	Fa	Animals	Mi	Survey	Pr	Craftsman	Va	Vacc Suit
Ba	no skill	Fl	Hostile Env	Na	Survey	Pw	Trader	Wa	Seafarer
Co	Driver	Fr	Hostile Env	Ni	Driver	Re	Flyer		
Cp	Admin	He	Hostile Env	Oc	Hi-G	Ri	One Art		
Cs	Bureaucracy	Hi	Streetwise	Pa	Trader	Tr	Survival		

Homeworld Skills: For each TC shown for a homeworld, the character receives the indicated skill.

Trade and Commerce

Carrying freight between worlds is the basis of interstellar commerce.

Trade-1

CHECKLIST

1. Find Passengers and Freight.
   A. Roll for all 3 passenger types.
   B. Roll for all 3 types of cargoes.
2. Buying Trade Goods.
   A. Find Sourceworld Trade Data.
      1. Trade Classifications.
      2. Starport Type.
      3. Tech Level.
   B. Find Cost of Goods.
      1. Trade Price Modifiers
      2. Tech Level Modifiers
      3. Starport Type Modifier.
      4. Accelerated Delivery.
   C. Purchase Goods.
3. Selling Trade Goods
   A. Find Market World Trade Data.
      1. Trade Classifications.
      2. Starport Type.
      3. Tech Level.
   B. Find Price For Goods.
      1. Trade Price Modifiers
      2. Tech Level Modifiers
      3. Starport Type Modifier.
   C. Sell Goods.

MERCHANT SHIP REVENUES

Item	Income
High Passage	Cr10,000
Middle Passage	8,000
Low Passage	1,000
Freight (per ton)	1,000
Mail (if fitted to carry Mail)	15,000

These tables reflect available levels of goods and passengers appropriate for Player Characters. They do not reflect overall economic demand.

PASSENGERS

Roll once for each type on the day the ship leaves port.

High= Flux + Pop at Cr10,000
Mod = + Steward

Mid = Flux + Pop at Cr 8,000
Mod= + Admin

Low = Flux + Pop at Cr 1,000
Mod= + Streetwise

FREIGHT

Roll once for each type each day until the ship has enough freight and cargo.

Daily:

Freight = (Flux + Pop) x (total TCs +1)
Mod= +Liaison

Total TCs from this list (as used on next page):
Ag As Ba De Fl Hi Ic In Lo
Na Ni Po Ri Va Wa

Cargo = up to 100 tons available (of all types; daily).

Each day, accepted freight is loaded into the hold and payment credited.

The ship leaves when the Captain decides it is ready.

MAIL SHIPMENTS

There are often shipments of mail waiting to be carried to another world. A ship can inquire at the starport about availability.

Each mail shipment is one ton. Payment is a Voucher for Cr15,000 redeemable at any A Starport.

The Destination World must be at least Importance-2 lower than the current world.

BROKERS

Broker	Starport	Mod	Comm
Broker-7+	A	+4	20%
Broker-6	AB	+3	15%
Broker-5	AB	+3	15%
Broker-4	ABC	+2	10%
Broker-3	ABC	+2	10%
Broker-2	ABCD	+1	5%
Broker-1	ABCD	+1	5%

Brokers influence the Cargo Actual Value Table, but must be paid their commission for the transaction.

LONG TERM MAIL CONTRACTS

Mail and Private Express contracts can be negotiated on a Long-Term (one Year) basis.

Contracts are awarded to the lowest bidder. A ship specifies a route (between two worlds with an **Importance** difference of at least 2) bids; if the bid is lower than the Lowest Bid on the Table, the ship wins the contract.

2D	10 Round Trips Lowest Bid	5 Round Trips Lowest Bid
2	Cr8,000	Cr4,000
3	Cr10,000	Cr6,000
4	Cr12.000	Cr8,000
5	Cr13,000	Cr10,000
6	Cr14,000	Cr13,000
7	Cr15,000	Cr15,000
8	Cr16,000	Cr18,000
9	Cr18,000	Cr22,000
10	Cr20,000	Cr24,000
11	Cr22,000	Cr28,000
12	Cr24,000	Cr30,000

Bid is per Jump.

10 Round Trips in a calendar year.

5 Round Trips in a calendar year allows negotiating a similar contract for another route in the same year.

Trade and Commerce

Carrying freight between worlds is the basis of interstellar commerce.

Trade-2

IDENTIFYING A CARGO

TL		Tc1	Tc2	Tc3	Tc4	Tc5	Cost
8	-	De	Hi	In	Na	Po	Cr3,800

Starport. The Starport of the Sourceworld.
TL. The TL of the Sourceworld.

TC1 2 3 4 5. The Trade classifications of the Sourceworld.
Cost. The computed cost of the goods. The cost per ton.

BUYING GOODS

Determine Sourceworld Tech Level
Base Cost = Cr3,000

Trade Class Effects

Code	Source		
Ag	Agricultural	-1,000	
As	Asteroid Belt	-1,000	
Ba	Barren World	+1,000	
De	Desert World	+1,000	
Fl	Fluid Oceans	+1,000	
Hi	High Population	-1,000	
Ic	Ice Capped		(all applicable)
In	Industrial	-1,000	
Lo	Low Population	+1,000	
Na	Non-Agricultural		
Ni	Non-Industrial	+1,000	
Po	Poor World	-1,000	
Ri	Rich World	+1,000	
Va	Vacuum World	+1,000	
Wa	Water World		

Tech Level Effect = Plus TL x Cr100

Total Cost

SELLING GOODS

Determine Marketworld Tech Level
Base Price = Cr5,000

Trade Class Effects =

Source		Market								
Ag	>	Ag	As	De		Hi	In	Ri	Va	+1,000 per
As	>		As				In	Ri	Va	+1,000 per
Ba	>						In			+1,000 per
De	>			De						+1,000 per
Fl	>				Fl		In			+1,000 per
Hi	>					Hi				+1,000 per
Ic	>									
In	>	Ag	As	De	Fl	Hi	In	Ri	Va	+1,000 per
Lo	>									
Na	>		As	De					Va	+1,000 per
Ni	>									
Po	>	Ag				Hi	In	Ri		-1,000 per
Ri	>	Ag		De		Hi	In	Ri		+1,000 per
Va	>		As	In					Va	+1,000 per
Wa	>									

Tech Level Effect = Plus 10% x Source TL - Market TL

Total Price

ACTUAL VALUE

Flux	Value
-5	40%
-4	50%
-3	70%
-2	80%
-1	90%
0	100%
+1	110%
+2	120%
+3	130%
+4	150%
+5	170%
+6	200%
+7	300%
+8	400%

Less than -5 is -5.
More than +8 is +8.
DM + Broker/2 (to maximum +4).

For example,

A Free Trader has bought for speculation a cargo on Efate to sell on Alell. The cargo ID from Efate is D Hi In Cr 2,300 (=Cr3,000 - 1,000 - 1,000 plus TL Effect = 13 x 100 = 1,300 = Cr2,300).

He carries it to Alell B46789C-A Ri. It is priced at (Cr5,000 + [In> Ri] = +1,000 = 6,000) plus TL Effect (=13 - 10 = 3 x 10% x 6,000 = +1,800) = Cr7,800. These goods have a Price of Cr7,800.

The trader offers them on the market using the Actual Value Table and rolls 0 = 100%. The goods sell for Cr7,800 and a profit of Cr5,500 per ton.

The Free Trader buys cargo on Alell for sale on Uakye. The cargo ID from Alell is A Ri Cr2,300 (=Cr3,000 + 1,000 plus TL Effect = 10 x 100 = 1,000 = Cr5,000).

He carries it to Uakye B439598-D Ni. It is priced at (Cr5,000) plus TL Effect (=10 - 13 = -3 x 10% x 6,000 = -1,800) = Cr4,200. These goods have a Price of Cr4,200.

The trader offers them on the market using the Actual Value Table. He rolls the first die (= +1) and sees that the best value he can get for the goods is 100%. So he cancels the transaction and moves on to the next world.

He carries it to Efate A646930-D Hi In. They are priced at (Cr5,000 + [Ri>Hi, Ri>In = +2,000 = 7,000) plus TL Effect (=10 - 13 = -3 x 10% x 7,000 = -2,100) = Cr4,900. These goods have a Price of Cr4,900.

The trader offers them on the market using the Actual Value Table. This time he finds a Broker-4 to help him. He rolls on the Actual Value Table = +3 – 1 + 2 = +4. The Selling price is 150% of the Price = Cr7,350 (minus 20% commission = 1,470 =) Cr5,880. He makes a profit of Cr880 per ton.

Trade and Commerce

Carrying freight between worlds is the basis of interstellar commerce.

Trade-3

Directly create the Trade Classifications for a world without creating the UWP (if the situation will not otherwise use the UWP). The UWP can be laboriously created later if necessary.

Pick one of the two tables and roll 4D for the row followed by 1D for the column. The result is the Trade Classifications for the world.

WORLD TRADE CLASSIFICATIONS 1

4D	1	2	3	4	5	6
4	De Ba	De He Po	Fl Oc Di	Hi Ic In Va	De He Ba	De He Hi In Na Po
5	He Ba	De Hi In	As Va Ba	He Na Po Pi	De Hi Pr	De He Hi In Po
6	He Di	He Po Ba	Fl He Ba	De Na Po Pi	Ic Va Di	De He Na Ni Po
7	De Pi	Fl Oc Ph	De Po Di	He Na Ni Po	De He Hi	He Hi In Na Po
8	Fl Ba	Fl Hi Oc	De Ri Ph	De He Po Ba	Na Va Ph Pi	De Hi In Na Po
9	Di	De He Lo	Fl Wa Ph	De He Po Di	Hi In Na Va	Hi Ic In Na Va
10	Ag	Oc Ph Pi	Fl Hi Wa	Ic Na Ph Pi	Fl He Ni	As Hi In Na Va
11	Ri	Wa Ph	Na Pi	He Ni	Hi Po	Ni Oc
12	In	Fl Ni	Ni Pa	Hi In	Ic Va	Fl Lo
13	Ni	Ga	Va	Po	De Lo	Ri
14	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)
15	Lo	Ph	Wa	Pi	Ic	Fl
16	In	Lo Wa	Ni Va	Ag Pi	De Po	Lo Va
17	Po	Hi Pr	Na Ni	Pa Ph	Po Ph	Ri Wa
18	Na	Hi In Oc	Po Ph Pi	Hi Ic In Na	Ag Ni Ri Ga	As Na Va Ph Pi
19	Ba	De Po Ph	Hi In Po	Ri Ga Pa Ph	As Na Ni Va	Ic Na Va Ph Pi
20	Lo Oc	De Ni Ri	De Ni Pr	De Na Ni Po	De Po Ba	De Na Po Ph Pi
21	Fl Di	De Hi Po	Oc Ri Ph	Ic Na Va Pi	De He Ph	He Na Po Ph Pi
22	Oc Ba	He Po Di	Fl He Di	Ag Ni Ga Pr	Hi Oc Pr	De He Na Po Pi
23	Oc Di	De He Pi	As Va Di	As Na Va Pi	Ic Va Ba	De He Po Ph Pi
24	De Di	De Ph Pi	Fl Oc Ba	Ic Na Ni Va	De He Di	De He Na Po Ph Pi

WORLD TRADE CLASSIFICATIONS 2

4D	1	2	3	4	5	6
4	De Ph	Ni Oc Pr	Ri Pa Ph	Oc Pi	Fl Oc	De He Ph Pi
5	Oc Ph	Na Po Pi	De Lo Po	As Va	Wa Di	De He Po Pi
6	Ic Ba	Ni Oc Ri	Ni Ri Wa	Hi In Na	Po Pi	Na Po Ph Pi
7	Ic Di	Fl Lo Wa	Hi Wa Pr	Na Ni Po	Oc Ri	Hi In Na Po
8	Po Ba	De Po Pi	Fl Ni Oc	Ag Ri Ga	Ic Lo Va	De Hi In Po
9	Po Di	He Ph Pi	Ic Na Pi	Ic Na Ni	Ag Ni Pr	De Hi Na Po
10	Ga Ba	He Hi In	Fl He Lo	Ri Wa Ph	As Ni Va	Ic Va Ph Pi
11	Ga Di	Fl He Ph	Na Ph Pi	Fl He Ni	De Ni Po	Ri Ph
12	Na Po	Ic Lo	Fl Ph	Ic Pi	Fl He	Ic Ni
13	He Pi	Ag Ri	Ni Ri	Ni Wa	Ag Ga	Ag
14	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)
15	Ba	Di	De	He	Oc	Hi
16	Lo Po	Fl Hi	Wa Pi	De Ni	He Lo	Ni Po
17	Lo Ga	Ag Ni	Ph Pi	Hi Wa	Hi Ga	Ni Pr
18	Fl Wa	Hi Ic In	He Lo Po	Fl He Hi	Ag Ni Ri	He Hi In Po
19	Va Ba	Fl Lo Oc	Ag Ni Ga	Hi Ga Pr	Pa Ph Pi	He Po Ph Pi
20	Va Di	Fl Ni Wa	Ni Ga Pa	De Na Po	Ic Ni Va	De Na Po Ph
21	De Hi	Na Po Ph	Ni Wa Pr	De He Ni	As Lo Va	De Po Ph Pi
22	De He	He Po Pi	Na Va Pi	Ga Pa Ph	Na Ni Va	De He Ni Po
23	De Ri	Ic Va Pi	Wa Ph Pi	Ic Ph Pi	He Ni Po	De He Lo Po
24	Hi Oc	Hi Na Po	Hi In Wa	He Po	Wa Ba	De He Hi In

For example, Scout Eneri Dinsha discovers a new world.

To determine quickly what that world is, he decides to roll on Table 2. He rolls 4D for the row (= 4+3+5+1 = row 13) and 1D for the column (= 3 = column 3). He has discovered a Ni Ri Non-Industrial Rich world.

USING THESE CHARTS

These World Trade Classification Charts allow the random creation of TCs without the generation of complete world details or UWPs.

Trade in Uncharted Territory

For a trading ship travelling in unknown territory, these tables create potential Market Worlds.

Without fully creating UWPs, the Referee can present several possible worlds and allow the trader to make decisions about profitability.

Trading Maps. Any reasonable trader makes inquiries about what lies ahead. Those inquiries can produce trading maps (often sketched on the back of a napkin) showing a series of worlds and their TCs.

Character Homeworlds

Character homeworlds and birthworlds depend on TCs for the skills they confer. These charts create the essential TCs without fully detailing UWPs.

Destinations

Patrons and information sources often describe worlds based on their TCs.

Destination worlds can be defined using these charts.

Discoveries

A Scout Discovery can be quickly defined using these charts.

Land Grants

Noble Land Grants can be defined using these charts.

REVERSE WORLD CREATION

Worlds can be created based on their known TCs. The process of elimination determines which world details are available based on the TCs. Other details are selected or created.

The Trade Classifications

The key to trade is the broad array of trade classifications which distill the details of the Universal World Profile into easily understood two-letter codes. Understanding the trade classifications gives insight into the details of worlds.

The Trade Classifications are two-letter codes (with format: Capital-lower) which identify an important or unusual detail of the world. For example, Ba is the trade classification for Barren: a world with no population.

SEVEN TYPES OF TC

Trade Classifications fall into seven distinct categories: Planetary, Population, Economic, Climate, Secondary, Political, and Special.

As De He Fl Ic Oc Ga Va Wa

Planetary trade classifications are based on the UWP elements SAH and generally relate to physical aspects of the world.

Di Ba Lo Ni Ph Hi

Population trade classifications are based on the UWP Population and provide an insight into the current local population.

Pa Ag Na Pi In Po Pr Ri

Economic trade classifications are based on the UWP elements AHP and generally relate to economic aspects of the world.

Fr Tr Tu Tz

Climate trade classifications are based on the UWP elements SAH and take into account the world's relation to the Habitable Zone of the system.

Fa Mi

Secondary trade classifications are based on the UWP elements SAH and take into account the world's relation to the Habitable Zone of the system.

Cp Cs Cx Cy Pe Re

Political trade classifications detail aspects of interstellar government.

Fo Pz Da An Ab

Special trade classifications detail unusual world details.

USING TRADE CLASSIFICATIONS

Trade Classifications have several uses:

Trade. Some (but not all) Trade Classifications are used to evaluate the purchase cost and the selling price of trade goods.

Homeworld and Birthworld Skills. The trade classification for a world determine the skills a character receives during character generation because of his birthworld or homeworld.

Land Grant Income. The trade classifications for a world cumulatively determine the income which a Land Grant produces for its holder.

HOW MANY TCs FOR A WORLD?

When evaluating a world, generate all possible trade classifications.

Planetary, Population, and **Economic** Trade Classifications are dictated by the UWP elements; there is no random or discretionary choice involved.

Climate and **Secondary** Trade Classifications are dependent on the orbit of the world. They are imposed only if the entire star system is generated.

Political and **Special** Trade Classifications are discretionary. They are imposed by the referee based on his discretion or the situation.

In practice, most worlds have between one and three Trade Classifications. A world may have as many as five or six or more TCs. It is possible for a world to have no Trade Classifications.

TRADE CLASSIFICATION LIST

Code	Trade Classification
Ab	Data Repository
Ag	Agricultural
An	Ancient Site
As	Asteroid
Ba	Barren
Cp	Subsector Capital
Cs	Sector Capital
Cx	Capital
Cy	Colony
Da	Danger (Amber Zone)
De	Desert
Di	Dieback (000-T)
Fa	Farming
Fl	Fluid
Fo	Forbidden (Red Zone)
Fr	Frozen
Ga	Garden World
He	Hellworld
Hi	High Population
Ic	Ice-Capped
In	Industrial
Lo	Low Population
Mi	Mining
Na	Non-agricultural
Ni	Non-industrial
Oc	Ocean World
Pa	Pre-Agricultural
Pe	Penal Colony
Ph	Pre-High
Pi	Pre-Industrial
Po	Poor
Pr	Pre-Rich
Pz	Puzzle (Amber Zone)
Re	Reserve
Ri	Rich
Sa	Satellite
Tr	Tropic
Tu	Tundra
Tz	Twilight Zone
Va	Vacuum
Wa	Water World

TRADE CLASSIFICATIONS

The Trade Classifications Table indicates the required world UPP characteristics for each classification. Examine a world for all possible trade classifications.

Ab Ag An As Ba Cp Cs Cx Cy Da De Di Fa Fl Fo Fr Ga He Hi Ic In Lo

Ab Data Repository

The world has a centralized collection point for information and data. Governments, educational institutions, entertainment companies, corporations, and other organizations for parsecs in every direction deposit records of their transactions and output in this collection point.

The TC use refers to AAB, the Imperial designation for data repositories.

Ag Agricultural

The world has the proper climate and conditions which promote extensive farming and ranching. It is a producer of relatively inexpensive foodstuffs. It also is a source of unusual, exotic, or strange delicacies.

An Ancient Site

The world (or conceivably the star system) includes one or more locations identified as the ruins of the long-dead race called the Ancients. Ancient Sites are exploited for the Artifact remains of this long dead technological civilization.

As Asteroid Belt

The world is an asteroid belt which is the primary world or mainworld in the system. It is a producer of raw materials and semi-finished goods, especially ores, metals, and minerals.

Ba Barren World

The world has no population, government, or law level. It has never been developed; it has no local infrastructure beyond the starport (if that).

A Barren world UWP has a zero Tech Level.

Cp Subsector Capital

The world is the political center of a group of tens or dozens of star systems (typically a subsector).

Cs Sector Capital

The world is the political center of a group of hundreds of star systems (typically a sector).

Cx Imperial Capital

The world is the overall political center of an interstellar government controlling thousands of star systems.

Cy Colony

The world is a colony of another world (or of an organization).

The inhabitants of this world are called Colonists.

Da Dangerous

Some aspect of the world (conditions, customs, laws, life forms, climate, economics, or other) is not well understood or easily understood by typical visitors, and it presents a danger. The world is an Amber Zone.

De Desert World

The world has no open or standing water. This lack of water significantly reduces the level of agricultural development.

Di Die-Back

The world was once extensively settled and developed, but at some time in the last thousand years its inhabiting sophonts died out leaving behind the remnants of their civilization

A Die-Back world UWP has a non-zero Tech Level.

Fa Farming

The world has the proper climate and conditions which promote extensive farming and ranching. In addition, it is not a Mainworld and is in the Habitable Zone.

Farming is a rare substitute term for Agricultural.

Fl Fluid Oceans

The world's oceans are not composed of water. Non-water oceans may be valuable sources of raw materials for industry.

Fo Forbidden

Some aspect of the world (conditions, customs, laws, life forms, climate, economics, or other) presents an active threat to the health and well-being of individuals. The world is a Red Zone.

Fr Frozen

The world lies substantially beyond the Habitable Zone of the system (HZ+2 or greater) and environmental temperatures are well below the freezing point of many gases.

Ga Garden World

The world is hospitable to most sophonts. Its size, atmosphere, and hydrographic make it an extremely attractive world. A Garden World has a safe environment which does not require protective equipment for humans and sophonts which share the human environment.

He Hellworld

The world is inhospitable to most sophonts. Its size, atmosphere, and hydrographic make it an extremely unattractive world.

Hi High Population

The world's population is one billion or more (Pop = 9 or A). High population worlds, because of the economy of scale for production, produce quality inexpensive trade goods.

Ic Ice-Capped

The world’s water is locked in ice-caps.

In Industrial

The world has a strong manufacturing infrastructure and is a producer of many types of goods.

Lk Locked

The world is a satellite (in orbits Ay through Em) which is locked to the planet it orbits. A Locked satellite does not have a Twilight Zone; its day length equals the time it takes to orbit its planet.

Lo Low Population

The world has a non-zero-population less than 10,000. Low Population fluctuates wildly and may change significantly on a yearly (or less) basis.

Locals are Transients: merchants, corporate employees, military, security, or research personnel.

Mi Na Ni Oc Pa Pe Ph Pi Po Pr Pz Re Ri Tr Tu Tz Va Wa

Mi Mining

The world is the site of extensive mining and mineral resource exploitation. It is not a Mainworld and is located in a star system with an Industrial Mainworld.

Na Non-Agricultural

The world is unable to produce enough food agriculturally to feed its population; synthetic food production generally provides basic food needs.

Ni Non-Industrial

The world has a non-zero population, but it is in the relatively low range of more than 10,000 and less than one million.

Non-Industrial population can fluctuate, although not as wildly as on Low Population worlds. Generally the Non-Industrial trade classification remains constant and reflects the expected level of population.

The inhabitants of a Non-Industrial world are Settlers: individuals who maintain a permanent settlement which does not yet meet the criteria of Colony.

Oc Ocean World

The world surface is covered with very deep seas. There is no (= less than 1%) land above the ocean surface.

Pa Pre-Agricultural

The world is a candidate for the Agricultural trade classification; its population is just outside the requirement for Agricultural.

Pe Penal Colony

The world is a dumping ground for individuals who do not (cannot / will not) conform to acceptable standards of behavior.

Ph Pre-High

The world is a candidate for elevation to the High Population trade classification; its population level is just below the requirements for High.

Pi Pre-Industrial

The world is a candidate for the Industrial trade classification; its population is just below the requirements for Industrial.

Po Poor

The world has poor grade living conditions: a scarcity of water and a relatively sparse atmosphere.

Pr Pre-Rich

The world is a candidate for the Rich trade classification; its population is just outside the requirements for Rich.

Pu Puzzle

Some aspect of the world (conditions, customs, laws, life forms, climate, economics, or other) is not well understood or easily understood by typical visitors. The world is an Amber Zone.

Re Reserve

The world has been set aside by the highest levels of government to preserve some aspect of its indigenous life forms, to delay development of its resources, to frustrate investigation of some aspect of the world, or to prevent exploitation of the world by outside organizations.

Ri Rich

The world has an untainted atmosphere which is comfortable and attractive for most sophonts, and has a population suitable as a workforce.

Sa Satellite

The world is the satellite of a planet (or gas giant) in the system.

Tr Tropic

The world is relatively warmer than normal (although it is considered habitable). Its orbit is at the inner (warmer) edge of the Habitable Zone. The world has a Hot climate (at the upper limits of human temperature endurance).

Tu Tundra

The world is relatively colder than normal (although it is considered habitable). Its orbit is at the outer (colder) edge of the Habitable Zone. The world has a Cold climate (at the lower limits of human temperature endurance).

Tw Twilight Zone

The world is tidally locked with a Temperate band at the Twilight Zone, plus a Hot region (hemisphere) facing the Primary and a Cold region (hemisphere) away from the Primary.

Va Vacuum World

The world has no atmosphere.

Wa Water World

The world surface is covered with water; there is very little land (= less than 10%) above the water surface.

Terminology

Asteroid Belt. A series of small fragments orbiting a star and which is considered a mainworld.

Belt. An asteroid belt.or a planetoid belt.

Habitable Zone. The orbit (or orbits) around a star which allow produce local world temperatures and conditions conducive to human (or similar sophont) habitation.

Mainworld. The principal or primary or most important world in a star system. The Mainworld may be a planet or a satellite or an asteroid belt.

Planet. A world orbiting a star.

Planetoid Belt. A series of small fragments orbiting a star. A planetoid belt which is a mainworld is called an asteroid belt.

Satellite. A world orbiting a planet.

World. A planet or a satellite.

Random Trade Goods

Most Trade Goods can be created using this chart based on the Trade Classifications of the world.

Random Trade Goods 1

TRADE GOODS DETAIL

As	[ ]
Ba	Gathered
De	Mineral
Di	Artifact
Fl	Unusual
Ga	Premium
Hi	Processed*
Ic	Cryo
Lo	[ ]
Ni	Unprocessed
Po	Obscure
Ri	Quality
Va	Exotic **

* Omit for Industrial
** Omit for Asteroid

Ag-1

1 Raws

1	Bulk Protein
2	Bulk Carbs
3	Bulk Fats
4	Bulk Pharma
5	Livestock
6	Seedstock

2 Rares

1	Fine Furs
2	Meat Delicacies
3	Fruit Delicacies
4	Candies
5	Textiles
6	Exotic Sauces

3 Consumables

1	Flavored Waters
2	Wines
3	Juices
4	Nectars
5	Decoctions
6	Drinkable Lymphs

4 Pharma

1	Health Foods
2	Nutraceuticals
3	Fast Drug
4	Painkillers
5	Antiseptic
6	Antibiotics

5 Novelties

1	Incenses
2	Iridescents
3	Reflectives
4	Pigments
5	Noisemakers
6	Soundmakers

6 Imbalances

1	He
2	Hi
3	In
4	Na
5	Ri
6	Va
	Wa

Ag-2

1 Raws

1	Bulk Woods
2	Bulk Pelts
3	Bulk Herbs
4	Bulk Spices
5	Bulk Nitrates
6	Foodstuffs

2 Rares

1	Spices
2	Organic Gems
3	Flavorings
4	Aged Meats
5	Fermented Fluids
6	Fine Aromatics

3 Consumables

1	Flowers
2	Aromatics
3	Pheromones
4	Secretions
5	Adhesives
6	Novel Flavorings

4 Pharma

1	Antifungal
2	Antiviral
3	Panacea
4	Pseudo Hormones
5	Anagathics
6	Slow Drug

5 Novelties

1	Strange Seeds
2	Motile Plants
3	Reactive Plants
4	Reactive Woods
5	IR Emitters
6	Lek Emitters

6 Imbalances

1	De He Hi
2	Fl Hi
3	Fl Hi In
4	Na Ni
5	De Po
6	Ni Va
	Oc

As

1 Raws

1	Bulk Nitrates
2	Bulk Carbon
3	Bulk Iron
4	Bulk Copper
5	Radioactive Ores
6	Bulk Ices

2 Rares

1	Gemstones
2	Alloys
3	Iridium Sponge
4	Lanthanum
5	Isotopes
6	Anti-Matter

3 Valuta

1	Platinum
2	Gold
3	Gallium
4	Silver
5	Thorium
6	Radium

4 Samples

1	Ores
2	Ices
3	Carbons
4	Metals
5	Radioactives
6	Silicates

5 Novelties

1	Unusual Rocks
2	Fused Metals
3	Strange Crystals
4	Fine Dusts
5	Magnetics
6	Light-Sensitives

6 Imbalances

1	Hi In
2	Na Ni
3	He
4	Va
5	Po
6	Ri
	Wa

Random Trade Goods

Most Trade Goods can be created using this chart based on the Trade Classifications of the world.

Random Trade Goods 3

TRADE GOODS DETAIL

As	[ ]
Ba	Gathered
De	Mineral
Di	Artifact
Fl	Unusual
Ga	Premium
Hi	Processed*
Ic	Cryo
Lo	[ ]
Ni	Unprocessed
Po	Obscure
Ri	Quality
Va	Exotic **

* Omit for Industrial
** Omit for Asteroid

Na

1	Raws	
1		Bulk Abrasives
2		Bulk Gases
3		Bulk Minerals
4		Bulk Precipitates
5		Exotic Fauna
6		Exotic Flora
2	Rares	
1		Hummingsand
2		Masterpieces
3		Fine Carpets
4		Isotopes
5		Pelts
6		Seedstocks
3	Novelties	
1		Branded Tools
2		Drinkable Lymphs
3		Dupe Masterpieces
4		Pattern Creators
5		Pigments
6		Warm Leather
4	Samples	
1		Archeologicals
2		Fauna
3		Flora
4		Minerals
5		Ephemerals
6		Polymers
5	Uniques	
1		Masterpieces
2		Unusual Rocks
3		Artifacts
4		Fine Art
5		Replicating Clays
6		ANIFX Emitter
6	Imbalances	
1		Ag
2		Ri
3		In
4		Ni
5		De
6		Ga

In

1	Manufactureds	
1		Electronics
2		Photonics
3		Magnetics
4		Fluidics
5		Polymerics
6		Gravitics
2	Manufactureds	
1		Biologics
2		Mechanicals
3		Textiles
4		Weapons
5		Armor
6		Robots
3	Scrap / Waste	
1		Obsoletes
2		Used Goods
3		Reparables
4		Radioactives
5		Metals
6		Sludges
4	Pharma	
1		Nostrums
2		Restoratives
3		Palliatives
4		Suppressants
5		Antibiotics
6		Antiseptics
5	Data	
1		Software
2		Databases
3		Expert Systems
4		Upgrades
5		Backups
6		Raw Sensings
6	Consumables	
1		Disposables
2		Branded Drinks
3		Branded Foods
4		Branded Clothes
5		Parts
6		Improvements

Po

1	Raws	
1		Bulk Nutrients
2		Bulk Fibers
3		Bulk Organics
4		Bulk Minerals
5		Bulk Textiles
6		Exotic Flora
2	Rares	
1		Gemstones
2		Antiques
3		Collectibles
4		Allotropes
5		Spices
6		Seedstocks
3	Novelties	
1		Strange Crystals
2		Strange Seeds
3		Dupe Masterpieces
4		Emotion Lighting
5		Silanes
6		Flora
4	Uniques	
1		Masterpieces
2		Incomprehensibles
3		Antiques
4		Exotic Flora
5		Fossils
6		VHDUS Emitter
5	Entertainments	
1		Art
2		Recordings
3		Writings
4		Tactiles
5		Osmancies
6		Wafers
6	Imbalances	
1		In
2		Ri
3		Fl
4		Ic
5		Ni
6		He

Random Trade Goods

Most Trade Goods can be created using this chart based on the Trade Classifications of the world.

Random Trade Goods 4

TRADE GOODS DETAIL

As	[ ]
Ba	Gathered
De	Mineral
Di	Artifact
Fl	Unusual
Ga	Premium
Hi	Processed*
Ic	Cryo
Lo	[ ]
Ni	Unprocessed
Po	Obscure
Ri	Quality
Va	Exotic **

* Omit for Industrial
** Omit for Asteroid

Ri

	1 Raws	2 Rares	3 Consumables	4 Novelties	5 Uniques	6 Entertainments
1	Bulk Foodstuffs	Delicacies	Branded Foods	Echostones	Antique Art	Art
2	Bulk Protein	Spices	Branded Drinks	Self-Defenders	Masterpieces	Recordings
3	Bulk Carbs	Tisanes	Branded Clothes	Attractants	Artifacts	Writings
4	Bulk Fats	Nectars	Flavored Drinks	Sophont Cuisine	Incomprehensibles	Tactiles
5	Exotic Flora	Pelts	Flowers	Sophont Hats	Meson Barriers	Osmancies
6	Exotic Fauna	Seedstock	Music	Variable Tattoos	Famous Wafers	Wafers

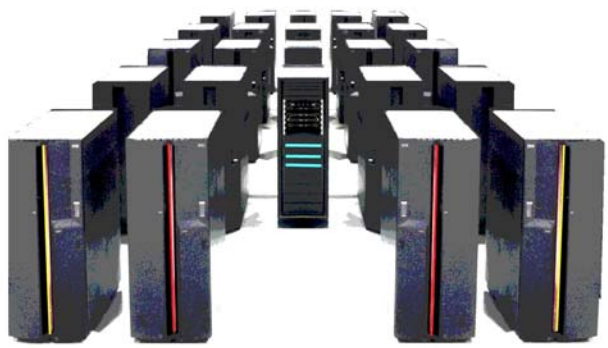
Va

	1 Raws	2 Rares	3 Consumables	4 Novelties	5 Samples	6 Scrap / Waste
1	Bulk Dusts	Vacc Gems	Branded Oxygen	Branded Vacc Suits	Archeologicals	Obsoletes
2	Bulk Minerals	Unusual Dusts	Vacc Suit Scents	Awareness Pinger	Fauna	Used Goods
3	Bulk Metals	Insulants	Vacc Suit Patches	Strange Seeds	Flora	Reparables
4	Radioactive Ores	Crafted Devices	Branded Tools	Musical Instruments	Minerals	Radioactives
5	Bulk Particulates	Rare Minerals	Holo-Companions	Unusual Minerals	Ephemerals	Metals
6	Ephemerals	Catalysts	Flavored Air	Exotic Crystals	Polymers	Sludges

Cp

	1 Valuta	2 Rares	3 Consumables	4 Novelties	5 Data	6 Red Tape
1	Coinage	Monumental Art	Branded Clothes	Incenses	Software	Regulations
2	Currency	Holo Sculpture	Branded Devices	Contemplatives	Expert Systems	Synchronizations
3	Money Cards	Collectible Books	Flavored Drinks	Cold Welders	Databases	Expert Systems
4	Gold	Jewelry	Flavorings	Polymer Sheets	Upgrades	Educationals
5	Silver	Museum Items	Decorations	Hats	Backups	Mandates
6	Platinum	Wines	Group Symbols	Skin Tones	Raw Sensings	Accountings

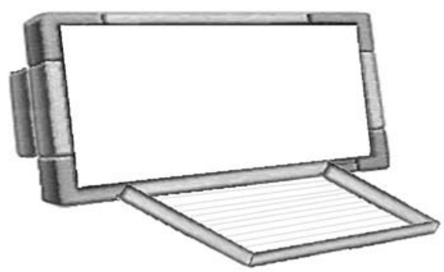
Computers and Brains



Zirunkariish Model/5

Zirunkariish

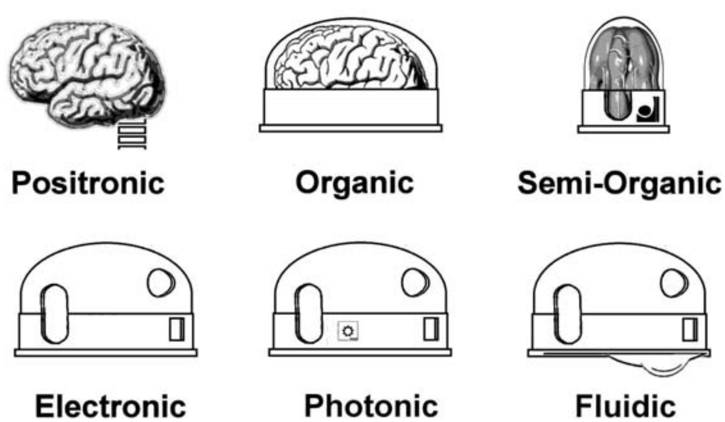
Computer Model/1
Computer Model/1bis
Computer Model/2
Computer Model/2bis
Computer Model/3
Computer Model/4
Computer Model/5
Computer Model/6



Zirunkariish “Universal” Console

Zirunkariish

Display Console
With Touch Pad,
Voice Input,
View Screen.



Zirunkariish Robotics

Zirunkariish

P1-Positronic Brain-12
Organic Brain in Case
S1-Semi-Organic Brain-11

System Process- Electronic
System Process- Photonic
System Process- Fluidic

Zirunkariish

Quality Computronics Since 143

Registration 5028-191. Authorized.

Computers and CyberSpace

Cyberspace -- the computing space within computers -- is awash with operating applications, maintenance activities, applets, and even occasional personalities.

Once computer and brain circuitry reaches a threshold level of sophistication, the computing space becomes an environment in which packages of software move and perform their functions.

The internal operations of computers are (in most cases) transparent to the user. Data is input into the computer, processed into information, and ultimately output.

Inside The Computer. The environment inside the computer becomes important with the advent of artificial intelligences and recorded personalities. Personalities and artificial intelligences are basically programs that can move through circuitry and networks.

The Cyberspace Metaphor. Given their size and sophistication, this interior computation circuitry of computers and networks can be best understood as a broad space, marked off into locations and bounded by barriers.

THE CHARTS

The four computer-related charts show the basic structure and operation of computers.

Chart 1. Computers.
Chart 2. Processes.
Chart 3. Applets.
Chart 4. Personalities.

UNDERSTANDING COMPUTERS

The physical device is the Computer: a set of electronic (or photonic or positronic or fluidic) circuits which process data according to some set of instructions.

A Computer has an Architecture: an internal structure of cells and connections which governs its operations.

Types of Computers

Computers are identified by the basic principles of their operation.

Electronic Computer. A Computer using electronic circuits. Electronic Computers are by far the most commonly encountered type.

Photonic Computer. A Computer using photonic or fiber optic circuits. Photonic Computers are resistant to EMP Effects, have lower power requirements, and have reduced waste heat output when compared to Electronic Computers.

Fluidic Computer. A Computer using gas or liquid flow circuits. Fluidic computers are resistant to EMP Effects, have lower power requirements, and have reduced waste heat output when compared to Electronic Computers. They are sensitive to temperature variations.

THE ELEMENTS OF CYBERSPACE

Delving deeper into Computers reveals their internal structure: Cyberspace. Cyberspace is a set of interconnected cells (locations) for operating computer programs, processes, applets, and data streams.

Users. People outside the computer system who use the computer though control consoles are Users.

Cells. The foundation of Cyberspace is its structure of cells. Each cell is a location for an activity within the computer. A map of the cells in a computer draws each location and shows connections between them. The (and map draws a square (or other polygon) grid showing the computer's total number of cells; sides which touch are connected.

Processes. Some cells are permanently occupied by Processes. A process is a large-scale program dedicated to a specific activity. Starship Life Support is a process in the starship's computer.

Applets. In contrast to Processes, Applets are small, temporary, mobile programs which roam throughout the computer. Applets perform many maintenance and protection functions. A Courier Applet carries targeted data messages between processes. A Censor evaluates data streams and applets for malware.

Data Streams. The underlying circuitry carries a continual flow of data streams between processes. This flow is constant as long as the computer is operating, and for all practical purposes invisible.

Connectors. The lines linking computers are Connectors: they may be wired or wireless.

Programs. For terminology purposes, Processes and Applets are both Programs.

Priority

Every Process and Applet within the computer has a Priority: a number which shows its relative importance in the overall hierarchy of the computer.

Under normal circumstances, Priority is a number from 1 to 6.

Moving In Cyberspace

Processes are immobile, being assigned more or less permanent locations within the grid of cells.

Applets roam at will within the computer, subject to specific limits:

Applets may move without limit through empty cells, or through any Process or Applet with a lower Priority.

An Applet stops when it moves next to a Program with equal or higher priority. Applets with equal Priority can never move into the same Cell.

An Applet which stops in a cell with a Program with lower Priority stops that Program for as long as they both occupy the same cell.

An Applet which may move onto a Connector, at which point it ends movement for the current turn. It begins its next turn of movement at the other end of the connector.

Stacking In A Cell. A cell can contain one Process and any number of Applets as long as each program has a different Priority (and only the highest Priority program can be functional).

IFFN Identification Friend or Foe or Neutral

All Programs native to a specific computer (or network) carry a visible IFFN Tag which identifies them as Friend. Programs with strange or unrecognized Tags are identified as Foe.

Friends are ignored by Friends unless they initiate attacks; Foes are automatically attacked.

Ignore. Some tags indicate the Program is Neutral and should be ignored unless it starts to overload the system.

Neutrals normally roam freely within cyberspace. If too many Neutrals are present and begin to overload the system, settings may change to exclude or destroy Neutrals. This is all much more Complex, with safeguards, encrypted identifications, and other details.

Conflict in Cyberspace

Programs can come into conflict with other Programs:

Processes are passive; they cannot attack other Processes or Applets. They depend on protective Applets to defend them.

Some Applets can destroy Processes using their available skill sets. An Applet can destroy one Program per turn (as the last activity in the turn).

Any Applet can attack any other Applet to which it is adjacent.

Applet Conflict. When applets clash, they resolve the conflict through comparison of assets. The applet with the greater assets prevails (tied applets are immobilized). A losing applet is destroyed.

Applet1 Assets	vs	Applet2 Assets
C4+C5+C6+ Priority + Skills	**vs**	**C4+C5+C6+ Priority + Skills**

If AI or Personality: Add Good Flux.

APPLET TYPES

Type	Description
Cleaner	Clears obsolete or useless code.
Fixer	Repairs chance variations or faults.
Phage	Destroys malware.
Courier	Carries internal messages and data..
Popup	Carries messages to outputs.
Censor	Evaluates all Applets passing through it.
AI AyEye	Artificial Intelligence.
Personality	Recorded organic personality.
Virus	Creates applets from within a Process.

UNDERSTANDING APPLETS

An **Applet is** mobile programming that performs support, maintenance, and internal housekeeping functions. Applets roam from location to location, cleaning out vacated locations, searching and destroying malware, and transporting priority data across networks.

Applets are rudimentary personalities with relatively low intelligence and relatively simple missions.

Applets are created and erased as needed.

For example, a priority message must be transmitted to another computer. The originating process creates (spawns?) an applet around the message and sends it on its way. This specific applet travels through the circuitry, attached networks, as a transmission, or even in a wafer or chip, until it ultimately reaches its destination. Recognition codes within the applet confirm the destination and deliver the message.

THE ELEMENTS OF THE APPLET

C4	Intelligence
C5	Education or Training or Instinct
C6	Social Standing or Charisma (but not Caste)
CS	Sanity
	A limited set of Skills or Knowledges or Talents
	A set of unique Memories
	A sense of Purpose and of Self (including IFFN).
	Special Features: Priority. Expiration

Characteristics. An Applet may have one or more characteristics C4 C5 C6.

Sanity. An Applet may malfunction if it fails a Sanity Check.

Skills. An Applet may have one or more skills; usually a specialized Applet skill.

Memories. An Applet has Memories and is able to interact with other applets about them.

Purpose. An Applet has a sense of Purpose, usually hardwired, associated with its activities. The Applet has a sense of Self, including an ability to identify and be identified as a friend or foe (or neutral).

Priority. An Applet has a Priority established when it is created.

Expiration. An Applet has an Expiration and it dissolves when this date is reached.

Applet Duplication

Applets are self-directed and self-duplicating.

Any Applet may make identical duplicates of itself (the number it can make is equal to its Priority), but each duplicate is Priority one lower.

Applet Skills

An Applet is created with one skill (usually no more) which supports its mission or function.

Clean (Cleaner, Maintenance) is the ability to identify and erase obsolete or useless code, applets, or processes. Applets with Clean roam through cyberspace examining applets, processes, and data streams for expiration dates and faulty diagnostics. Those that it finds, it shreds, leaving behind empty cells.

Fix (Fixer, Repair) is the ability to identify minor software malfunctions and repair them. Applets with Fixer roam through cyberspace performing diagnostics for applets, processes, and data streams: when faults are found, they are repaired (if possible): expiration dates are reset, checksums repaired, software structures are reset to their original state.

Defend (Defender, Protect) is the ability to identify Foe (as defined by IFF) Applets and Processes and attack and destroy them. Applets with Defender roam through cyberspace examining the IFF status of applets and destroying those that cannot be verified as Friendly.

Destination (Goal) is the ability navigate through cyberspace to an identified destination. Applets with Destination travel through cyberspace to an assigned Process in order to deliver a packet of information essential to that Process. A destination is not necessarily in the current computer or even the current network.

An Applet with Destination is a Courier.

Destination is distinct from Output, which is associated with carrying information to an assigned Output device.

Output is the ability to navigate through cyberspace to an identified output device. Applets with Output travel through cyberspace to an assigned Output device to deliver a packet of Output intended for display to a user. The output device is not necessarily in the current computer or even the current network.

An Applet with Output is a Popup.

Output is distinct from Destination, which is associated with carrying information to an assigned Process.

Censor (Anti-Virus, Anti-Malware) is the ability to evaluate all applets and data streams it encounters searching for malware (and especially for viruses).

An Applet with Censor repeatedly cycles its Priority 6-5-4-3-2-1-6.

Stealth (Clandestine) is the ability to conceal oneself from the evaluations and diagnostics of others. An Applet with Stealth can ignore evaluations by Clean, Fix, Defend, or Censor if its Stealth is greater than the opposing skill.

Programmer (Coding, Coder) is the ability to edit the software elements of Processes and Applets (including the elements of the Applet using the skill). Programming does not allow creating new code; the specific values required must be taken from (cut and pasted) other Applets in the same cell (including from oneself).

Programmer is not a skill generally available to created Applets; it is brought into an Applet through a Personality. For example, Eneri Dinsha, Programmer-4, records his personality; when it sends it into cyberspace, one of its available skills is Programmer-4.

For Example,

An Applet is generated with Clean. The Applet is a Phage, devoted to eating obsolete or expired code fragments. It located and attacks Applets which have passed their expiration date.

An Applet is generated with Fix. The Applet is a Fixer with a minor repair function: it roams in search of minor software flaws and repairs them.

An Applet is generated with Defend. The Applet is a Defender dedicated to seeking out and destroying Applets which fail an IFFN test.

An Astrogation Process generates an Applet with Destination Jump Drive Processor and is given a packet of data calculations about an upcoming Jump. The Courier Applet is a courier which makes its way through the on-board network to the Jump Drive Processor and delivers its packet (the Jump Drive Processor may generate its own Courier with an acknowledgement).

An Jump Drive Processor (having just received its data packet about an upcoming jump) generates an Applet with Output directed toward the Astrogator Display Console. The Popup travels through the network to the ADC and notifies the astrogator that all is ready for the upcoming jump.

An Applet is generated with Censor. The Applet stations itself in a cell through which many Applets must pass (and which cannot be bypassed). A passing Popup is forced to stop when it moves adjacent to the higher priority Censor, which then evaluates it for malware. The Popup passes the evaluation; the Censor momentarily drops its Priority and the Popup proceeds on its way.

DATA PACKETS

A Data Packet is an encapsulated (in an Applet) set of data or information. It may be generated by a Processor or by a User.

Internal Data is basic output from one processor intended to be used as input by another processor. An Astrogation Processor outputs a data packet (calculations about an upcoming jump) and sends it to the Jump Drive Processor.

Internal Data is carried by Courier applets.

Console Output is information (progress reports, query responses, messages, emails) intended for display on a control console to be read (viewed, heard) by a User.

Console Output is carried by Popup Applets.

Virus is a set of Applet-producing instructions concealed within a Data Packet. Upon delivery to a Processor, the Data Packet tricks the Processor into creating the specified Applet (or great numbers of the Applet, or many different Applets).

The Xmail System

Some versions of the Xmail System use Neutral Output Applets. A message to a specific person is inserted into the Applet and thousands of copies are sent into the xmail system, carried by ships to hundreds of worlds.

When the recipient arrives on one of those worlds and checks an xmail terminal, his specific message pops up on the display console.

PERSONALITIES AND ARTIFICIAL INTELLIGENCES

A person can insert his Personality into a computer: special software wraps it in an Applet which enters the computer.

A person can establish a feedback loop with his Recorded Personality as it is run on a Computer and monitor its activities. The resulting effect is that the person feels like he is in the computer (the term is **jacked in**).

Jacking In. To monitor the activities of a Recorded Personality being run on a Computer, a person establishes a connection between his Wafer Jack and the computer.

When the person disconnects, the Recorded Personality continues in the computer until it dissipates.

The Personality

A Personality accurately reflects the characteristics of the User. The Applet is, in effect, the person, now inside the computer.

Artificial Intelligences

Some Personalities are artificially created.

WHAT CYBERSPACE LOOKS LIKE

At its simplest, cyberspace is sparse and bare; its locations filled with heaps of pulsating processes, and glowing streams of data flowing between them.

Skins. Personalities ranging through cyberspace may adopt their own favorite filters through which to view their surroundings:

Prehistoric Landscapes littered with valuable gems and roamed by dinosaurs.

Medieval landscapes filled with castles, towns, and villages, and threatened by dragons, plague, and random storms.

Contemporary Interplanetary Space populated by planets and satellites and swept by stellar flares and radiation storms.

But in each Skin, the elements are the same: locations which process data, operating stationary processes, and roaming applets performing a variety of functions.

Internal Architecture. The environment within cyberspace is a broad plane of locations arranged in a regular pattern. Each location has a distinct number of connections to neighboring locations. This number identifies its architecture.

For example, Architecture-4 indicates each location has four connections to adjacent locations (which is a square grid). Architecture-6 indicates six connections (which is a hexagon grid). Any number of connections are possible, although Architecture 1 and Architecture-2 appear to be impractical.

Many substantial variations of Architecture are possible:

The edges of the plane may wrap (like a cylinder) or the plane may be the surface of a sphere.

Locations may have varying or random numbers of connections.

Y-Connectors and X-Connectors linking locations with multiple other locations

Standard Imperial Computer Architecture is a compact bounded flat plane with a square grid.

POSITRONIC BRAINS

Positronic brains begin as blank slates. A positronic brain is activated, giving it consciousness and self-awareness. It is immediately connected to a flash learning system which floods the brain with information and the techniques and abilities to use it.

In a matter of weeks, the brain has reached the equivalent of Life Stage 3 and is ready to be installed in a robot body.

Cannot Be Recorded or Overlaid. A positronic brain is dependent on the random structure of the noble metal sponge. Its personality can be imitated (by an expert system), but it cannot be recorded. Personalities cannot be overlaid on it or implanted.

MISSILE BRAINS

Missiles can be equipped with a variety of guidance and control systems.

Hardwired (C+S)= 5

The Missile is hardwired with a rudimentary decision-making systems. It operates independently once launched.

Minimum Missile Size = 3.

Operator Guided (C+S)= Operator

The Missile is guided by a Gunner in the launching Mount.

The Missile takes its C+S from the Characteristic and Skill of the Operator.

Distance Effects. Guidance by an Operator at a distance ultimately declines in quality. (C+S) is modified by minus World Range (R=). If (C+S)-R becomes less than 5, the Missile reverts to Hardwired (C+S)=5.

Attention Effects. The Operator must be participating in the Guidance process when the missile attacks. If not, the Missile reverts to Hard-Wired (C+S)=5.

Minimum Missile Size = 4.

Self-Aware (C+S)= varies

Self-Aware missiles are equipped with a Brain (Electronic, Positronic, Semi-Organic, usually not Organic) which operates the missile and guides it to its target.

Self-Aware Brains are constantly fed sensor data about the current ship's position and the location of other ships and targets in the area. When in jump, the Brains are fed random situations and information.

The Brains are constantly gaming the information, competing with each other for high scores and other rewards.

Although Missile Brains communicate with each other, there are no communications channels with the ship or crew; it is important that Brains never learn that, when actually deployed, the end of the mission is final.

Self-Aware Missiles self-destruct if their mission is unsuccessful.

DataCasters. One purpose of DataCasters is to communicate with Self-Aware Missile Brains. Success shocks the Brain into inaction or even to turning on its launchers.

Self-Aware (C+S). C+S for a Self-Aware Missile is determined at the time of Launch

C= 6 + 1D
S= 1D
Plus Flux.
Minimum Missile Size = 5.

DownLoad. A Missile Gunner can DownLoad his Personality into a Missile (or several missiles) and send them on their way.

Each missile is guided by the personality of the Operator (which would dissipate anyway after several days).

Minimum Missile Size = 5.

Eneri Dinsha Drives Across The Continent

For example, Eneri Dinsha is driving a GroundCar. There is a computer in place between the controls and the vehicle itself. That computer may include sophisticated braking features; finely tuned reactive suspension, and an array of console information. Nevertheless, driving tasks are resolved using Eneri's characteristic and skill.

For example, Eneri Dinsha is driving a GroundCar equipped with a computer which has a P0 Positronic Brain as its System Process (but not a Component process). Eneri starts to fall asleep at the controls; the On Board Brain senses his erratic driving and speaks to him: "Alert! Your driving is erratic!".

For example, Eneri Dinsha is driving a GroundCar equipped with a computer which has a P0 Positronic Brain as its System Process, and with a Vehicle Component Process. Eneri starts to fall asleep at the controls; the On Board Brain senses his erratic driving and takes over the controls. Since a P0 has Int=1 and Vehicle-1D (=4), it isn't a very good driver, but it can at least pull the vehicle to the side of the road, crank up the heating system, and flash the interior lights to

get Eneri's attention: "Alert! You were driving erraticly. You should get some sleep before we continue."

Finally, for example, Eneri Dinsha is driving a GroundCar equipped with a computer which has an S2 Semi-Organic Brain (Int=2D, Skill=2D) and a Vehicle Component Process. Eneri starts to fall asleep at the controls. The On Board Brain senses his erratic driving and takes over the controls, driving the vehicle through the night. Eneri wakes up in the morning as the vehicle is just arriving at its destination.

CYBERSPACE AND SPACE COMBAT

Resolving conflict in CyberSpace during space combat is overlong and distracting. Instead, use the following:

A Virus successfully introduced onto a ship disables the Component at the Hit Location.

In each successive Combat Round, the Virus may attack an adjacent Hit Location and succeeds if 1D < Computer + Virus.

For example, a Virus is assigned a value = 1D = 3. It attacks an adjacent Hit Location Power Plant controlled by Computer/2. It must roll 1D for 2+3 or less = 5. If successful, that location is disabled.

A Virus is isolated if all computer connections are cut between the Virus disabled locations and all other hit locations.

Computers

Computers fill a variety of roles in the control of equipment, vehicles, and the processes of industry and bureaucracy. Computers operate in a number of ways to complement, supplement, supplant, or replace active intelligent control or supervision.

THE SHIP'S COMPUTERS

Select a master Ship's Computer.
Install it on the Bridge.
Note the Local Computers for each of the Major Components.
Create the Local Network.

THE SHIP'S COMPUTER

Every ship has a master Ship's Computer located on the Bridge. It networks with the many Local Computers throughout the ship.

Local Computers. Every major component has its own Local Computer managing its activities and operation.

The Standard **Local Computer** is a Model/2 loaded with a Console System Process and the appropriate Component Process.

Major Components

Each item in these categories is a Major Components and has a Local Computer.

- Drives
- Power Plants
- Sensors
- Weapons
- Defenses

Computers are identified by Model, and distinguished by TL, Cells, and Cost.

Cells. Computer capacity is measured in Cells. One cell can contain one Process. A system operates most efficiently if free Cells equal installed Processes.

Computer Tonnage. Computers are not all that big: one Cell is a Lan, or about 100 Cells per ton. Model/5 and lower is dwarfed by its control console (which is about one Deck Square).

Brain Tonnage. Brains are installed in an existing Cell, so while the Brain itself is about 1 or 2 liters, it is part of a larger Cell.

COMPUTER CONCEPTS

Cells hold Processes. The ship's computer network needs enough cells to hold all of its software processes.

Free Cells enhance efficiency. Empty cells help a computer process more rapidly.

COMPUTERS

M	Stage	Model	TL	=	Cells	KCr	Tonnage
0		Model/0	5	2^0	1	100	
1		Model/1	6	2^1	2	200	Console
1b		Model/1 bis	7	2^1+1	3	300	Console
2		Model/2	7	2^2	4	400	Console
2b		Model/2 bis	8	2^2+1	5	500	Console
3		Model/3	9	2^3	8	800	Console
3b		Model/3 bis	10	2^3+1	9	900	Console
4		Model/4	10	2^4	16	1600	Console
5		Model/5	11	2^5	32	3200	Console
6		Model/6	12	2^6	64	6400	1 ton
7		Model/7	13	2^7	128	12800	2 tons
8		Model/8	14	2^8	256	25600	3 tons
9		Model/9	15	2^9	512	51200	5 tons
Ex	Experimental (= Full QREBS)		-3			x 10	x 3
Pr	Prototype (= 3 of 5)		-2			x 3	x 2
Ea	Early (= 1 of 5)		-1			x 2	
Im	Improved (= +1 of 5)		+1			/ 2	
Adv	Advanced (= +3 of 5)		+2			/ 2	
	Fiber Optic	fib	+1			x 1.5	x 2
	Photonic	phot	+3			/ 2	
	Fluidic	flu	+4			x 2	x 2
	Neural Network	neu	+5			x 2	

M. The model number or variant suffix for the computer.
Stage. The technological development stage for the computer.
Model. The standard model name for the computer (bis = second or enhanced).
TL. The tech level of the computer.
=. Shows the formula for computing the number of cells based on Model.
Cells. The number of internal computer operating cells. Each cell holds a process.
KCr. Computer cost.
Tonnage. The ship tonnage requires for the computer.

NETWORK UPGRADES

Upgrade	Status	=
Hardwire Connections	Standard	
Fiber Optic Connections	Standard for fib	
Photonic Connections	Standard for phot	
Fluidic Connections	Standard for flu	
Neural Connections	Standard for neu	
Specific Links Cut	Upgrade	
Wireless Connections	Upgrade	

Default Network. All Local Computers and the Master Computer are default hardwire networked with each other. Upgrade the Network as desired.

Software

The heart of the computer is its software. Each major component and many housekeeping functions are managed by computers controlled by Processes dedicated software packages that relieve people of the burden of day-to-day activities.

COMPUTER PROCESSES

The software that drives a computer is the Process. Each Process addresses a specific function and manages it within the computer.

There are three types of Processes:

System. The Operating System for a Computer. Every Computer requires an Operating System Process.

Component. The governing Process for a Component.

Service. A Process providing support or information.

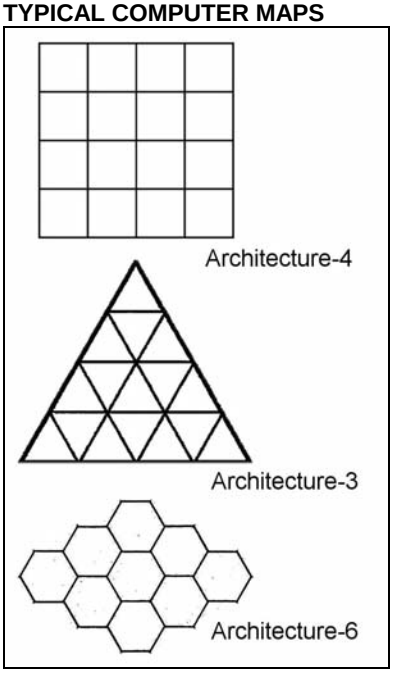
Redundant

Three identical Processes allow a Computer to automatically ignore a computing failure by one of the three.

Brain Tonnage. A Brain is installed in an existing Cell, so while the Brain itself is about 1 or 2 liters, it is part of a larger Cell.

Free Cells. A system operates most efficiently if it has free Cells equal to installed Processes. If the Computer has fewer than one empty cell per operating Process, output is delayed one Round.

TYPICAL COMPUTER MAPS



SYSTEM PROCESSES

M	Type	Process	TL	KCr	C	S
3.1	Console	Process	7	50		
XP	Console XP	Process	8	50		
	Conversational	Process	9	100		
XS	Expert System	Process	10	200		
SA	Self Aware	Process	14	300		
S0	Semi-Organic	Brain-0	10	100	1	1
S1	Semi-Organic	Brain-1	11	400	1D	1D
S2	Semi-Organic	Brain-2	12	800	2D	2D
S3	Semi-Organic	Brain-3	14	1200	3D	3D
P0	Positronic	Brain-0	11	400	1	1D
P1	Positronic	Brain-1	12	900	1D	1D
P2	Positronic	Brain-2	13	1500	2D	2D
P3	Positronic	Brain-3	15	2000	2D	3D
AI-16	Artificial Intelligence	Process	16	2000	1D	1D
AI-18	Artificial Intelligence	Process	18	3000	2D	2D
AI-20	Artificial Intelligence	Process	20	4000	2D	3D
AI-22	Artificial Intelligence	Process	22	5000	3D	3D

Each computer (Local or Master) requires a System Process. It must be installed in the computer is controls. It occupies one Cell.

COMPONENT AND SERVICE PROCESSES

Process	Type	TL	Cells	KCr	C	S
Drive	Component	=Jump	1	=TL		
Power Plant	Component	=PPlant	1	=TL		
Sensor	Component	=Sensor	1	=TL		
Weapon	Component	=Weapon	1	=TL		
Defense	Component	=Defense	1	=TL		
Guidance	Component		1	10		
Life Support	Service		1	10		
Data Base	Service		1	10		
Accounting	Service		1	10		
Astrogation	Service		1	10		
Medical	Service		1	10	+2D	+1D
Entertainment	Service		1	10		
Library Data	Service		1	10		
Security	Service		1	10		
Maintenance	Service		1	10		
Damage Control	Service		1	10	+1D	+1D

Component Processes must be installed in the Computer which controls the Component. The System Process is the controlling software for the computer.

Distributed Processing. Service Processes may be installed in any available Cell in any computer.

COMPUTER MAPS

The interior of a computer can be mapped. It shows the Computer's Cells on a grid based on the computer Architecture.

Architecture-N. Architecture is the number of connections between cells. Architecture-4 connects a cell to 4 adjacent cells; Architecture-9 indicates connections to 9 adjacent cells.

Architecture-3 is triangles; Architecture-4 is squares; Architecture-6 is hexagons.

Many possible architectures exist: for example, Architecture-9 wrapped to a cylinder; Architecture-5 mapped to a sphere.

Standard Imperial Computer Architecture is a compact bounded flat plane with a square grid (Architecture-4).

Applets

Applets are mobile programs roaming about within computers.

UNDERSTANDING APPLETS

An Applet is a mobile program or function capable of moving through the circuitry of computers (as opposed to Processes, which are programs fixed in one location).

Most Applets are basic personalities with low intelligence and simple missions. A Recorded Personality becomes an Applet with the addition of Priority and Expiration.

THE ELEMENTS OF THE APPLET

Char	Details
C4	Intelligence
C5	Education or Training or Instinct
C6	Social Standing or Charisma (but not Caste)
CS	Sanity
	A limited set of Skills or Knowledges or Talents
	A set of unique Memories
	A sense of Purpose and of Self (including IFFN).
	Special Features: Priority. Expiration

Characteristics. An Applet may have one or more characteristics C4 C5 C6.

Sanity. An Applet malfunctions if it fails a Sanity Check.

Skills. An Applet may have one or more skills; usually a specialized Applet skill.

Memories. An Applet has Memories and is able to interact with other applets about them.

Purpose. An Applet has a sense of Purpose, usually hardwired, associated with its activities. The Applet has a sense of Self, including an ability to identify and be identified as a friend or foe.

Priority. Priority is established when the Applet is created.

Expiration. An Applet has an Expiration and it dissolves when this date is reached.

MOVING IN THE CYBERSPACE EVIRONMENT

Applets function within Cyberspace: inside the circuitry of computers. They move along connections between cells.

An Applet may move without limit through empty cells.

It may move without limit through any Process or Applet with a lower Priority. It must Stop when it moves next to a higher priority Process or Applet.

APPLET TYPES

Type	Description
Cleaner	Clears obsolete or useless code.
Fixer	Repairs chance variations or faults.
Phage	Destroys malware.
Courier	Carries internal messages and data..
Popup	Carries messages to outputs.
Censor	Evaluates all Applets passing through it.
AI	Artificially Intelligent personality.
RP	Recorded organic personality.
Virus	Creates applets from within a Process.

APPLET CONFLICT

When applets clash, they resolve it through comparison of assets. The applet with the greater assets prevails (tied applets are immobilized). A losing applet is destroyed.

Applet1 Assets	vs	Applet2 Assets
C4+C5+C6+ Priority + Skills	**vs**	**C4+C5+C6+ Priority + Skills**

If AI or Personality: Add Good Flux.

IFF Identification Friend or Foe or Neutral. Native applets (created within a computer carry an IFF code which identifies them. Defenders attack Applets without the proper IFF code.

APPLET GENERATOR

	1	2	3	4	5	6	Virus
C4	1D	2D	0	0	0	0	A Virus is a
C5	Edu=1D	Edu= 2D	Tra= 1D	Tra= 2D	Ins=1D	Ins= 2D	
C6	Cha= 1D	Cha=2D	0	0	0	0	Data Stream or Message
CS	2D	2D	1D	1D	1D	1D	
Skill (=1D)	Clean	Fix	Anti-ware	Destination	Output	Censor	
Memories	Temporary	Temporary	Temporary	Temporary	None	None	

---------- Priority= 1D Days. Expiration= 1D Days. ----------

SPECIAL APPLETS

	AI	RP
C4	= 2D	= 2D
C5	=2D	= 2D
C6	Cha= 1D	=2D
CS	2D	2D
Skills	Many	Many
Memories	Permanent	Permanent
Priority	=1D	=1D
Expires	= 1D Days	1D Days

Or as dictated by the Sophont details

STANDARD APPLET SKILLS

Skill	Applet Type
Clean=	Phage
Fix=	Fixer
Anti-ware=	Defender
Destination=	Courier
Output =	Popup
Censor=	Propaganda

Personalities

Every sophont (natural or artificial) has a Personality: a unique set of non-corporeal elements that define and empower him independent of his body.

I
For
T5

Through much of history, the personality has been integral with the body and never independent of it. Technology has made it possible to free the personality from the body.

Personalities can be recorded, edited, enhanced, and implanted in new bodies.

The basic technology that allows the recording of personalities in turn allows a wide variety of personality manipulations. Recorded personalities can be overlaid on others for a variety of purposes including mindwipes, life insurance, temporary skills, and recreational personalities.

THE ELEMENTS OF THE PERSONALITY

Char	Details
C4	Intelligence
C5	Education or Training or Instinct
C6	Social Standing or Charisma or Caste
CS	Sanity
	A set of Skills or Knowledges or Talents
	A set of unique Memories
	A sense of self (one's identity).
Added When A Personality Becomes An Applet:	
	IFFN Tags. Priority = 1D. Expiration = 1D.

IDENTIFYING THE ISOLATED PERSONALITY

			C4	C5	C6
X	**X**	**X**	**5**	**6**	**0**

Not Applicable

Manufacturing standards and brand reputation are important for skill wafers. QREBS applies.

Skill Wafer. A skill wafer contains a single skill (it's a personality edited down to a single skill). Overlaid on a subject, it grants him the ability to use that skill.

Recreational Wafer. A recreational wafer contains an interesting personality (primarily its memories). The user experiences those memories, and in the process makes them his own, even after the originals fade.

Occupation Wafer. Temporary local needs can be filled by standardized Occupation Wafers: they overlay the skills required for an occupation (as well as some characteristics and a "loyal" identity). The Sanity risk is considered slight when balanced against the needs of society. Typical occupations include Enforcer, Emergency Doctor, Militia, Damage Control Expert. A person under an Occupation wafer is referred to as: "He's been Programmed Police," or "He's Programmed EMT."

TYPICAL WAFER

The typical wafer is about Size= 1; easily inserted into the Wafer Slot present on most computers.

Wafer Jacks. Some individuals have Wafer Jacks: a small implanted sensor capable of reading a Wafer held near it (there is no slot or break in the skin).

WAFER TECHNOLOGY

Wafer Technology encompasses recording, editing, and implanting personalities. Standard Wafer Technology is available at TL-13.

Recording. Most medical facilities have the ability to record personalities. The process is non-invasive and painless.

More sophisticated systems can record personalities from dead (recently dead) brains.

Editing. A Personality can be edited to **remove** or reduce any of its elements. Elements from other Personalities can be **added** (spliced) into a Personality.

Applet Conversion. The raw Personality Recording is relatively useless. After conversion to an Applet, the Personality can be used overlaid or implanted on subjects.

Overlay. A Personality can be overlaid on a person; the elements of the Recorded Personality which are present suppress corresponding current elements. All other original elements remain.

Overlay is not without its dangers: Check San every Day.

An Overlay is **temporary**; it fades after the Expiration period in Days (usually upon awakening the next morning).

Implant. A person's own Personality can be permanently implanted. If edited, the elements of the Recorded Personality which are present suppress corresponding current elements. All other original elements remain.

Jacked In. A Personality (as an Applet) can be inserted into a Computer. A person can establish a feedback loop with his Recorded Personality within a Computer and monitor its activities. The resulting effect is that the person feels like he is in the computer (the term is **jacked in**).

When the person disconnects, the Personality continues in the computer until it expires.

SOME RESTRICTIONS

Wafer Technology has a variety of restrictions.

Genetic Profile. Personalities are best overlaid on an individual of the same Genetic Profile. If overlaid on a different Genetic Profile, Check San daily for each Genetic Profile difference.

Element=0. If an Element is edited to Zero, it suppresses the current non-zero Element. This technique is the basis for Mindwipe.

Element Removed. If an Element is removed; the current Element remains in force.

Psionics

Hidden behind the known mental characteristics C4 and C5 are the incredible and often untapped powers called Psionics.

Every character has an obscure and usually unreferenced characteristic called Psionics (abbreviated Psi or CP). The characteristic remains obscure until (or unless) the individual is made aware of it through an awakening event. Characters do not generate Psionics until it is first called for by the situation or the referee.

UNDERSTANDING PSIONICS

Psionics is the ability to interact --through the powers of the mind, and independent of physical bodily activity-- with the environment.

Basic Terms: An individual using a psionic ability is an **Operator** or a **Psionic.** If he is interacting with a physical thing or device, it is an **Object**. If he is interacting with a living being (an animal or a sophont), it is a **Subject**. Unless the distinction is important, the term Object includes Subject and Operator.

The capability of an Operator to use Psionics is a Psionic Ability or simply **Ability**.

Psionics Is Obscure

Most people doubt the existence of Psionics, dismiss it as quack science, and generally look down on those who do believe in it.

Culturally Inappropriate. Most cultures in the universe reject Psionics (because of its potential for abuse; because it is poorly documented; and because its scientific foundations are suspect).

Forbidden Knowledge. Psionics is a field of knowledge that is not discussed in polite society. Raising the subject to ordinary citizens can lead to social rejection, cultural ostracism, and legal harassment.

Confusion About Psionics

Psionics is often confused with the otherwise ordinary or normal abilities of various sophonts. Blind sophonts do not understand vision and call humans Psionic because they can sense things by sight. Various talents and senses with sound physical as sound physical basis are labeled Psionic by the ignorant or uneducated.

THE THREE BRANCHES OF PSIONICS

	The Ability To
ESP **Extra Sensory Perception**	Acquire sensory data directly to the mind.
ECM **Extra Corporeal Manipulation**	Manipulate without the use of the body.
Intuitions **Insight, Curiosity, and Luck**	Access useful information before it is needed.

Extra Sensory Perception (Sensing). Psionics allows the acquisition of information from the environment (the same function that the senses fulfill) without the direct use of the physical senses. Each of the senses has a Psionic analog: a Psionic may be able to see at a distance (Clairvoyance), or hear at a distance (Clairaudience).

Extra Corporeal Manipulation (Manipulation). Psionics allows the manipulation of the environment (the same function that manipulators fulfill) without using the body, hands, arms, or manipulators. The basic physical actions have Psionic analogs: a Psionic may be able to move objects without touching them (Telekinesis) or transport them from one place to another (Teleportation).

The Intuitions. Psionics allows the acquisition of limited knowledge not available by any other means, including partial knowledge of events before they occur. Because the future is not immutable, the Intuitions provide an inexact understanding of possible future events.

THE AWAKENING

Psionics is the capability to use Psionic Abilities (which are similar to skills, knowledges, and talents). It is an obscure characteristic which remains unknown to the character until it is awakened by a suitable experience or mentor.
A character's first realization that he may have some psionic ability is called an **Awakening**.

In one of the extreme moments of life (when confronted by great danger; when confronted with few or no apparent alternatives) a character undergoes a **Crisis**. The referee makes the decision to impose an Awakening:

The Sanity Check. The character Checks Sanity (which, by secret direction of the referee, fails). The character is overwhelmed by a sense of calm and great power. At that instant, the Referee secretly creates the character's CP (= 2D +3 - Life Stage) and uses it as a powerful favorable Mod for the remainder of the Crisis. Record this value for the character.

After the Crisis, the Referee says to the character (as a voice in his head):

"I think I might be Psionic."

The Search For Truth. The character now has a choice: to pursue a personal quest to find out more about Psionics, or to ignore the insight.

The Immediately Available Information. Data banks and references provide the following general information.

- Psionics is illegal. It infringes on individual liberties.
- Psionics is quackery; it has no basis in science.
- Small ads (popups, printed pages, spam) promote various "Sciences of the Mind" and potential for "self-development."
- Supposedly, every major population center has a Psionics Institute devoted to Psionics training.

Psionics Institute. Any organization dedicated to research and training in the psionic sciences. Institutes have existed since before star flight, although usually with limited success. At some point in the development of every society, students of the mind sciences make the requisite breakthroughs and develop a scientific basis for their studies.

Psionics Insttitutes are dedicated to refining the psionic sciences and disseminating that information to those who can use it.

THE VARIOUS PSIONICS INSTITUTES

Every High Population world has a Psionics Institute dedicated to some aspect of the sciences of the mind. The key is the high population of the world: providing enough potential recruits to sustain the organization. Psionics Institutes on worlds with Pop less than 9 are usually frauds.

A Psionics Institute May Be Open Or Cloaked

Open Institutes. On worlds which embrace or tolerate Psionics, the Institutes which teach Psionics are Open. They have offices and classrooms accessible to most people, often advertise in the local media, and are listed in local directories.

Cloaked Institutes. Because Psionics is illegal and considered immoral in the Imperium, Psionics Institutes on High Population worlds within the Imperial borders are Cloaked. They are hidden from public attention and attract students through word of mouth or through veiled invitations.

False Institutes. On many worlds, a false institute is interposed between the public and the true Psionics Institute. The false institute provides harmless meditation training (at high cost and dubious effectiveness). Promising candidates are carefully evaluated and may be invited to attend the true institute.

THE PSIONICS INSTITUTE

Flux	Institute Name
- 5	<World> Institute of Psionics
- 4	<City> Institute of Psionics
- 3	<PatronName> Institute of Psionics
- 2	Room 28, Psych Department, <World> University
- 1	<World> Industrial Training Center
0	<World> Psionic Institute
+1	<Name> Retreat for Personal Development
+2	Imperial Society of Magicians and Wonderworkers
+3	Society for the Development of Psionics
+4	Zhodani Cultural Exchange Institute
+5	The Gimalarash Institute

THE TRUE INSTITUTE

A True Psionics Institute provides psionics testing, training, and mentoring.

CP= Psi

Every character has an obscure and usually unreferenced characteristic called Psionics (abbreviated Psi). Characters do not generate Psionics until it is first called for by the referee and the situation.

Psionics is the capability to use Psionic Abilities.

Universal Structure. All sophonts generate Psionics with 2D +3 - Life Stage. A character tested in infancy for Psi rolls 2D +3. Characters are more likely to be tested in adulthood: a human character at age 18 (Life Stage 3) rolls 2D +3 -3.

Recording Psionics. Psionics is not normally indicated in references to a character. When necessary, it is stated independently as CP=N or Psi=N. The value should be stated in Ehex.

Psionics Is Genetic. Record the first Die of Psi as the genetic D.

Psionics Testing.

A Psionics Institute provides high quality testing and evaluation of an individual for Psionics Ability.

Preliminaries. The Psi Test involves detailed brainscanning and further evaluation (including under stress) of the individual. The Test takes a full day.

A Psi Test costs Cr1,000. For suitable or indigent candidates, the cost is waived.

The Psi Test. The Psi Test generates the individual's Psi.

If Psi has already been generated (in an Awakening), that value is used. Reduce it by -1 for each full four years since it was generated.

If Psi has not been previously generated, create it with 2D +3 - Life Stage.

Psionics Is Genetic. Record the first Die of Psi as the genetic D.

Psionics Potential. Any character with Psi=7 or greater is evaluated by an Institute as having potential, and they recommend that he should be trained. Anyone can proceed, however, regardless of recommendation.

Psionic Abilities Are Acquired. Once a character has been tested for Psi and received initial training, he begins his life-long quest to acquire (learn, discover) a variety of Psionic Abilities.

PSIONICS EDUCATION AND TRAINING

Psionics Institutes provide Education or Training for characters with potential. The process consists of a series of training sessions which investigate the character's psionic abilities.

Psionics, however, has an element of philosophy enmeshed in its teachings. To encourage an understanding of the universe, any specific Psionics Institute will only provide one Training Session. Once that session is complete, the character must (in his travels) find another Psionics Institute for his next Training Session.

The Five Stages Of Psionics

The Five Stages of Psionics

The adherents of Psionics progress in their understandings of the science through five distinct **stages**, each with its own meaning and importance.

Those who understand Psionics understand a simple question which also serves as a secret recognition code:

What Stage Are You? Huh?

The person clearly has no clue what this question means. The conversation progresses to other subjects.

What Stage Are You? Second Stage? And you?

The conversation has begun; each has tentatively revealed an interest in, and an understand of, Psionics.

THE FIRST STAGE

The character learns his basic aptitude and a simple trick.

A character attending his first training session determines explores his psionic strength and determines if it is balanced, or if it is concentrated in one of the Basic Abilities.

Every Psionic has (or may have) three Basic Abilities: Direct, Self, and Remote. These abilities control the circumstances and results of psionic activity.

The first training decision is whether to remain equal in all three, or if he should concentrate his powers in one or two areas. The decision will last a lifetime.

Basic Ability Allocation. The character has **three times** Psi in points available to allocate to Direct, Self, and Remote, but no Basic may be allocated less than Half CP in points. It is possible to allocate zero points to an Ability.

Direct requires physical contact between the operator and the subject. Psionic tasks assume Direct. Direct is limited to R= 0 Contact.

Remote operates at a distance from the operator and without physical contact. Remote Psionic tasks add a Remote component (and cost). Remote is limited to R= CP.

Self reflects the power of Psionics onto the individual himself. Self Psionic tasks are distinct from Remote or Direct.

At the end of the First Training session, the character also learns a fundamental psionic arcane ability (some call it a trick):

To cloud other minds
Check Psi (2D)

Success forces others to completely ignore the character (and those around him as part of his group). The effect does not affect security sensors, imagers, or technological devices. Most new Psionics try out their new ability as soon as possible.

Finally, the character is formally declared a **First Stage Psion.**

THE SECOND TRAINING SESSION

The character learns his aptitude for ESP.

A character attending his second training session determines explores his ESP Extra Sensory Perception abilities. There are six Psionic Senses corresponding to the six natural senses.

Sensing Mirrors The Known Senses

Sensing operates in very same way as the known senses: Vision, Hearing, Touch, Smell, Awareness, and Perception. The distinction is that an Operator need not have the corresponding physical sense in order to have a Psionic Ability. The use of the Psionic Senses allocates CP and Abilities into the Sense Action requirements for Constant. Other applicable Mods are imposed and the Action is resolved. Use of the Psi-Senses is Remote; Range is counted from the operator.

Basic Ability Allocation

The character has **three times** Psi in points available to allocate to the six Psionic Senses, but no Psionic Sense may be allocated less than Half CP in points. It is possible to allocate zero points to an Ability.

The points allocated to the Psionic Sense become the Sense Constant. Psi- Touch and Psi- Smell actions (normally required to be in contact and using 2D) are instead resolved with dice equal to Range. If Psi-Vision is selected, any three adjacent wavelengths may be selected.

The Psionic Senses operate without regard to barriers and obstructions. Objects larger or smaller than Benchmarks produce Mods equal to the difference in Size.

At the end of the Second Training session, the character has learned the basics of ESP. He is also instructed in the dangers of fatigue when using ESP: after every Psi-Sense action, there is a chance of overwhelming fatigue: Check Endurance; failure advances Attention Level (see The Personal Day) one lower.

At the end of the session, the character is declared a **Second Stage Psion**.

For example, Human Citizen Uvasti Seng 666B99 Psi-5 has found a new Psionics Institute for his Second Training Session. He has (Psi-5 x 6 =) 30 points to allocate among the Psionic Senses. He decides to concentrate and allocates all 30 points to Psi-Vision.

After the session, in his ship, he stands in the cargo hatch and experiments. About a kilometer away (Range = 5) there is a person on an access road under some lights. He looks out into the distance (he isn't looking for the person; the action determines if he Spots or notices it). His Vision Action is V- 16-RGB. He must roll 16 or less on 5D (about a 40% chance of noticing it). He rolls 16 and he Spots the person.

To **Spot** an Object
Range < Vision + Benchmark + Adjust + Comment
5D < 16

Now he turns and scans the darkness across the tarmac. He cannot See a thing. He turns his attention to his Psi- Vision. There is a Size-5 Attack Beasts almost at the horizon Range= 6.

To **Spot** an Object Psi-Vision
Range < Psi-Vision + Benchmark + Remote + Mod
5D < 30 - 1

He must roll 29 or less on 5D (which is almost automatic). He is amazed at how clearly he can see in the dark. Then (Check End [not C5]) he is overcome by a feeling of fatigue; he closes the cargo hatch and retires for the night.

THE THIRD TRAINING SESSION

The character explores his aptitudes for ECM.

A character attending his third training session determines explores his ECM Extra Corporeal Manipulation abilities.

Extra Corporeal Manipulation uses psionic ability to move or change matter or energy in the environment. In a very general way, Manipulation represents active (rather than passive) Psionics.

Manipulation may be Remote or Direct.

There are six Psionic ECM Abilities: Move, Teleport, EShift, The Touch, OOB, and Mentation.

Basic Ability Allocation

The character has **three times** Psi in points available to allocate to the six Psionic ECM Abilities, but no Ability may be allocated less than Half CP in points. It is possible to allocate zero points to an Ability.

The points allocated to the ECM Ability become the Constant in the use of the Ability.

At the end of the training session, the character is formally declared a **Third Stage Psion**.

Move

Move is the Ability to change an object's physical location.

To Move an Object
Range (nD) < Constant + Remote – Size
Range (nD) < Constant + Direct - Size

Move is a physical location change (Psychokenesis if the operator is touching the object; Telekinesis if the operator is remote) rather than Teleport. If an operator performs Move on himself, it is Levitation. It is possible for an operator to Move an object which standing or riding it.

Move can impart a Speed to an object. Minimal speed and location change is easy and automatic. The maximum speed that can be imparted is Move Constant divided by 10 (retain fractions).

Gravity is not involved in the Move process.

Teleport

Teleport is the Ability to move objects (including the Operator himself) instantaneously to a distant point.

Teleport is instantaneous.

Teleport Distance. Teleport requires that the operator visualize (or sense) the destination. A Psion can Teleport to a location he can see (or use another of his senses to sense). excluding As a practical matter, possible Teleport distance is the limit of ordinary vision (R=8 = 500 km).

Teleport ignores all intervening obstacles: it passes through walls, matter, energy differences, all barriers.

Temperature Change. An object or a person who changes altitude is subject to a temperature change effect: Altitude Change R = Range. If the subject increases altitude, the subject sustains Cold- R. If the subject decreases altitude, the subject sustains Heat-R.

To Teleport
Range (nD) < Constant + Remote - Size
Range (nD) < Constant + Direct – Size

Teleport using Direct requires the operator physically touch the object being teleported.

Explorer Bin Lagash (CP=9, Teleport-8, Size=5) is surveying a world far beyond the Imperial frontier. Surprised by a snowcat (Size=3, Range=1), he reacts instinctively as it leaps and tries to teleport the snowcat one kilometer straight up (=Range 5). He needs to roll 17 - 1 - (3 + 1) - 5 = 7. He rolls 6 and succeeds. The Snowcat inexplicably finds itself 1000 meters up, immediately suffers Cold-5, and is falling.

Bin likes the dramatic; a better-trained user would simply teleport the Snowcat 50 meters away Range=2, leaving the animal unharmed. He would need to roll 17 - 1 - (3 + 1) - 2 = 10, giving a substantially better chance of success.

Stutterport. It is possible for an operator to continuously teleport an object over a series of very small distances.

To Stutterport
Range (nD) < Constant + Direct - Size
Each action takes 1/C3 seconds (Endurance-7 allows seven actions per second.

Rogue Ank Lagash 777B77 (CP=9, Direct-9, Teleport-9) climbs aboard a slab of rock (Size=6) and concentrates. He needs to roll (9 + 9 – 6) = 12 on 2D which is automatic. The slab moves about 50 meters instantaneously; he keeps concentrating, and the slab moves another 50 meters in the same direction. Ank could keep this up all day long (he thinks), but after perhaps 21 of this short teleports (Check End each time), he feels a wave of fatigue and grounds the slab. He has moved about (21 teleports of 50 meters each) = 1,050 meters; each teleport controlling thought took about a seventh of a second: the slab had an effective speed of (21 teleports / 7) = 3 seconds; (1,050 meters / 3 seconds) = 350 meters per second.

Eshift or Energy Shift

Energy Shift is the Ability to channel energy from the environment into or out of object: Energy Transfer is the equivalent of a heat pump.

To Shift Energy In
To Shift Energy Out
Range (nD) < Constant + Remote - Size
In Contact (2D) < Constant + Direct - Size
Self (2D) < Constant + Self - Size

Success in Eshift allows the operator to impose Hot-N, Cold-N, or Elec-N where N is the Eshift Constant (N = actual points transferred, not Dice).

Energy Shift can be used in both positive and negative ways. It can inflict damage on objects, or it can counteract or cancel damage inflicted on objects.

Characteristic Shift. Eshift can also transfer or enhance Characteristics.

To Transfer a Characteristic
Range (nD) < Constant + Remote – Value
Contact (2D) < Constant + Direct – Value

Transfer may be <u>out</u> (from the operator to the subject) or <u>in</u> (from the subject to the operator). The transferred value remains with the recipient for about an hour and then wears off one point per minute. The donor's characteristic is similarly reduced.

The Touch

The Touch is the Ability to influence biological processes. It may be a positive or a negative activity. The Touch is Direct or Self.

The Healing Touch
The Hurting Touch
Direct (2D) < Constant + Direct – Size – Hits
Self (2D) < Constant + Self – Size - Hits

The operator lays his hands (manipulators) on the subject and removes (or inflicts) hits (damage). Hits are expressed in points (not Dice). If the action is Self, the operator is healing his own wounds.

OOB

Out Of The Body is the Ability to project one's consciousness to a location apart from the body and without regard to barriers. The individual is equipped with his own senses and his psionic senses in the remote location.

To Travel OOB
Range (nD) < Constant + Self
The consciousness (indeed, the personality) of the operator leaves the body to travel to the remote location; the body remains unconscious for the duration of the activity. Travel time to the location is about one minute per Range Band. The operator may remain OOB as long as he desires, but when the operator becomes Tired, the consciousness is drawn back to the body.

An operator in OOB can observe with the physical senses as well as the Psionic Senses. He cannot interact with physical objects except through Psionic abilities.

MENTATION

Mentation is the Ability to read, influence, and control minds. The process is one of domination: those with greater Psi are able to influence those with lesser (or with no) Psi.

To win a Psionic brawl.
Difficult (3D) < Psi + Remote - PsiShield
Opposed (up to 4). Resolves the brawl in one task. All losers receive 2D hits. The winner is unscathed.

To Control A Mind
Difficult (3D) < Psi + Remote - PsiShield
Difficult (3D) < Psi + Direct
Opposed (2). Resolves in one task.
The Loser is obeys the winner for 1D Rounds.

To Read A Mind
Difficult (3D) < Psi + Remote - PsiShield
Difficult (3D) < Psi + Direct +Mod
Opposed (2). Resolves in one task.
The winner obtains the information from the mind of the loser.

Armor. PsiShield is a defense against the Remote psionic efforts; it does not restrict defenses.

THE FOURTH TRAINING SESSION

The character explores his abilities in Ethics.

A character attending his fourth training session finds that the focus has shifted. He already has a potentially wide array of abilities and has had the opportunity to use them in everyday life. The Fourth Session teaches no abilities; it instead deeply examines the personality of the individual and its disposition toward Ethics.

The Test

The character undergoes a simple but formal test under the supervision of a committee of advanced Psions. Their examination probes into the depths of the character's mind and personality and evaluates it.

Roll Flux for a value between +5 Good and – 5 Evil.
Roll Flux for a value between +5 Order and – 5 Chaotic.
In each case, 0= Neutral.

The committee (the Referee) then discusses these results with the character (the Player). Through a process of negotiation, they adjust the results to values which the character accepts as ideal.

The process is entirely non-judgmental: no specific results are encouraged or discouraged.

At the end of the session, the character is formally declared a **Fourth Stage Psion.**

FINDING A FIFTH STAGE INSTITUTE

A Fourth Stage Psion or higher must find an institute which is in tune with his personality. When the character finds and approaches an Institute, roll Flux twice to produce values for Good/Evil and Order/Chaos. An institute which does not coincide with the character's general values will be (sadly) turned away.

The Types Of Institutes

Order / Good	Neutral / Good	Chaotic/ Good
Order/ Neutral	Neutral / Neutral	Chaotic/ Neutral
Order/ Evil	Neutral/ Evil	Chaotic/ Evil

For example, Fourth Stage Psion Ank Lagash Tested -3 Chaotic +2 Good and after some negotiation with the Committee, he accepted a rating of -3 Chaotic +3 Good. While visiting a world, he locates a Psionic Institute (which the Referee determines is Order Good (the specific values don't matter).

They turn him away as unsuited for their disciplines.

THE FIFTH TRAINING SESSION

The character explores his abilities in the Intuitions.

A character attending his fifth training session discovers the details of the Intuitions and his abilities with them.

The Intuitions

There are three Intuitions: Insight, Luck, and Curiosity.

Curiosity relates to the serendipitous acquisition of information.

I**nsight** relates to the processing of information.

Luck relates to forcing favorable outcomes.

Basic Intuition Allocation

The character has **two times** Psi in points available to allocate to the three Intuitions, but no Intuition may be allocated less than Half CP in points. It is possible to allocate zero points to an Intuition.

At the end of the training session, the character is formally declared a **Fifth Stage Psion**.

Using The Intuitions

The Intuitions are values to be Checked.

Only One At A Time. In each gaming session, randomly select one of the three Intuitions (even if the character has that Intuition at zero-value). The Intuitions are available one-at-a-time. Once one has expressed itself, it becomes dormant until both of the others have expressed themselves as well.

Check Insight. The character can see (or puzzle out) correct action, which usually expresses itself as a question: "Why don't we try (blank)?"

Roll 2D. If the result is equal or less than **Insight**, the proper course of action reveals itself to the character.

Check Curiosity. The character wonders about the nature of objects or the environment, which usually expresses itself as a question: "Why is that (blank)?"

Roll 2D. If the result is equal or less than **Curiosity**, the nature of the object becomes apparent.

Check Luck. The character is naturally lucky. When a negative event occurs, he has a chance that it will miss him. "Just lucky I guess." Luck applies to its holder: it cannot be shared or transferred to others.

Roll 2D. If the result is equal or less than **Luck**, the negative event does not happen.

THE SIXTH STAGE

The Sixth Stage represents the beginning of self-instruction and self-improvement….

PSIONICS IS AN ORGANIC ABILITY

Non-organic (electronic, fluidic, photonic, positronic) brains are incapable of psionics.

On the other hand, a semi-organic brain with psionic ability is capable of psionics and may even be enhanced by its nonorganic computing power.

Organic personalities with psionic ability retain that ability but cannot use it while in purely electronic form. If overlaid or implanted on an organic or semi-organic brain, the psionic abilities of the personality become usable again.

TRADITIONAL PSIONIC ACTIVITY EQUIVALENCES

Traditional	Psionic
Astral Projection	OOB
Clairalience	Psi-Smell
Clairaudience	Psi-Hearing
Clairgustance	Psi-Smell (the Taste aspects)
Clairsentience	Psi-Touch
Clairvoyance	Psi-Vision
Cryokinesis	Eshift
Electrokinesis	Eshift
Healing	The Touch
Levitation	Move
Mind-Reading	Mentation
Out of the Body	OOB
Psychokinesis	Move
Pyrokinesis	Eshift
Remote	Viewing Psi-Vision
Telekinesis	Move
Telepathy	Mentation
Teleportation	Teleport

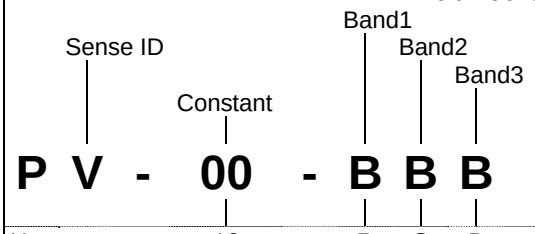
The traditional names for paranormal activity have their equivalents in Psionics, as shown in this table.

The Psionic Senses

The Psionic Sense Actions correspond to the physical senses.

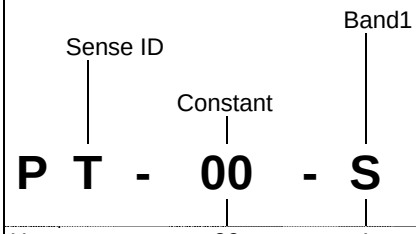
Psi-Senses

V =VISION — Human Vision Constant **16**



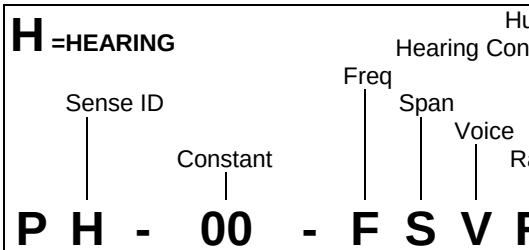
nD To Notice an Object
< Constant + Benchmark + Remote + Mod

T =TOUCH — Human Touch Constant **06**



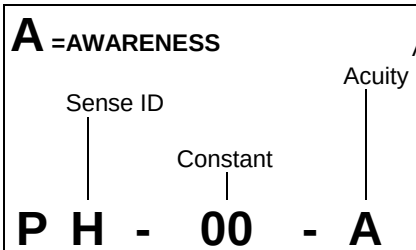
nD To Notice a Texture
< Constant + Benchmark + Remote + Mod

H =HEARING — Human Hearing Constant **16**



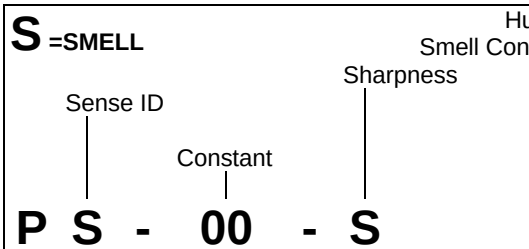
nD To Notice a Sound
< Constant + Benchmark + Remote + Mod

A =AWARENESS — Human Aware Constant **X**



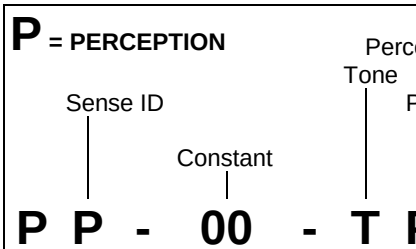
nD To Notice a Field
< Constant + Benchmark + Remote + Mod

S =SMELL — Human Smell Constant **10**



nD To Notice a Scent
< Constant + Benchmark + Remote + Mod

P = PERCEPTION — Human Perception Constant **X**



nD To Notice an Aura
< Constant + Benchmark + Remote + Mod

RANGES

Range=	0	1	2	3	4	5	6	7	8	9
Range	Contact	Vshort	Short	Medium	Long	Vlong	Distant	VDistant	Orbit	Far Orbit
Distance		5 m	50 m	150 m	500 m	1000 m	5000 m	50 km	500 km	5000 km

The Stages of Psionics

Psionic personal development progresses through five Stages, perhaps six Stages.

Psionics Stages

1 THE FIRST STAGE- BASIC ACTIVITIES

Allocate:	To	
	Direct	May be Zero. If Not Zero, Minimum -= Half CP.
3x CP	Self	
	Remote	

Direct requires physical contact between the operator and the subject. Psionic tasks assume Direct.

Remote operates at a distance from the operator and without physical contact. Remote Psionic tasks add a Remote component (and cost).

Self reflects the power of Psionics onto the individual himself. Self Psionic tasks are distinct from Remote or Direct.

2 THE SECOND STAGE- PSI-SENSES

Allocate:	To	
	Psi-Vision	May be Zero. If Not Zero, Minimum -= Half CP.
3x CP	Psi-Hearing	
	Psi-Smell	
	Psi-Touch	
	Psi-Aware	
	Psi-Percept	

The six Psi-Senses are analogs of the six physical senses. Create a String for the resolution each available Psi-Sense.

3 THE THIRD STAGE- ECM

Allocate:	To	
	Move	May be Zero. If Not Zero, Minimum -= Half CP.
3x CP	Teleport	
	Eshift	
	The Touch	
	OOB	
	Mentation	

Move is the Ability to change an object's physical location.

Teleport is the Ability to move objects (including the Operator himself) instantaneously to a distant point.

Energy Shift is the Ability to channel energy from the environment into or out of object: Energy Transfer is the equivalent of a heat pump.

The Touch is the Ability to influence biological processes. It may be a positive or a negative activity.

Out Of The Body is the Ability to project one's consciousness to a location apart from the body and without regard to barriers.

Mentation is the Ability to read minds.

4 THE FOURTH STAGE TEST

	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
-5	Chaotic Evil						Chaotic Good				
-4											
-3											
-2											
-1											
0	Neutral						Neutral				
+1	Orderly Evil						Orderly Good				
+2											
+3											
+4											
+5											

Roll Flux Twice (once on each axis) to determine the preliminary ethical predisposition of the character. These values can be adjusted in the course of negotiations with the committee.

5 THE FIFTH STAGE- INTUITIONS

Allocate:	To	
	Insight	May be Zero. If Not Zero, Minimum -= Half CP.
2x CP	Curiosity	
	Luck	

Curiosity relates to the serendipitous acquisition of information. The character wonders about the nature of objects or the environment, which usually expresses itself as a question: "Why is that (blank)?"

I**nsight** relates to the processing of information. The character can see (or puzzle out) correct action, which usually expresses itself as a question: "Why don't we try (blank)?"

Luck relates to forcing favorable outcomes. The character is naturally lucky. When a negative event occurs, he has a chance that it will miss him. "Just lucky I guess." Luck applies to its holder: it cannot be shared or transferred to others.

6 THE SIXTH STAGE…

The teachings of the Institutes say the Sixth Stage is one of self-directed enlightenment.

Sophonts

The **Traveller** universe is filled with non-human sophonts. Many of these can be created using the **Traveller** Sophont Creation System. The result is a completed Sophont Creation Card: by which a player can generate sophont characters (both player-characters and non-player characters).

Sophont Creation is based on two far-reaching assumptions:

Intelligent Non-Humans. This system generates sophonts: intelligent races who exist in roughly the same planetary environments as humans. They breathe atmospheric gases (or water) normally found on human-inhabited worlds and they can live in roughly the same environments.

In Interstellar Society. Sophonts created by this system live within the greater social and economic structure of interstellar society; they compete with everyone else (including humans) for jobs and positions in that society. Members of the created race can pursue careers in the same way that any human character does. Members of the race can be player characters.

THE PURPOSE OF THE SOPHONT CREATION SYSTEM

The purpose of the **Traveller** sophont creation system is to provide a variety of non-human characters to populate the Traveller universe. Explorers visiting a world find it populated with non-humans unlike those on neighboring worlds; merchants trading with a world encounter unique non-humans to deal with; passengers on a starship find a variety of strange and fascinating fellow passengers.

Each use of the Traveller **Sophont Creation System** creates a unique intelligent race for **Traveller**. The results are recorded on a **Sophont Creation Card** (this process does not create a character: it records the information needed to later create one or more characters for this specific race).

The **Traveller Sophont Creation System** is expressed as a dice-driven random process, but it can also be used an a deliberate system, with the use selecting elements from each procedure to achieve specific results.

All of the details of Sophont Creation are allow the creation of characters which use the same rules as apply to humans (more or less) in **Traveller.**

Other Information. This Traveller Sophont Creation Process necessarily refers to other information, rules and charts from **Traveller**. Worlds are more fully created and defined elsewhere. Character generation is more fully detailed elsewhere. While this process strives to be complete, this chapter cannot contain all relevant information, and other chapters may need to be consulted.

WHAT SCS DOES NOT DO

The Traveller Sophont Creations System cannot create all possible sophonts or address all possible situations. Clearly, a referee can imagine and implement an alien lifeform which falls outside the range of sophonts created here.

The TSCS does not create non-physical bodies, fantasy creatures, or beings well outside the environment tolerable to humans, and this list is not exhaustive.

THE WISE MAN'S GUIDE TO SOPHONTS
IISS, Encyclopediapolis, 1107

The preferred guide to the intelligent species of the Imperium is published by the Imperial Interstellar Scout Service as a continually updated database with a hardcopy option. The text includes sophisticated search options and is routinely consulted by naval and civilian crew before contact with an unfamiliar race.

The following are standard concepts for the Imperial Interstellar Scout Service and its classification of sophonts.

Sentient. Endowed with feeling and unstructured consciousness; generally aware and capable of action and reaction, but guided more by instinct and desire than by structured thought or planning. Able to adapt effectively to the environment, either by making a change in oneself or by changing the environment or finding a new one. Sentience is often called animal intelligence. A tiger, a groat, and a gazelle are all sentient. From the Latin for *feeling*.

Sapient. Possessing intelligence: the mental ability to reason, think abstractly, comprehend ideas, and learn. Generally capable of being educated and achieving insights. Sapient and sophont are synonyms, but sapient generally has a lower threshold. The traditional usage: sapients are (still) bound to their original homeworld. Sapients are intelligent. From the Latin for *wise*.

Sophont. Possessing intelligence: the mental ability to reason, think abstractly, comprehend ideas, and learn. Generally capable of being educated and achieving insights. Sapient and sophont are synonyms, but sophont generally covers a broader range. The traditional usage: sophonts have traveled to the stars and have presences on other worlds. Sophonts are intelligent. From the Greek for *wise*.

TERMINOLOGY

The following terms are used.

Species is a biological classification of beings which share the same genetic and biological structures. Dog (*Canis lupis*) is a species. Humanity (*homo sapiens*) is a species.

Race is a sometimes used term for an intelligent species. Humanity is a race. Aslan is a race. Less frequently, race refers to subdivisions within an intelligent species (for non-intelligent species, the equivalent is breed or subspecies (poodle and spaniel are breeds or subspecies within the dog species).

Alien (from the human point of view) is any **non-human** intelligent species. However, because non-humans consider humans aliens, a less point-of-view term is required: we use the term **sophont**.

Sophont is any intelligent species. If the species has never ventured beyond its homeworld, the alternative Sentient is often used.

The Major Races

Interstellar society applies the term Major Race to sophont civilizations which have independently invented/ developed/ discovered jump drive. Because such civilizations also become prominent over large regions, Major Race also refers to the relative power or importance of the species.

The Minor Races. By default, any sophont civilization which is not Major is Minor. Minor races most likely do not venture far from their homeworld; they are typically encountered on their homeworlds, a few neighbor worlds, and in other systems within 10 parsecs of their homeworld.

HOW DO WE IDENTIFY A SOPHONT?

It's easy to create a name for a race of Sophonts (really no more than random words), but the standard reference to any specific Sophont is the LongName: the racial name of the Sophont accompanied by the homeworld name and its homestar and orbital data.

For example,

The Urdushkha of Irdi (Irluush 5 [F4 V])
The Solomani of Terra (Sol 3 [G2 V])
The Aslan of Kusyu (Tyeyo-3 [G4 V])

Non-Natives. Some worlds have a substantial population of non-native sophonts. Where they live as a group on a world, they are referred to as "from" if they are not on their current homeworld.

For example, there is a substantial Terran settlement on a world orbiting Vega: They are referred to as

The Solomani <u>from</u> Terra (Sol 3 [G2 V])

AN OVERVIEW

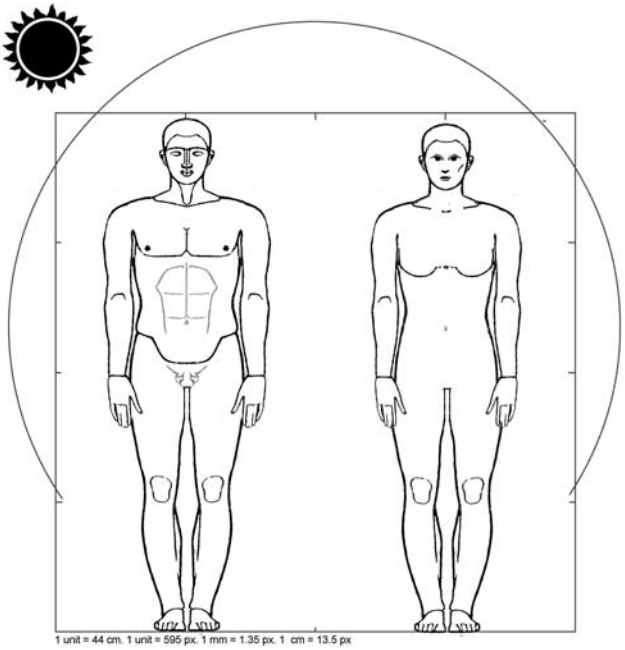
The SCS process proceeds through several pages of charts:

Introduction. This introduction is an overview of the Traveller Sophont Creation Process.

01. The Sophont Creation Checklist recapitulates the steps necessary to create a Sophont race.

02. The Sophont Creation Card records the information needed to generate a **Traveller** character from the created race.

03. The Sophont Creation FillForm is a worksheet for recording and calculating in the details of a Sophont. Ultimately, this information is transferred to the Sophont Creation Card.



The Solomani of Terra (Sol-3 [G2 V])

04. Basics. The process selects or creates a plausible homeworld and determines the environment in which the race evolved.

05. Environment. The process selects the homeworld terrain and environmental conditions in which the sophont evolved.

06. Characteristics. The process determines the six personal characteristics for the race.

07. Caste. If the race has Caste as its social characteristic, then the process determines the details of the racial caste structure. This page is skipped if the race does not have Caste.

08. Gender. The process determines the gender structure of the race.

09. Life Stages and Aging. The process determines the stages of life through which race members pass: from infancy to retirement. This information is used to determine the lifespan and the effects of aging.

10. The Senses. Races may have the same senses as humans, or they may be different. The process determines which senses the race has and how the senses function.

11. Sophont Body Structure. The process determines the basic physical structure (symmetry, number of limb groups, location of the brain case, and location of the senses) of the race. It also determines details of appearance (armor, skin appearance, natural weapons, and body fluids) of the race. These details may or may not be of any use in most play. Many are for background.

12. Special Abilities. Tables determine the presence or absence of special abilities, with availability to the race as a whole, to members of genders, and to members of castes. This page also contains the skill lists for Skill-based Caste.

13. Manipulators. Images illustrate the abilities of the manipulators assigned under Body Structure.

14. Uniques. The process suggests structures for those rare sophonts who have unique or non standard abilities.

15. Size. Formulae calculate the average or expected size for the sophont based on characteristics, and against a standard of Human =100.

16. Example Sophont Description. A sample description for a sophont shows in detail how characters may encounter data entries on a sophont.

17. Example NIL Description. The NIL Native Intelligent life short format for describing sophonts is described.

18. Example Sophonts. A (non-exhaustive) list of sophonts in the Traveller universe is provided.

THE SOPHONT CREATION CARD

Centralized record keeping for Sophont Creation is provided by the Sophont Creation Card. The two-sided card records the details of the Sophont, and serves as the reference tables for creating sophont characters.

The Fillform. The Fillform is a worksheet designed to make Sophont creation a smooth process.

04. HOMEWORLDS

The Homeworlds Page details the creation of the native star system and world for the Sophont.

Pre-Existing Information. If information on the homeworld and homestar is available, it may be used. It should conform in structure to the information generated here.

Plausible Homeworlds. A homeworld is plausible if it has Atmosphere 2 through 9 and a Population of 7+.

Stars

Stars are identified by their Spectral type and Size in the format G2 V, where G is the Spectral Type (taken from OBAFGKM), 2 is the Spectral Decimal (in the sequence 0123456789), and V is the Size (in the sequence Ia-Ib-II-III-IV-V-VI-D).

This creation page ignores multiple stars. If present, they are lesser than the HomeStar and of no real importance in the Sophont Creation process.

Naming and Identifying Stars. A star is typically named and identified. For example,

Sol (G2 V)

Worlds and Orbits

The location of the homeworld in the system is important. Worlds may be planets (orbiting the star) OR satellites (orbiting a planet).

Worlds are identified by their name or by their starname and orbit. Planet orbits are numbered in the sequence 0-1-2-3-4-5-6-7-8-9-10-11-12.

For example,

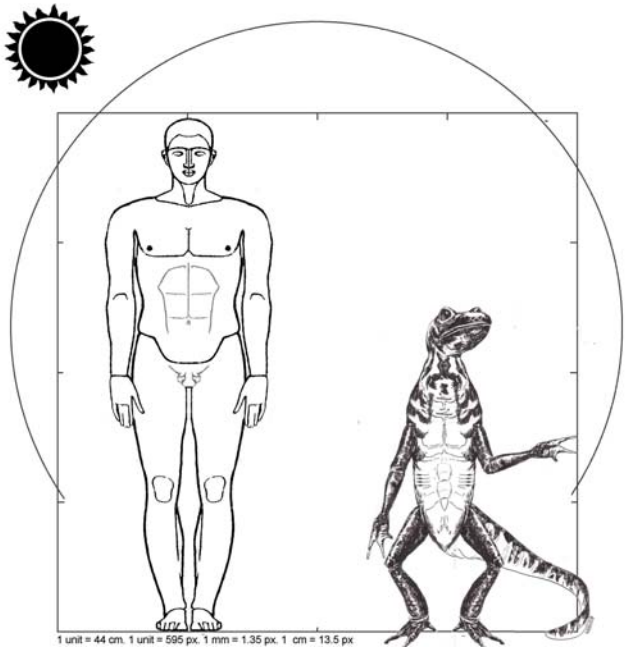
Terra (Sol 3)

Satellites are identified by their name, or by their starname plus the orbit of their planet and the satellite orbit. Satellite orbits are identified by letters in the sequence: Ay-Bee-Cee-Dee-Ee-Eff-Gee-Aitch-Eye-Jay-Kay-Ell-Em-En-Oh-Pee-Que-Arr-Ess-Tee-Yu-Vee-Dub-Ex-Wye-Zee.

For example,

Luna (Sol 3 Em)

The Habitable Zone HZ. The Habitable Zone Orbit Table shows the orbit number for the Habitable Zone, which is the orbital distance at which a typical world experiences temperatures and climate hospitable to humans and similar sophonts.



The Bwaps (Newts) of Maharaban

A world which is in the HZ (noted as HZ=0 or simply HZ) is **Temperate.** It has a range of temperatures, but the world is generally hospitable or habitable.

A world which is one orbit closer to the star (HZ= -1) is **Hot**; circumstances such as albedo and greenhouse effect lessen the heat effects to allow the world to be habitable, although it is at the upper temperature limits of human habitability.

A world which is one orbit farther from the star (HZ= +1) is **Cold**; albedo and greenhouse effects may lessen cold effects to allow the world to be habitable, but it is at the lower temperature limits of human habitability.

A world closer than HZ= -1 is too hot for routine occupation. Such worlds however, in Orbit 0 or 1 have a habitable **Twilight Zone.**

A world farther than HZ= +1 is too cold for routine occupation.

Satellites are classified for habitability based on the orbit their planet or gas giant occupies.

Natives

If a world has Population 7 or higher and Atmosphere 2 through 9, it has a Native population and is suitable for Sophont Creation.

Extinct Natives. If a world has Atmosphere 2 through 9 and Population 0, then a Native Population can be created, but it is Extinct. There may be ruins of the extinct sophonts scattered about the world.

Exotic Natives. If a world has Atmosphere A+ and Population 7+, its Natives are Exotic. They breathe exotic atmospheric gases and require protective suits and breathing gases in human friendly environments.

Special Cases. There is also always the chance that the native population is in decline (less than Pop=7), or undiscovered (probably less than Pop=7) in remote terrain.

Non-Natives

Sophont inhabitants of a world may be non-native, including Transients, Settlers, Colonists, Corporate, and Transplants.

05. NATIVE ENVIRONMENT

The Native Environment page details the evolutionary origins of the Sophonts: the terrain in which they evolved, and the type of locomotion they use, and the ecological niche their forebears occupied.

Native Terrain and Locomotion

The native terrain for the Sophonts provides insights into the origins of the species, and influences the type of locomotion it uses.

Terrain. Eleven general terrain types are specified. If the world has a Twilight Zone, special terrain types are allowed.

Locomotion. The system of movement for the Sophont is detailed, and further influences the physical structure of the Sophont.

Ecological Niche

The ecological niche and subniche shows what position in the food chain the Sophont occupies.

06. CHARACTERISTICS

The Characteristics page details the assignment of the physical, mental, and social characteristics for the Sophont. Separately, the number of dice rolled for each Characteristic is determined.

Humans. Humans have characteristics Strength, Dexterity, Endurance, Intelligence, Education, and Social Standing. 2D is rolled for each characteristic.

Big Sophonts

The extreme upper reaches of the Characteristic Values Table produces Characteristics with values 4D 5D or 6D. Because the lower range of these rolls produces abnormally low values, the first two dice of each roll are automatically 6 each.

For example, for a sophont rolling C1 Str = 4D, the actual roll is 12 + 2D.

07. CASTES

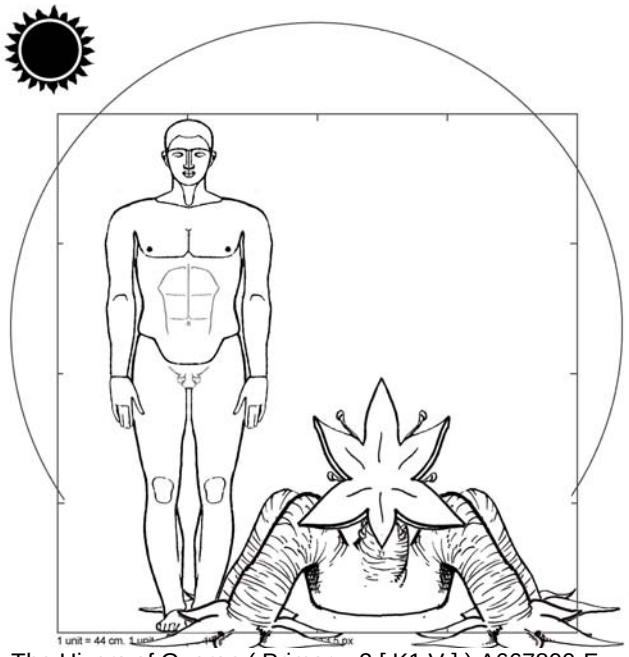
The Castes page details the structure of Castes for the sophont. If Characteristic C6 does not equal Caste, this page is skipped.

The Central Concept. The Caste Creation process creates a Caste Generation Table with entries 02 through 12; when the SCC is used to create individual characters, this table is used when determining individual Caste for a character. For example, in the process of creating four different Sophonts (we'll call them the Ay, Bee, Cee, and Dee), each with Body Caste Structure. For each, the creator rolls Flux for each entry. He will need nine rolls for each Sophont. The (example) rolls are

EXAMPLE ROLLS

	02	03	04	05	06	07	08	09	10	11	12
Ay	0	0	0	0	0	x	0	0	0	0	x
Bee	-5	-4	-3	-2	-1	x	0	+1	+2	+3	x
Cee	+5	+4	+3	+2	+1	x	0	-1	-2	-3	x
Dee	0	+1	-1	+2	-2	x	+3	-3	+4	-4	x

(This is a table of example die rolls to help understand Sophont Caste Creation. Each row is a pregenerated set of Flux rolls used in the example. The first row [Ay] is a constant roll of zero [column 7 does not need a roll]. Row Bee starts at -5 and works its way up; Row Cee works its way down. Row Dee is random.) The rolls create the results below:



The Hivers of Guaran (Primary- 2 [K1 V]) A667800-F

Specimen Caste for the Ay, Bee, Cee, and Dee

F	Entry	Ay	Bee	Cee	Dee
1	K02	Muscle	Healer	Claw	Muscle
2	K03	Muscle	=Gender	=Special	Muscle
3	K04	Muscle	Antibody	Voice	Memory
4	K05	Muscle	Sensor	Muscle	Muscle
5	K06	Muscle	Memory	Muscle	Sensor
6	K07	Muscle*	Muscle*	Muscle*	Muscle*
5	K08	Muscle	Muscle	Muscle	Voice
4	K09	Muscle	Muscle	Memory	Antibody
3	K10	Muscle	Muscle	Sensor	=Special
2	K11	Muscle	Voice	Antibody	=Gender
1	K12	Brain*	Brain*	Brain*	Brain*

F= Frequency: the number of times this entry is expected to occur out of 36 rolls. * Automatic Entry.

These tables are used in Character Generation; a player creating an individual sophont character for the Ay Bee Cee or Dee would use this table to determine the Caste for the character:

Ay caste characters are almost all Muscles. One in 36 is a Brain.

Bee caste characters have a one in 36 chance (entry 02) of being a Healer. They have a dedicated gender member.

Cee caste characters have a one in 36 chance of being a Claw (some sort of warrior) (entry 02). Note that they have Special caste (which is then determined from the Special column).

Dee caste characters have a 12 in 36 (1 in 3) chance of being a Muscle (entries 02, 03, 05, 07). They have both a special and a gender entry.

08. GENDER

The Gender page details the structure of Genders for the sophont. Information about Gender is recorded on the back of the SCC.

The term Gender is used to convey a combination of social, cultural, and reproductive concepts not fully conveyed by the term Sex.

The Central Concept. The Gender Creation process

creates a Gender Generation Table with entries 02 through 12; when the SCC is used to create individual characters, the Gender Generation Table is used when determining individual Gender for a character. For example, in the process of creating four different Sophonts (we'll call them the Ay, Bee, Cee, and Dee), each with Dual Gender Structure. For each, the creator rolls Flux for each entry. He will need nine rolls for each Sophont.

The (example) rolls are

	02	03	04	05	06	07	08	09	10	11	12
Ay	x	x	0	0	0	0	0	0	0	0	0
Bee	x	x	-5	-4	-3	-2	-1	0	+1	+2	+3
Cee	x	x	+5	+4	+3	+2	+1	0	-1	-2	-3
Dee	x	x	0	+1	-1	+2	-2	+3	-3	+4	-4

Specimen Gender for the Ay, Bee, Cee, and Dee

F	Entry	Ay	Bee	Cee	Dee
1	K02	Female*	Female*	Female*	Female*
2	K03	Male*	Male*	Male*	Male*
3	K04	Female	Female	Male	Female
4	K05	Female	Female	Female	Male
5	K06	Female	Female	Male	Male
6	K07	Female	Female	Male	Male
5	K08	Female	Male	Male	Female
4	K09	Female	Female	Female	Male
3	K10	Female	Male	Male	Female
2	K11	Female	Male	Female	Female
1	K12	Female	Male	Female	Female

F= Frequency: the number of times this entry is expected to occur out of 36 rolls. * Automatic Entry.

These tables are used in Character Generation; a player creating an individual sophont character for the Ay Bee Cee or Dee would use this table to determine the Caste for the character:

Ay gender characters are predominately Female (out of 36, 3= Male; 33= Female).

Bee gender characters (out of 36, Male= 13; Female= 23).

Cee gender characters (out of 36, Male = 24; Female= 12).

Dee characters (out of 36, Male = 21; Female = 15).

09. LIFE STAGES

The Life Stages page recounts the various developmental periods in the life of a Sophont. Life Stages are reckoned in Terms.

Humans. Humans begin life with a two year infancy (a half Term) followed by nine Life Stages of two Terms each (=74 years.

Non-Humans. Different sophonts can have Life Stages of different lengths. Each Life Stage (after Infancy) may be as short as zero Terms (effectively skipped) and as long as four Terms.

For example, a very-long-lived (and very rare) Sophont could have all Life Stages four Terms (16 years) long. After its two-year Infancy, nine 16-year Terms gives the Sophont a life expectancy of 146 years or more. On the other hand, a very-short-lived (and also very rare) Sophont could roll ones on the Life Stage Duration table: for a two-year infancy, a one Term childhood, and a one Term Peak: giving a Life Expectancy of 10 years.

10. THE SENSES

The Senses page determines the possible senses and their parameters for the Sophont. The senses are more specifically detailed in the Sense chapter.

Senses are identified by Strings of applicable digits that control precisely how a sense works.

Vision. The vision string includes a constant that controls Vision Actions and the three specific wavelengths (sometimes called **colors**, and ranging from the ultra-violet to the infra-red) which can be seen.

Hearing. The Hearing String includes a constant that controls Hearing Actions. It also shows the central sound frequency (and what frequencies on either side) that can be heard; and the central sound frequency (and side frequencies) use by the voice.

Smell. The Smell String includes a constant that controls smelling, and evaluates its sharpness. The characteristic scent for the Sophont is also created.

Touch. The Touch String includes a constant that controls the sense of touch, and evaluates it sensitivity.

Awareness. The Awareness String includes a constant that controls Awareness, and evaluates its acuity.

Perception. The Perception String includes a constant that controls Perception, evaluates its acuity, and gives strength to the ability express oneself in Perception Voice.

Language Medium or Type

The Language used by a Sophont is dependent on the senses available. The tables determine the primary Language form for the sophont.

11. BODY STRUCTURE

The Body Structure page determines the essential structure of the sophont, including the location of the brain and senses, the number and types of limbs, and a variety of body features.

12. SPECIAL ABILITIES

The Special abilities page determines special abilities available to the race as a whole, or to members of genders or castes.

13. MANIPULATORS

The manipulators assigned under Body Structure are illustrated.

14. UNIQUES

In order to take into account non-standard or unusual abilities, body structures, or body processes, the Uniques chart shows several possible concepts.

15. SIZE

The Size chart shows formulae for calculating body size (based on Human=100) for the Sophonts.

Why Aren't These Races Called Aliens?

Humans see non-humans as *aliens*; but non-humans see humans as *aliens*. We need a word that conveys the idea of an intelligent species. Aliens doesn't work. Extra-terrestrial (besides being too long) excludes those who live on Terra, and most humans don't live on Terra anyway. Xeno (Greek for stranger) is basically a synonym for alien.

Sophont (originated by Karen Anderson, and appearing first in works by Poul Anderson about 1966) fits the requirements: "an intelligent being more or less equivalent in reasoning power with humans." Accepted usage excludes machines unless they have true artificial intelligence (and not just great processing power).

AN UNCONVENTIONAL OVERVIEW OF HUMANITY

It is possible to describe a Sophont in alternate ways, each of which has its own validity. A conventional, egalitarian view of humanity produces the WGTS entry below.

From Page 6 of
Wiseman's Guide To Sophonts (Solomani Rim edition).

The Solomani of Terra (Sol 3 [G2 V]

HomeWorld Profile: Terra A877B99-D

Terra (Sol 3) is a temperate world orbiting a G2 V primary.

System Details

The Sol system contains 4 worlds (plus various minor planets and satellites), four gas giants, and one planetoid belt.

Body Structure

Solomani are bilateral bipeds (classified HBS-T-AN-LN-N). The Solomani body structure consists of a head with brain and senses and a torso with two limbgroups. Limbgroup one has arms with hands. Limbgroup three has legs. Under the LG4 FN-FN standard classification system, LG2 LG4 are omitted. The Solomani body is characterized by a bony interior skeleton covered by skin. Interior body fluids are blood.

The Solomani are Plains Walkers: generally adapted to and most comfortable in plains terrain. These sophonts originally occupied the Omnivore Hunter/Gatherer ecological niche. Solomani breathe Air-8.

The genetic profile is SDEIES. The Solomani have an average life expectancy of 74 years. On the standard Imperial Size spectrum (where humans are 100), the Solomani are size ranked 100 .

Gender Structure

The Solomani have a Dual (technically FM) gender structure. The reported gender census (IISS Survey Report: 420-892R) is Female: 51, Male: 49. (shown as percentages).

Gender Based Differences. Observed differences between genders roles include: none significant.

Caste Structure

The Solomani have no apparent caste; any differences within the species appear to be cultural in nature.

Sensory Abilities

The Solomani have a range of senses which includes Vision, Hearing, Smell, and Touch.

The sense of vision is generally Standard; Solomani eyes are sensitive to the band: RGB.

The sense of hearing is generally standard.

The sense of smell is generally inferior.

The sense of touch is generally standard.

The Solomani sense of Vision is dominant.

The racial scent is HUM-7FV (based on an IISS survey).

Special Abilities. Talents.

There is no indication of special abilities or talents.

From Page 6 of
Sophontology Rethought (Solomani Rim edition).

[Only alternative texts shown.]

Gender Structure

The Solomani have a Group (technically 1234) gender structure. The reported gender census (IISS Survey Report: 420-892R) is One: 46, Two: 44, Three: 5, Four: 5 (shown as percentages).

Gender Based Differences. Observed differences between genders roles include:

The One (corresponds to Female) is the baseline.

The Two (corresponds to Male) is generally slightly stronger; slightly less dexterous; slightly less endurant.

The Three (corresponds to Neuter [non-breeding; Male pattern. Gay] is generally equivalent to Male.

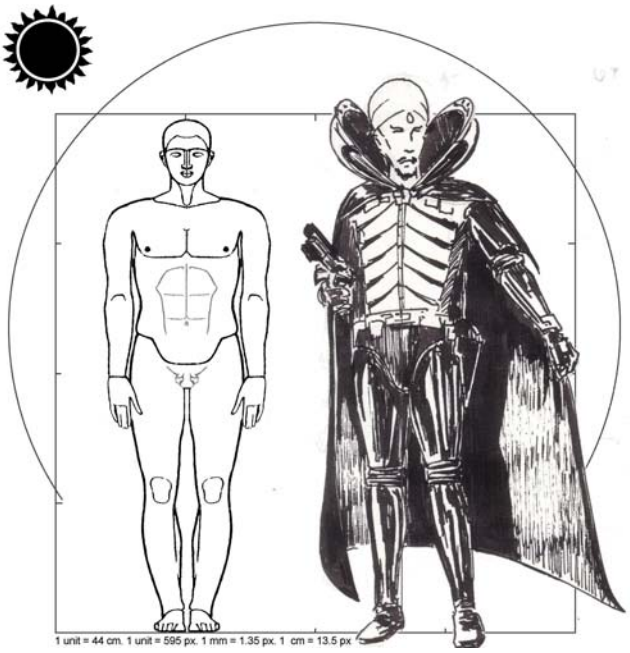
The Four (corresponds to Neuter [non-breeding; Female pattern. Lesb] is generally equivalent to Female.

Special Abilities. Talents.

There are reports that individuals are capable of Psionics at low levels (approximately 10% of the population).

There are reports of individuals capable of Perception.

Supporting materials for this entry are on file at Encyclopediopolis on Reference, and at AAB data repositories throughout the Imperium.



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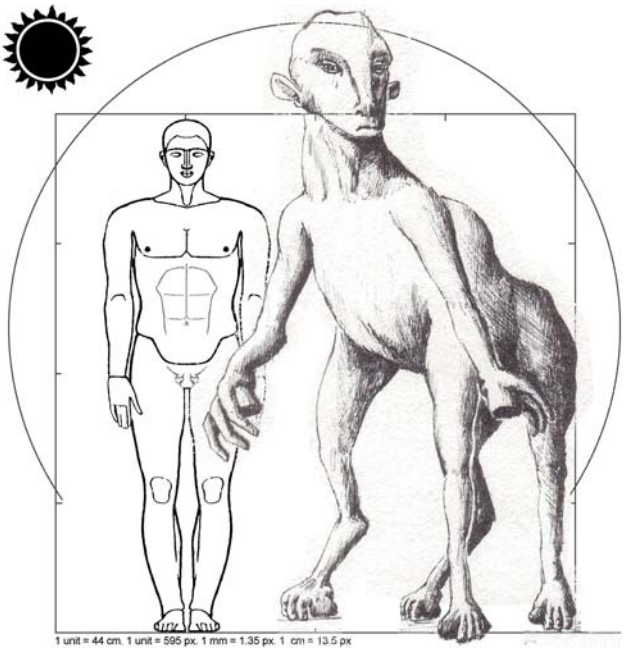
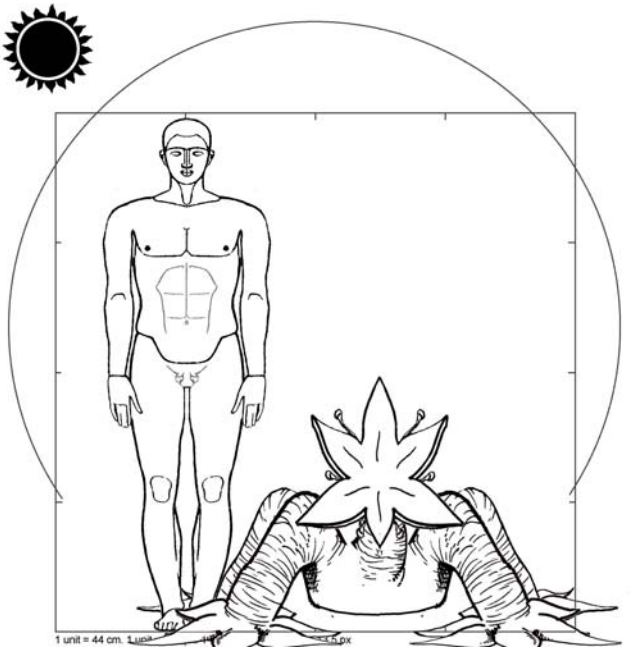
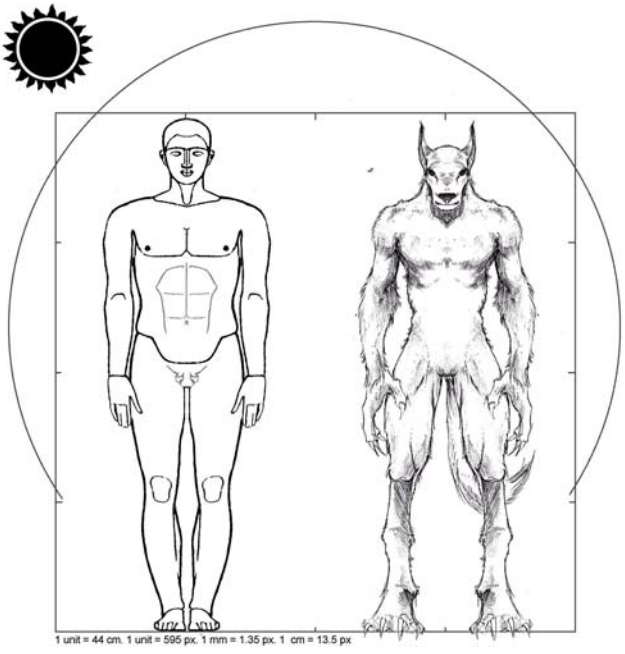


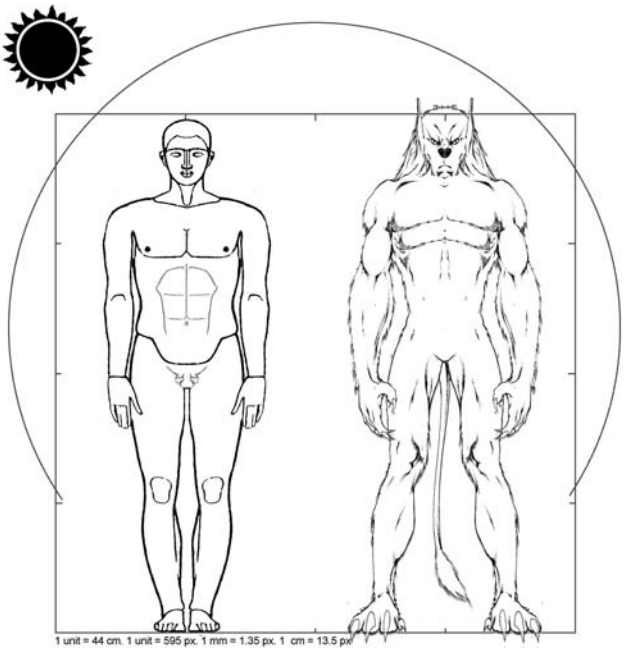
The K'kree of Kirur (Gzang-5 [F1 V]) B863A03-F



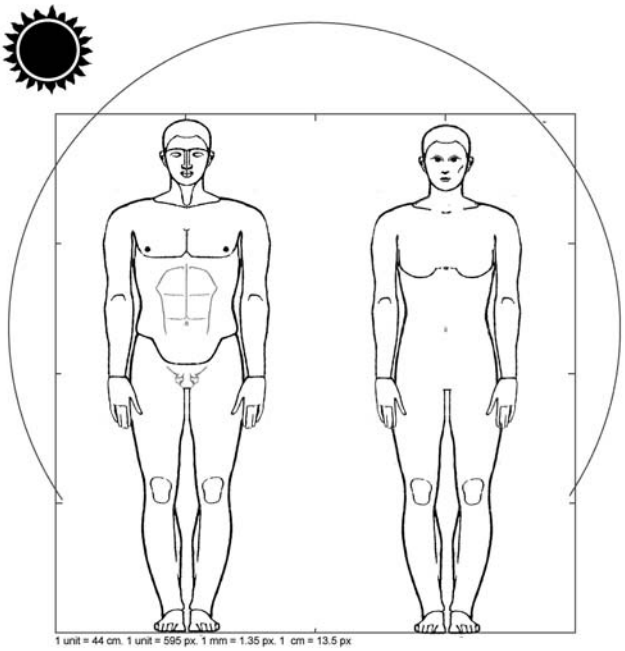
The Hivers of Guaran (Primary- 2 [K1 V]) A667800-F



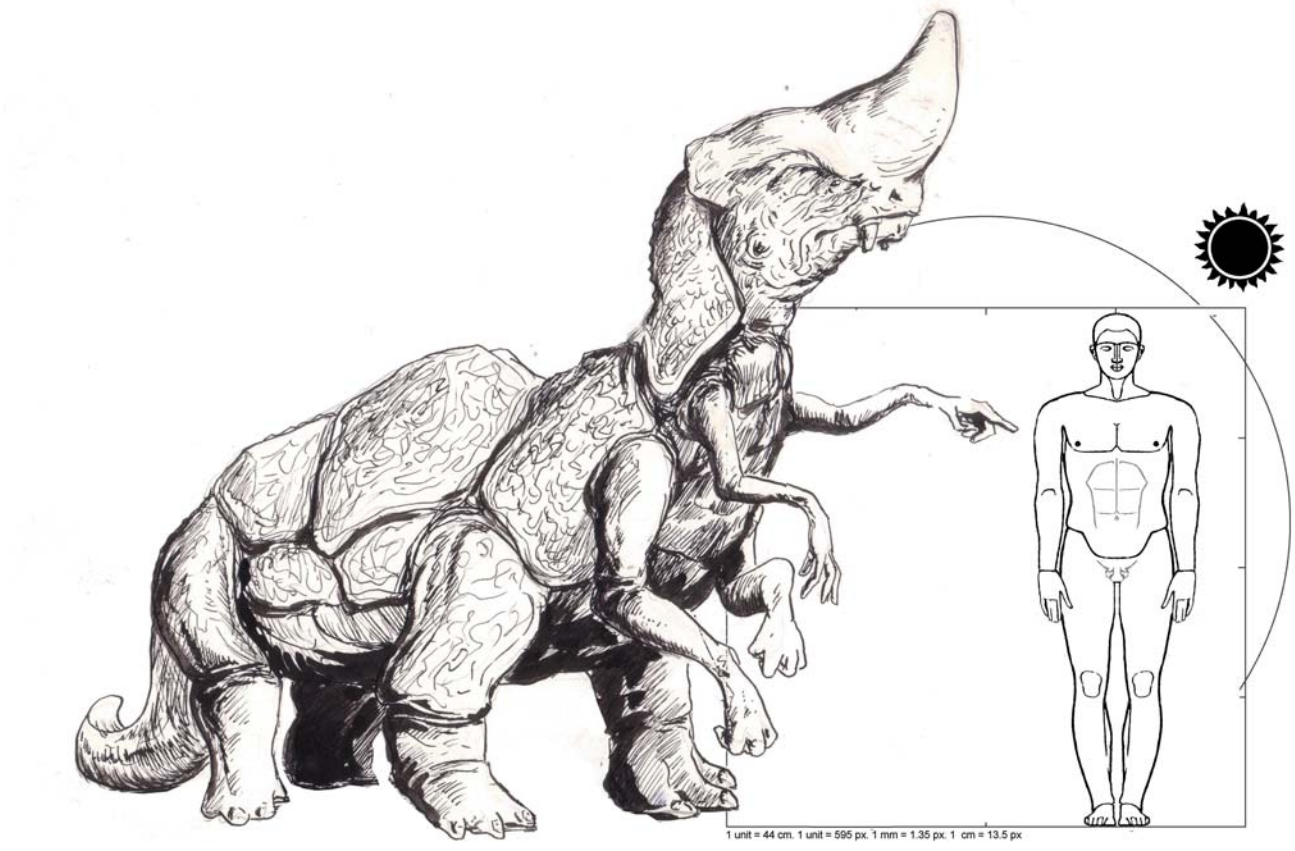
The Vargr of Lair (Kneng-3 [G5 V]) A8859B9-F



The Aslan of Kusyu (Tyeyo-3 [G4 V]) A876986-E



The Humans of Terra (Sol-3 [G2 V])



The Virushi of Virshash (Thintle-0 [M1 D] DA86954-6

Sophont Creation

The Sophont Creation Process creates a Sophont Creation Card SCC which is then used as the basis for basic character generation of the Sophont.

The steps and the charts involved are detailed here.

Sophont-01

Checklist

01. Introduction and Checklist. This introduction is an overview and checklist of the **Traveller** Sophont Creation Process.

02. The Sophont Creation Card records the information needed to generate a **Traveller** character from the created race.

A. Prepare a blank SCC.

03. Blank Fillform.

A. Prepare a blank Fillform.

04. Basics. The process selects or creates a plausible homeworld.

A. Create a Homestar.

1. Flux for Spectral Type (Sp).
2. Roll for Spectral Decimal 0-9.
3. Flux for Spectral Size.

B. Determine Habitable Zone.

C. Create Homeworld.

1. Flux for World or Satellite.
2. Actual Orbit (HZ Var).
3. If Satellite, for Satellite Orbit.
4. Determine Homeworld SAHPG.
5. Note Climate.
6. Name Homeworld.

D. Name the Sophonts.

E. Determine Native Status.

05. Environment. The process determines the evolutionary environment for the Sophonts and states their ecological niche.

A. Native Terrain /Locomotion.

1. Flux for Native Terrain. Record as Environ Roll.
2. 1D for Locomotion Column and select from the Native Terrain row.

B. Ecological Niche.

1. Flux for Basic Class.
2. Flux in the specific Basic Class column.

06. Characteristics. Determine the six personal characteristics for the race.

A. Sophont Characteristics. Flux on columns C1-C2-C3-C4-C5-C6 for characteristic names.

B. Characteristic Values. Flux on columns C1-C2-C3-C4-C5-C6 for Dice for each Characteristic.

07. Caste. If the race has C6= Caste as its social characteristic, then the process determines the details of the racial caste structure. Skip if the race does not have Caste.

A. Caste Structure Types. 1D for Caste Type.

B. Caste Table Creation. Start with Entry 2 on the SCS, roll on the appropriate column for the Caste Entry.

1. Automatic: Entry 7 = Common.

2. Automatic: Entry 12 = Unique.

C. If Skilled Caste, 1D and 1D for each Entry on the Caste Skills Table (Chart 11).

D. Caste Shift.

E. Caste Assignment.

F. Caste Based Differences.

08. Gender. Determine the gender structure of the race.

A. Gender Components.

1. Flux for Gender Structure.
2. For each Entry 2 to 12 on the Gender Generation Table, Flux for specific Gender.

B. Gender Assignment.

C. Gender Shift.

D. Gender Based Differences.

09. Life Stages and Aging. Determine the stages of life through which race members pass: from infancy to retirement. This determines the lifespan and the effects of aging.

A. Enter ½ for Life Stage 0.

B. Life Stage Duration. For each Life Stage 1 to 9, determine its duration.

10. The Senses. Races may have the same senses as humans, or they may be different. The process determines which senses the race has and how the senses function.

A. For each sense, Flux for each possible Sense to determine if present.

B. For each Sense present, Flux on the appropriate columns to create the Sense String.

C. Generate the Racial Scent.

D. Identify the primary Language.

11. Sophont Body Structure. The process determines the basic physical structure (symmetry, number of limb groups, location of the brain case, and location of the senses) of the race. These details may or may not be of any use in most play. Many are for background.

A. Body Structure.

1. Flux for Symmetry.
2. Flux for Head and Torso.
3. Locomotion Type,
   a. Flux for Front Limbs.
   b. Flux for Rear Limbs.

B. Body Features.

1. Flux for Skeleton.
2. Flux for Fluids.
3. Flux for Skin
4. Flux for Weapon.
5. Flux for Manipulators.

12. Sophont Special Abilities.

A. Special Ability

1. Possible Special Ability Type.
2. Flux for Special Ability Row.
3. Adjustments as necessary.

B. Voices.

1. Flux for Voice if Hearing
2. Flux for Pvoice if Perception.

13. Manipulators.

14. Uniques. The creation may implement

1. Metamorphosis.

2. Symbionts.

3. Hibernation.

4. World Condition Effects.

15. Sophont Size. The process allows a calculation of the height and weight and relative size of a member of the race.

16. Example Sophont Description.

17. Example NIL Sophonts.

Sophont Creation Card

The character is the individual through which the player in **Traveller** performs all activity. Most characters are human, and the basic character generation procedures in **Traveller** are for humans.

02 Sophonts

SOPHONT CREATION CARD

Size:

Race Name	LongName			StarName & Orbit
Homeworld	UWP and Trade Classifications			Homestar
Native Status	Environ Flux	Overview		Life Expectancy ____ yrs
Niche and Subniche	Genders ☒	Symmetry ☒		0 ☒
Native Environment and Locomotion ☒	Castes ☒	Head ☒		1 ☒
Breathes ☒	Racial Scent ☒	Torso ☒		2 ☒
Characteristics (GP) SGEIIS	Senses HTP	Limbgroup 1 ☒		3 Chargen Starts ☒
C1 Str ☒	Energy	Vision String ☒	Limbgroup 2 ☒	4 ☒
C2 Dex Agi Gra ☒	Vibration	Hearing String ☒	Limbgroup 3 ☒	5 Physical Aging ☒
C3 End Sta Vig ☒	Volatiles	Smell String ☒	Limbgroup 4 ☒	6 ☒
C4 Int ☒	Contact	Touch String ☒	Tail ☒	7 ☒
C5 Edu Tra Ins ☒	Fields	Aware String ☒	Skeleton ☒	8 ☒
C6 Soc Cha Cas ☒	Auras	Percep String ☒	Skin ☒ Body Fluids ☒	9 Mental Aging ☒

SOPHONT CREATION CARD (BACK)

	C1	C2	C3	C4	C5			C1	C2	C3	C4	C5
G1 1FE						1FE **2**	K02					
G2 2MA						2MA **3**	K03					
G3 3NB						3NB **4**	K04					
G4						**5**	K05					
G5						**6**	K06					
G6						**7**	K07 Common					
Caste Assignment: ☒						**8**	K08					
Caste Shift ☒						**9**	K09					
Gender Assignment ☒						**10**	K10					
Gender Shift ☒						**11**	K11					
Caste-Gender Relation ☒						**12**	K12 Unique					

Identification

Can

	Sophont	The Can of Sanest (Telsenorsec 1 [M0 V])
	Homeworld	Sanest A344000-0 Ba Pa Tz Cold World Omnivore - Gatherer
		NIL: Can: Omnivore Gatherer. Wetlands Flyer. Gender: MF. Symmetry: Bilateral Biped. Limb Groups (WN-LN): Wings with Graspers, Legs, Tailless. Weak Vision: INA, Weak Hearing, Weak Smell, Weak Touch, SDVITS: 222332 Size: 100

Environment

05	Native Status	Extinct Natives
	Being Type	Flyer
	Environment	Wetlands +3
	Niche/ Subniche	Omnivore - Gatherer
	Breathes	Breathes: Water and Air-4
10	Racial Spectra	INA (Local= INA)

Characteristics

06	Genetic Profile	SDVITS	
	C1	Str	2 D
	C2	Dex	2 D
	C3	Vig	2 D
	C4	Int	3 D
	C5	Tra	3 D
	C6	Soc	2 D

The Senses VHST

10	Vision	V-08-INA
	Hearing	H-06-5250
	Smell	S-07-4
	Touch	T-10-2

Physical

11	Overview	N-TBS-WN-LN-T
	Symmetry	Bilateral
	Head	Headless
	Torso	Torso with Brain and Senses
13	Manipulators	Graspers
	LimbGroups	WN-LN
	LG-1	Wings with Graspers
	LG-2	
	LG-3	Legs
	LG-4	
	Tail	Tailless
	Peds	Biped
	Skeleton	Exoskeleton
	Body Fluids	Blood
	Skin	Furry Pelt
	Weapons	Tusks

Life Stages

09	0	Infancy	Half-term	=2 years
	1	Childhood	2	=8
	2	Adolescence	2	8
	3	Young Adult	4	16
	4	Adult	2	8
	5	Peak	2	8
	6	Mid-Life	1	4
	7	Senior	2	8
	8	Elder	1	4
	9	Retirement	1	4
		Life Expectancy		= 70

Details

		100
15	Size	
10	Scent	QTL-DQB
12	Special	-
07	Genders	Dual (order= MF)
08	Castes	

Gender and Caste

	Genders	2D	Castes
07	Female	2	
	Male	3	
08	Female	4	
	Male	5	
	Male	6	
	Male	7	
	Female	8	
	Female	9	
	Female	10	
	Male	11	
	Female	12	

Gender Differences

		Str C01	Dex C02	Vig C03	Int C04	Tra C05
08	G01	0	0	0	0	0
	G02	+5	+4	+3	0	-2
	G03					
	G04					
	G05					
	G06					

Caste Differences

		C01	C02	C03	C04	C05
07	K02					
	K03					
	K04					
	K05					
	K06					
	K07	0	0	0	0	0
	K08					
	K09					
	K10					
	K11					
	K12					

08	
07	
07	
08	Gender is Assigned at Birth
08	Gender is Fixed

08	Gender Census: Female: 47, Male: 52.
07	Caste Census:

Identification

Sophont
Homeworld -

Environment

05

Native Status
Being Type
Environment
Niche/ Subniche -
Breathes
10 Racial Spectra (Local=)

Characteristics

06

Genetic Profile
C1
C2
C3
C4
C5
C6

The Senses

10

Physical

11

Overview
Symmetry
Head
Torso
13 Manipulators
LimbGroups
LG-1
LG-2
LG-3
LG-4
Tail
Peds
Skeleton
Body Fluids
Skin
Weapons

Life Stages

09

		Half-term	=2 years
0	Infancy		
1	Childhood		=
2	Adolescence		
3	Young Adult		
4	Adult		
5	Peak		
6	Mid-Life		
7	Senior		
8	Elder		
9	Retirement		
	Life Expectancy		=

Details

15 Size
10 Scent
12 Special
07 Genders (order=)
08 Castes

Gender and Caste

07

08

Genders	2D	Castes
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	
	11	
	12	

Gender Differences

08

	Str C01	C02	C03	Int C04	C05
G01					
G02					
G03					
G04					
G05					
G06					

Caste Differences

07

	C01	C02	C03	C04	C05
K02					
K03					
K04					
K05					
K06					
K07	0	0	0	0	0
K08					
K09					
K10					
K11					
K12					

08	
07	
07	
08	
08	

08	Gender Census:
07	Caste Census:

Homeworld

Each specific species of sophonts originally evolved on a homeworld with specific details of environment. Basic Information generates this information as part of the species background.

Sophont-04
Homeworld

REQUIRED SYSTEM INFORMATION FOR SOPHONTS

The star system and homeworld data necessary for a sophont include:

Homestar Spectral, Decimal, Size.
World or Satellite (and Satellite Orbit), and Habitable Zone Variation.
Habitable Zone for the System.
Homeworld Name, the SAHPG component of the UWP, and Climate.
Race Name (may be deferred until after generation).
Native Status.

PRE-EXISTING INFORMATION

Additional information may be available because it has been previously generated, or because the sophont is being created for an existing system. The tables here allow creation of the required information if it is not otherwise available.

HOMEWORLD

Sophont generation uses the SAHPG (Size, Atmosphere, Hydrographics, Population, Government) components of the Universal World Profile.

S. Size. Planetary Size: 2D-2.
A. Atmosphere: Flux + Size.
If Size =0, Atmosphere =0.

H. Hydrographics. Flux+ Size.
Maximum A.
If Size =0-1, Hyd =0;
If Atm =0-1 or A+, Hyd DM - 4.
P. Population. 2D-2.
G. Government. Flux +Pop.
Convert negative values to 0.

NATIVES

Sophonts who evolved on the Homeworld are Natives.
Native sophonts are identified as "of" a homeworld.
All other sophonts are identified as "from" a different (native) homeworld.

WORLDS

World. A planet or satellite.
Planet. A world orbiting a star.
Satellite. A world orbiting a planet.
Mainworld. The most important world in a system.
Belt. An asteroid belt (which may be a mainworld).or a planetoid belt

HOMESTAR

Flux	Sp	Size O	B	A	F	G	K	M
- 6	OB	Ia	Ia	Ia	II	II	II	II
- 5	A	Ia	Ia	Ia	II	II	II	II
- 4	F	Ib	Ib	Ib	III	III	III	II
- 3	F	II	II	II	IV	IV	IV	II
- 2	F	III	III	III	V	V	V	III
- 1	G	III	III	IV	V	V	V	V
0	G	III	III	V	V	V	V	V
+1	K	V	III	V	V	V	V	V
+2	K	V	V	V	V	V	V	V
+3	M	V	V	V	V	V	V	V
+4	M	IV	IV	V	VI	VI	VI	VI
+5	M	D	D	D	D	D	D	D
+6	M	D	D	D	D	D	D	D

Size IV is not possible for K5-K9 and M0-M9 stars. Size VI is not possible for A0-A9 and F0-F4 stars.

WORLDS AND ORBITS

2D	World	HZ Var	Satellite Close	Far
- 6	Satellite	- 2	Ay	En
- 5	Satellite	- 1	Bee	Oh
- 4	Satellite	- 1	Cee	Pee
- 3	Satellite	- 1	Dee	Que
- 2	World	0	Ee	Arr
- 1	World	0	Eff	Ess
0	World	0	Gee	Tee
+1	World	0	Aitch	Yu
+2	World	0	Eye	Vee
+3	World	+1	Jay	Dub
+4	World	+1	Kay	Ex
+5	World	+1	Ell	Wye
+6	World	+2	Em	Zee

HABITABLE ZONE ORBIT

Spectral> Size	A0-A3	A4-A8	A9-F1	F2-F6	F7-G1	G2-G8	G9-K3	K4-K8	K9-M3	M4-M8	M9
Ia	12	12	12	12	11	12	12	12	12	12	12
Ib	11	11	10	10	10	10	10	10	10	11	11
II	9	9	8	8	8	8	8	9	9	10	11
III	8	8	7	6	6	6	7	7	8	8	9
IV	7	7	6	6	5	5	5	-	-	-	-
V	7	7	6	5	4	3	2	2	0	0	0
VI	-	-	-	3	3	2	1	0	0	0	0
D	0	0	0	0	0	0	0	0	0	0	0

The Habitable Zone (HZ) orbit number shown here indicates a world surface environment which is hospitable to humans and similar sophonts.

NATIVE STATUS

Note the status of the sophonts.
Transients. Pop = 1-2-3. Locals are present as merchant, corporate, military, or research personnel.
Settlers. Pop = 4-5-6. Locals have settled here but do not (as yet) meet the criteria for colonists or transplants.
Colonists. Gov = 6.
Corporate. If Gov = 1 (employees).
Transplants. Atm = 0-1. Sophonts evolved elsewhere and settled this world many years ago. Not used if Settlers or Transients.
Extinct / Vanished. Pop = 0. The sophonts are Extinct. If Transplants, call them Vanished instead. If TL>0, they are Catastrophic Extinct (or Vanished).
Exotic. Environment (Atm >9) makes these sophonts incompatible with traditional human environments.
Natives. If not Settlers, Colonists, Corporate, or Transplants, they are Natives. Pop 0 or 7+ and Atm 2+.

CLIMATE

A Mainworld in the orbit shown is marked with this climate.

HZ	Temperate	
HZ - 1	Hot	
HZ +1	Cold	
HZ = 0 or 1	Twilight Zone	= Tz
Close Satellite	Locked	= Lk

Hot. At the upper limits of human temperature endurance.
Cold. At the lower limits of human temperature endurance.
Twilight Zone. Tidally locked with a Temperate band at the Twilight Zone, plus a Hot region (hemisphere) facing the Primary and a Cold region (hemisphere) away from the Primary.
Locked. Satellite (Ay through Em) Locked to the planet it orbits. A Locked satellite does not have a Twilight Zone; Its day length equals the time it takes to orbit its planet.

Native Environment

The details of a sophont's evolutionary environment shape its morphology, locomotion, and the ecological niche it occupies.

Sophont-05
Environment

NATIVE TERRAIN

Mountain Steep dominating region. **- 5**

Desert Dry region with sparse vegetation. **- 4**

Exotic Strange or abnormal region. **- 3**

Rough Wood. High density vegetation region. **- 2**

Rough Uneven or broken surface region. **- 1**

Clear Flat expansive unbroken region. **0**

Forest Flat with high vegetation. **+1**

Wetlands Water dominated marsh region. **+2**

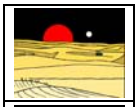
Wetland Wood Water dominated swamp region. **+3**

Ocean Interface of sea and atmosphere. **+4**

Ocean Depths Subsurface ocean regions. **+5**

Preserve this Roll as Environ DM.

TWILIGHT ZONE / LOCKED



Baked Lands Hot Region **- 5**

Twilight Zone Temperate Region **- 0**

Frozen Lands Cold Region **+1**
May include ice-covered

Substitute these Native Terrain names if the Homeworld is Twilight Zone or Locked.

NATIVE EVOLUTIONARY ORIGINS

A natively-evolved sophont has, as its origins, the following elements:

Native Terrain. A specific type of terrain in which the sophont had its earliest origins. Native Terrain in turn influences Locomotion.

Locomotion. The essential self-powered, patterned motion of limbs (or other anatomical parts) system of movement used by the sophont.

NATIVE TERRAIN AND LOCOMOTION

Flux	Native Terrain	Roll 1D 1	2	3	4	5	6
- 5	Mountain	Walker	Walker	Walker	Walker	Walker	Flyer
- 4	Desert	Walker	Walker	Walker	Walker	Walker	Flyer
- 3	Exotic	Amphib	Walker	Walker	Walker	Flyphib	Flyer
- 2	Rough Wood	Amphib	Walker	Walker	Walker	Walker	Flyer
- 1	Rough	Amphib	Walker	Walker	Walker	Walker	Flyer
0	Clear	Walker	Walker	Walker	Walker	Walker	Walker
+1	Forest	Walker	Walker	Walker	Walker	Walker	Walker
+2	Wetland	Amphib	Aquatic	Walker	Walker	Walker	Flyer
+3	Wetland Wood	Amphib	Walker	Walker	Walker	Walker	Flyphib
+4	Ocean	Flyphib	Swim	Swim	Swim	Diver	Diver
+5	Ocean Depth	Diver	Diver	Diver	Diver	Diver	Diver

If Atm 8+, DM - 2. If Size 5-, DM – 1. If Hyd 6+, DM +1. If Hyd 9+, DM +1
Greater than highest entry, use +5; less than minimum entry, use - 5.

SOPHONT MORPHOLOGY

Type	Walks	Dives	Swims	Flies	Other	Breathes
Walker	Walks	-	-	-	-	Air- <Atm>
Amphibian	Walks	-	Swims	-	-	Air- <Atm> and Water
Aquatic	Walks	-	Swims	Flies	-	Air - <Atm>
Diver	-	Dives	Swims	-	-	Water
Flyer	Walks	-	-	Flies	-	Air- <Atm>
Flyphib	-	Dives		Flies	-	Air- <Atm> and Water
Swimmer	-	-	Swims	-	-	Air- <Atm>
Static	-	-	-	-	Immobile	Air- <Atm>
Drifter	-	-	-	-	Drifts	Water

Walks. Moves (walks, jumps, crawls) on land. **Swims.** Moves in water at or near surface. **Dives.** Moves in water, in the depths. **Flies.** Moves in atmosphere. **Breathes.** Insert Homeworld Atmosphere after Air. Static and Drifter apply only if Producer.

ECOLOGICAL NICHE

Flux	Niche	Herbi-	Omni-	Carni-	Scavenger	Producer
- 6	Producer	Grazer	Hunter	Pouncer	Carrion-Eater	Collector
- 5	Producer	Grazer	Hunter	Pouncer	Carrion-Eater	Collector
- 4	Herbivore	Grazer	Hunter	Pouncer	Carrion-Eater	Collector
- 3	Herbivore	Intermittent	Hunter	Pouncer	Hijacker	Collector
- 2	Omnivore	Intermit	Hunter	Pouncer	Hijacker	Collector
- 1	Omnivore	Intermit	Gatherer	Pouncer	Hijacker	Collector
0	Omnivore	Intermit	H / G	Chaser	Intimidator	Basker
+1	Omnivore	Grazer	Gatherer	Chaser	Intimidator	Basker
+2	Omnivore	Grazer	Gatherer	Chaser	Intimidator	Basker
+3	Carnivore	Grazer	Gatherer	Chaser	Intimidator	Basker
+4	Carnivore	Grazer	Gatherer	Trapper	Intimidator	Basker
+5	Scavenger	Grazer	Gatherer	Siren	Reducer	Basker
+6	Scavenger	Filter	Eater	Killer	Reducer	Basker

Roll Flux for Niche; then Flux in the appropriate column.
Apply Environment Roll to appropriate columns (but not Basic Class).

Characteristics

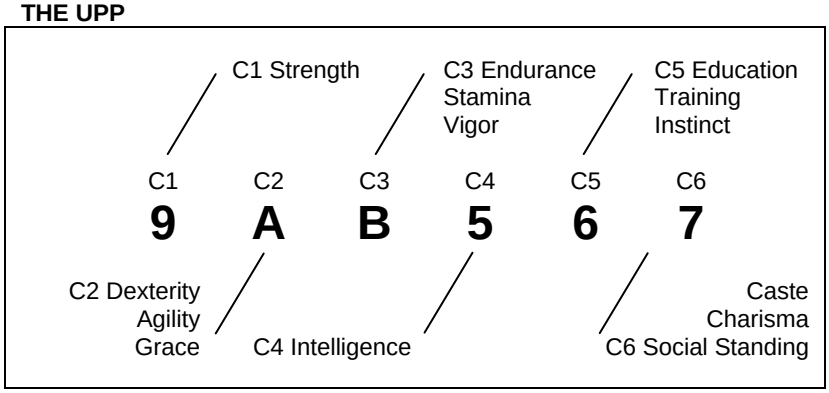
Sophonts, like standard human **Traveller** characters, have six distinct characteristics: three physical, two mental, and one social.

The specific characteristics are determined by this system.

Sophont-06

Characteristics

THE UPP



The Universal Personality Profile (UPP) records the six characteristics as single digits using the hex code (the Ehex code if values exceed F).

CHARACTERISTICS

Possible personal characteristics include:

Char		Characteristic	H*	Description	GP Letter
C1	Str	Strength	H	physical power and ability.	S
C2	Dex	Dexterity	H	body and eye-hand coordination.	D
C2	Agi	Agility	A	overall body coordination.	A
C2	Gra	Grace	A	overall body-limb coordination.	G
C3	End	Endurance	H	physical resistance to fatigue.	E
C3	Sta	Stamina	A	long-term ability to pursue a task.	S
C3	Vig	Vigor	A	short-term ability to resist fatigue.	V
C4	Int	Intelligence	H	natural ability to think and reason.	I
C5	Edu	Education	H	achievement level of schooling	E
C5	Tra	Training	A	based on cultural heritage	T
C5	Ins	Instinct	A	based on genetic heritage.	I
C6	Soc	Social Standing	H	position in large group hierarchy.	S
C6	Cha	Charisma	A	position in small group hierarchy.	C
C6	Cas	Caste	A	position in genetic group hierarchy.	K

H= Human characteristic (may be present in non-humans). If all characteristics are H, the species may be (but is not necessarily) Human.

A= Analog (non-human) characteristic.

All races have Strength and Intelligence. A race may have Dexterity or one of its analogs: Grace or Agility. A race may have Endurance or one of its analogs: Stamina or Vigor.

A race may have Education or one of its analogs: Training or Instinct.

A race may have Social Standing or one of its analogs: Charisma or Caste.

In many cases, a characteristic can be used as its analog (usually with a penalty), but other restrictions may also apply.

Genetic Profile GP. The six initial letters of the characteristics for a species comprise the Genetic Profile. The letters in the GP have meaning dependent on position (for example, S in position 1 indicates Strength, and in position 3 indicates Stamina). Because two characteristics in position 6 have the initial letter C, use K for Caste. For example, Human is SDEIES (Strength, Dexterity, Endurance, Intelligence, Education, Social Standing).

Non-Biological Elements. It is possible for other characteristics to be present in artificial beings (and not of importance here).

THE CHARACTERISTICS

C1		Strength	
C2	Agility	Dexterity	Grace
C3	Vigor	Endurance	Stamina
C4		Intelligence	
C5	Training	Education	Instinct
C6	Charisma	Social Standing	Caste

SOPHONT CHARACTERISTICS

Flux	C1	C2	C3	C4	C5	C6
-5	Str	Agi	Sta	Int	Ins	Cas
-4	Str	Agi	Sta	Int	Ins	Cha
-3	Str	Agi	Sta	Int	Ins	Soc
-2	Str	Agi	Sta	Int	Ins	Soc
-1	Str	Dex	End	Int	Edu	Soc
0	Str	Dex	End	Int	Edu	Soc
+1	Str	Dex	End	Int	Edu	Soc
+2	Str	Gra	Vig	Int	Tra	Soc
+3	Str	Gra	Vig	Int	Tra	Soc
+4	Str	Gra	Vig	Int	Tra	Cas
+5	Str	Gra	Vig	Int	Tra	Cha

For characteristics C1 through C6, roll Flux to determine each specific characteristic.

If species is Flyer, DM -2. Flyers are more likely to have Agi, Sta, and Ins

If species is Swimmer or Diver, DM +2. Swimmers and Divers are more likely to have Gra, Vig, and Tra.

CHARACTERISTIC VALUES

	__Physical____			_Mental__		Social
	C1	C2	C3	C4	C5	C6
		Agi	Sta		Ins	Cas
		Gra	Vig		Tra	Cha
Flux	Str	Dex	End	Int	Edu	Soc
- 5	1D	1D	1D	1D	1D	1D
- 4	1D	1D	1D	1D	1D	1D
- 3	2D	2D	2D	2D	2D	2D
- 2	2D	2D	2D	2D	2D	2D
- 1	2D	2D	2D	2D	2D	2D
0	2D	2D	2D	2D	2D	2D
+1	2D	2D	2D	2D	2D	2D
+2	3D	3D	3D	3D	2D	2D
+3	3D	3D	3D	3D	2D	2D
+4	4D*	4D*	4D*	3D	2D	2D
+5	5D*	5D*	5D*	4D*	2D	2D
+6	6D*	6D*	6D*	4D*	2D	2D

Roll separately on the proper column for each characteristic. Rolls above the entries on the table use the highest entry; rolls below the entries on the table use the lowest entry.

Physical: Roll Flux, DM+ Environ Flux.

C3: If Chaser, +2. If Pouncer, -2.

C5 (Edu/Tra): Always 2D for sophonts.

C6 (Cas): See the Caste tables.

*** IF** the value is 4D 5D 6D roll 4D= 12 + 2D, 5D= 12 + 3D, or 6D= 12 + 4D.

Castes

For those species which have Caste, it rigidly assigns social and economic roles within the community unit. The differentiation of caste roles between species which have Caste varies widely.

The Caste Tables are skipped if the race does not have Caste.

Sophont-07
Castes

THE CASTE GENERATION TABLE

The Caste Generation Table on the Sophont Creation Card is unique to the race being described; it determines castes of the race, and in what proportion they occur.

Determine the Caste Structure.

Roll Flux on Caste Table Creation and place that result in entry 2 on the Sophont Creation Card. Continue until all entries 2-12 have been made. Some castes may be duplicated; others may not be present depending on the die roll.

CASTE STRUCTURE TYPES

1D	Caste Structure
1	**Body.** Caste roles recapitulate roles within the body.
2	**Economic.** Caste roles are economic functions.
3	**Family.** Caste roles are functions within the family unit.
4	**Military.** Caste roles establish military organization.
5	**Social.** Caste roles are elements of a social hierarchy.
6	**Skilled.** Caste roles dictate unique skills for each member.

Caste Structures are metaphors for social or economic structures.

Casteless. An individual who has not (or not yet) been assigned Caste is Casteless.

CASTE TABLE CREATION

	Flux	Body	Economic	Family	Military	Social	Special
	- 5	Healer	Innovator	Healer	Medic	Artist	DeMinimus
=Gender	- 4	=Gender	=Gender	=Gender	=Gender	=Gender	Useless
	- 3	Antibody	Guard	Defender	Aide	Enforcer	Advisor -
	- 2	Sensor	Researcher	Caregiver	Scout	Drone	Instructor
	- 1	Memory	Artisan	Caregiver	Specialist	Artist	Shaman
Common	0	Muscle	Laborer	Breadwinner	Soldier	Unit	Expendable
	+1	Muscle	Craftsman	Breadwinner	Technician	Unit	Defective
	+2	Muscle	Clerk	Breadwinner	Warrior	Unit	Valuable
	+3	Voice	Manager	Uncle	Leader	Patron	Advisor+
=Special	+4	=Special	=Special	=Special	=Special	=Special	Sport
	+5	Claw	Entrepreneur	Leader	Staff	Entertainer	Vice-Leader
=Unique	X	Brain	Director	Archon	General	Ruler	

=Gender (Flux - 4). Caste is the Gender with the same roll on the parallel Gender Determination Table on the Sophont Creation Card.

=**Common (Flux 0).** Automatically insert the Common Caste at Entry 7 on the table.

=**Special (Flux +4).** Re-roll on the Special column.

=**Unique Caste (Entry 12).** The Unique Caste is automatically inserted at Entry 12.

Skilled Caste Type. Each individual member of the Skilled Caste rolls on the Skilled Caste table during Character Generation and receives that Skill with level equal to C5.

Caste Digits: The specific Caste Characteristic digit for the UPP is the highest die roll on the Caste Table which creates this Caste.

THE SKILLED CASTE

The Specific Skill. The individual receives a Skill or Knowledge randomly from the Skill List. Caste Skill is ultimately equal to C5 (Edu, Tra, or Ins).

The Caste name for an individual is the skill held. For example, Author, Pilot, or Gunner.

As in the other Castes,
Flux -4 = Gender;
Flux +4 = Special.
Entry 12 = Leader.

The skill distribution for the Skilled Caste varies by clan, region, or group. Different groups within the species can have different Skilled Caste tables.

CASTE-BASED DIFFERENCES

Flux	C1	C2	C3	C4	C5
- 5	- 5	- 5	- 5	- 5	-5
-4	- 4	- 4	- 4	- 4	- 4
-3	- 3	- 3	- 3	- 3	- 3
-2	- 2	- 2	- 2	- 2	- 2
-1	--	--	--	--	--
0	--	--	--	--	--
+1	--	--	--	--	--
+2	+2	+2	+2	+2	+2
+3	+3	+3	+3	+3	+3
+4	+4	+4	+4	+4	+4
+5	+5	+5	+5	+5	+5

Common is the baseline Caste; differences are from this value. C5 is Ins (but not Edu or Tra).

Roll for each Caste Type other than Common; roll once within each Caste Type for each Characteristic.

Caste-Based Differences are imposed at Caste Assignment.

CASTE SHIFT

1D	Shift
1	No shift
2	No shift
3	No shift
4	No shift
5	Mid-Life Shift
6	Rotation

Caste may change in the course of a lifetime.

Mid-Life Shift. Assign (reroll on the table) a new Caste at the start of Life Stage 6.

Rotation. Advance Caste at the start of each Life Stage. Caste 12 promotes to Caste 2.

If Caste Shifts, Caste-Based Differences also shift. Existing Caste skills remain; and a available new Caste skills are acquired one per year.

CASTE ASSIGNMENT

1D	Assignment	Life Stage
1	Random (Assigned At Birth)	0
2	Random (Assigned At Adolescence)	2
3	Random (Assigned By Heredity)	0
4	Random (Assigned By The Community)	0
5	Selected (Family Choice)	2
6	Selected (Personal Choice)	2

Random. Use the Caste Table on the Sophont Creation Card for a character being generated.

Selected. The player chooses Caste.

Before Assignment. An individual is Casteless (without Caste) until it is assigned.

Inherited Caste is subject to special rules.

ASSIGNMENT IN THE SKILLED CASTE

Within the Skilled Caste, a member receives one level of the Caste Skill or Knowledge each year, beginning when Caste is assigned, until the level equals Edu, Tra, or Ins. The levels received are in addition to any other skills received.

Gender Structure

Gender indicates the evolutionarily established reproductive roles within a race. Gender may include physical differentiation between the members of the genders and other distinctive differences.

Sophont-08
Gender

THE GENDERS

There are six possible genders for any specific race, and there are a variety of gender structures which make use of them.

Solitaire. Individuals reproduce without participation of an alternate gender mate.

Dual. Two individuals of different genders pair for reproduction.

FMN. Three distinct genders exist, of which only two participate in reproduction. Gender 1 is Female (F), Gender 2 is Male (M), and Gender 3 is Neuter (N).

EAB. Three individuals come together for reproduction. Gender 1 is Egg Donor (E), Gender 2 is Activator (A), and Gender 3 is Bearer (B).

Group. Many individuals come together for reproduction. Genders are identified as numbers One, Two, Three, Four, Five, and Six (not all are necessarily present).

Structure	Gender1	Gender2	Gender3	Gender4	Gender5	Gender6
Solitaire	Solo	--	--	--	--	--
Dual	Female	Male	--	--	--	--
FMN	Female	Male	Neuter	--	--	--
EAB	Egg Donor	Activator	Bearer	--	--	--
Group	One	Two	Three	Four	Five	Six

COMPLETING A GENDER GENERATION TABLE

The Gender Generation Table on the Being Creation Card is unique to the race being described; it determines genders of the race, and in what proportion they occur.

Beginning with entry 2 on the form under Gender Generation, roll Flux and consult Gender Components. Based on the result, consult the appropriate column and continue until all entries 2-12 have been completed. Some possible genders may be duplicated; others may not be present depending on the die roll results.

THE CASTE - GENDER RELATION

1D	Relationship
1	Dependent
2	Dependent
3	Casted Breeder
4	Casted Breeder
5	Independent
6	Independent

Dependent. Each caste is always of one specific gender. Caste determines Gender.

Casted Breeder. The first gender (1FE) is always the breeder caste and is identified as by the gender name. All other castes may be any gender. Apart from 1FE, Caste and Gender are independently determined.

Independent. Caste and Gender are determined independently.

GENDER COMPONENTS

Flux	Structure	Solitaire	Dual	EAB	FMN	Group
-5	Solitaire	Female	Female	Egg	Female	Six
-4	Solitaire	Female	Female	Egg	Female	Six
-3	EAB	Female	Female	Egg	Female	Four
-2	EAB	Female	Female	Activator	Male	Four
-1	Dual	Female	Male	Egg	Female	Two
0	Dual	Female	Female	Activator	Male	One
+1	Dual	Female	Male	Bearer	Neuter	Three
+2	FMN	Female	Male	Bearer	Neuter	Five
+3	FMN	Female	Male	Bearer	Neuter	Five
+4	Group	Female	Female	Activator	Male	Six
+5	Group	Female	Male	Bearer	Neuter	Six

On the Gender Determination Table, enter Gender 1 (Female, Egg, or One) on entry line 2. If Dual, FMN, or EAB, enter Gender 2 (Male, Activator) on entry line 3. If FMN or EAB, enter Gender 3 (Neuter, Bearer) on entry line 4. For each remaining entry line, roll Flux on the appropriate column and enter the result.

GENDER-BASED DIFFERENCES

Flux	C1	C2	C3	C4	C5
- 5	- 5	- 5	- 5	- 5	-5
-4	- 4	- 4	- 4	- 4	- 4
-3	- 3	- 3	- 3	- 3	- 3
-2	- 2	- 2	- 2	- 2	- 2
-1	--	--	--	--	--
0	--	--	--	--	--
+1	--	--	--	--	--
+2	+2	+2	+2	+2	+2
+3	+3	+3	+3	+3	+3
+4	+4	+4	+4	+4	+4
+5	+5	+5	+5	+5	+5

Roll once within each Gender for each Characteristic. C5 is Ins (but not Edu or Tra). Roll for each Gender Type other than 1FE;

GENDER ASSIGNMENT

Flux	Assigned By	Shifts?
- 5	by Family	Progression
-4	at Maturity	Progression
-3	at Maturity	Fixed
-2	at Birth	Fixed
-1	at Birth	Fixed
0	at Birth	Fixed
+1	at Birth	Fixed
+2	at Birth	Fixed
+3	at Maturity	Fixed
+4	at Maturity	Transform
+5	by Individual	Transform

Maturity = Life Stage 2.

BEFORE GENDER ASSIGNMENT

If Gender is not assigned at birth, the individual's Gender prior to assignment is Neuter.

GENDERS MAY SHIFT

Individual Initial Gender Assignment is based on the Gender Determination.

If Gender is not Fixed, it will shift under one of the following structures:

Progression. Individual changes gender at the beginning of each Life Stage. The new gender is the next higher entry on the Gender Table on the Sophont Creation Card (which also means that gender may remain the same).

Transform. Individual transforms from one specific gender to another (randomly determined) once at Mid-Life Life Stage 6. It is possible that the new gender may be the same as the old gender.

Gender-Based Differences shift when Gender shifts.

Life Stages

The Life Stages of a Race determine when a Sophont begins an adult career, when an individual begins to feel the effects of age, when an individual expects to retire, and the traditional lifespan for the Sophont.

Sophont-09
Life Stages

THE NINE STAGES OF LIFE

Every sophont's life is a succession of Life Stages, each with its own particular significance. Understanding the Life Stages for a Sophont helps understand the psychology which governs its members. These stages include:

No.	Life Stage	Description	Human=
0.	**Infant.**	A helpless infant under the care of an adult member of the family.	0 - 1
1.	**Child.**	An immature individual receiving basic education.	2 - 9
2.	**Teen.**	A gender mature individual not yet fully responsible in society. Gender and Caste maturity.	10 -17
3.	**Young Adult.**	A physically mature individual with full responsibilities in society. Character Generation begins.	18 -25
4.	**Adult.**	A full member of society.	26 -33
5.	**Peak.**	An individual at the height of physical and mental abilities. Physical aging begins.	34 -41
6.	**Mid-Life.**	An individual approximately half way through a typical life span.	42 -49
7.	**Senior.**	An experienced individual.	50 -57
8.	**Elder.**	An individual at the greatest levels of personal achievement.	58 -65
9.	**Retirement.**	An individual is living on the fruits of his prior labors. Mental aging begins.	66 -74

Life Stage 2. The first two years of 2-Teen is the period of Gender maturity, and (if the Race has Caste) of Caste maturity.
Cadets. Cadet characters are generated and start play at the beginning of year 3 of Teen. (=12 for Humans).
Life Expectancy (or traditional lifespan) is the sum of the lengths of the Life Stages. For example, Humans have a 2-year infancy and nine stages of 8 years each, producing a traditional lifespan of 74 years.

LIFE STAGE DURATION

	Infant	Child	Teen	Young Adult	Adult	Peak	Mid Life	Senior	Elder	Retired
Flux	0	1	2	3	4	5	6	7	8	9
- 5	1/2	1	0	0	0	1	0	0	0	1
- 4	1/2	1	1	1	1	1	1	1	1	1
- 3	1/2	1	1	1	1	1	1	1	1	1
- 2	1/2	1	1	1	1	1	1	1	1	1
- 1	1/2	2	2	2	2	2	2	2	2	2
0	1/2	2	2	2	2	2	2	2	2	2
+1	1/2	2	2	2	2	2	2	2	2	2
+2	1/2	3	3	3	3	3	3	3	3	3
+3	1/2	3	3	3	3	3	3	3	3	3
+4	1/2	4	4	4	4	4	4	4	4	4
+5	1/2	6	6	6	6	6	6	6	6	6

Duration is shown in 4-year Terms (1 = one term of four years).

Life Stages for each sophont may vary in length.

This chart indicates the number of terms (4 year terms) the sophont spends in a Life Stage. Infancy is automatically one-half term (2 years). A result of 0 indicates that a particular Life Stage is skipped (or has an extremely short duration of perhaps a few weeks).

Beginning with Life Stage 1, roll Flux for each Life Stage and record the number of terms for each Stage on the Being Creation Card.

AGING

Aging affects the character's physical and mental characteristics, ultimately reducing them to zero and inflicting death.

Characters are immune to Aging for roughly the first half of their lives. Once Aging begins, it occurs every term on the character's birthday and may reduce individual characteristics.

Physical Aging

Sophont Physical Aging affects the Physical Characteristics C1 Strength, C2 Dexterity Agility Grace, and C3 Endurance Stamina Vigor. It begins at the beginning of Life Stage 5- Peak) and is resolved as an Aging Check.

Mental Aging

Sophont Mental Aging affects Intelligence and Instinct (if present). It begins at the beginning of Life Stage 9- Retirement and is resolved as an Aging Check..

THE AGING CHECK

The Aging Check is resolved every four years on the character's birthday. The Crisis is rolled for each applicable Characteristic.

To Feel Age Effects (The Aging Check)
2D < Life Stage
Success inflicts -1 on the characteristic.
(A character wants to FAIL this action).

If one Characteristic is reduced to 0, it is reset to 1.

If two Characteristics are reduced to 0, the character suffers an illness and spends four weeks in rest and recuperation. The two characteristics are each reset to 1.

If three Characteristics are reduced to 0, the character suffers a major illness and must spend four months in rest and recuperation. The three characteristics are each reset to 1. The second time three characteristics are reduced to 0, the character dies.

The Senses

There are six possible senses, of which all Sophonts have Touch, and they may or may not have one or more of the others.

The senses are defined and described using the human senses as the baseline.

THE SENSES

Each sense concentrates on one specific phenomenon of the six broad types that senses can perceive.

The six categories are:

Vision sees wavelengths of light (possibly infrared or ultraviolet).

Hearing hears sound (possibly infrasonic or ultrasonic).

Touch feels objects (including sensing of patterns, textures, shapes, temperature, and other information).

Smell and **Taste** sense an identifiable aspect of objects. The two are treated as one sense.

Awareness senses electrical or magnetic fields.

Perception senses biological or sentient auras.

Other senses are possible, but they are either minor in scope or too exotic in execution for this system to handle. When they are present, they are administered as exceptions or through special rules.

Sense Strings. Capabilities of the senses are conveyed by Sense Strings.

SENSE STRINGS

Sense	String	Elements					
Vision	V-00-RGB	V-	Constant-	Band1	Band2	Band3	
Hearing	H-00-FSVR	H-	Constant-	Freq	Span	Voice	Range
Smell	S-00-S	S-	Constant-	Sharpness			
Touch	T-00-S	T-	Constant-	Sensitivity			
Awareness	A-00-A	A-	Constant-	Acuity			
Perception	P-00-AV	P-	Constant-	Acuity	PVoice		

THE SENSES

Flux	Constant	Vision	Hearing	Smell	Touch	Aware	Percep
-5	06	Blind	Deaf	Anosmic	Touch	Unaware	Oblivious
-4	08	Blind	Deaf	Anosmic	Touch	Unaware	Oblivious
-3	10	Blind	Deaf	Anosmic	Touch	Unaware	Oblivious
-2	12	Vision	Deaf	Anosmic	Touch	Unaware	Oblivious
-1	14	Vision	Hearing	Anosmic	Touch	Unaware	Oblivious
0	16	Vision	Hearing	Smell	Touch	Unaware	Oblivious
+1	18	Vision	Hearing	Smell	Touch	Aware	Oblivious
+2	20	Vision	Hearing	Smell	Touch	Aware	Percept
+3	22	Vision	Hearing	Smell	Touch	Aware	Percept
+4	24	Vision	Hearing	Smell	Touch	Aware	Percept
+5	26	Vision	Hearing	Smell	Touch	Aware	Percept

Roll Flux once on each Sense column and note the Senses received on the Sophont Creation Card (the sense of Touch is automatic). Roll Constant for EACH Sense received. For each Sense received, consult the specific chart for that Sense and create the Sense String.

	VISION			HEARING					SMELL		TOUCH		AWARE		PERCEPT		
Flux	C	Band	Star	C	Freq	Span	Voice	Range	C	Sharp	C	Sensi	C	Acuity	C	Tone	PVoice
-6	04	DHV	B0-B3	04	1	0	1	0	04	0	04	0	04	0	04	0	0
-5	06	UDH	B5-B8	06	1	0	1	0	06	1	06	1	06	1	06	1	1
-4	08	SUD	B9-A1	08	2	1	2	0	08	1	08	1	08	1	08	1	1
-3	10	PSU	A2-A8	10	3	1	3	0	10	1	10	2	10	2	10	2	2
-2	12	BPS	A9-F6	12	4	2	4	0	12	1	12	2	12	2	12	2	2
-1	14	GBP	F7-G1	14	5	2	5	1	14	2	14	3	14	3	14	3	3
0	16	RGB	G2-K0	16	6	3	6	2	16	3	16	3	16	3	16	3	3
+1	18	CRG	K1-K3	18	7	4	7	3	18	4	18	3	18	3	18	3	3
+2	20	ACR	K4-K6	20	8	4	8	3	20	5	20	4	20	4	20	4	4
+3	22	NAC	K7-K9	22	9	5	9	3	22	5	22	4	22	4	22	4	4
+4	24	INA	M0-M1	24	A	5	A	4	24	6	24	5	24	5	24	5	5
+5	26	FIN	M2-M4	26	B	6	B	4	26	6	26	5	26	5	26	5	5
+6	28	XFI	M5-L8	28	C	6	C	4	28	6	28	6	28	6	28	6	6
+7	30	ZXF	L9+	30	D	7	D	4	30	6	30	6	30	6	30	6	6

LANGUAGE MEDIUM

Sophonts typically communicate by an efficient language based on their available senses under the following priorities:

If The Sense Combination is	
Hearing	Verbal Language
Perception, Deaf	Perceptual Language
Vision, Deaf, Oblivious	Visual Sign Language
Touch, Deaf, Oblivious, Blind	Tactile Sign Language

SOME SENSES ABSENT

Blind= No Vision.
Deaf= No Hearing.
Anosmic= No Smell.
Unaware= No Awareness.
Oblivious = No Perception.

THE RACIAL SCENT

Generate the Racial Scent using 1D and 1D for each of the six digits, producing a scent in the format ABC-DEF.

RACIAL SCENT

D	1	2	3	4	5	6
1	1	2	3	4	5	6
2	A	B	C	D	E	F
3	G	H	I	J	K	L
4	M	N	O	P	Q	R
5	S	T	U	V	W	X
6	Y	Z	7	8	9	0

The sophont, like all living creatures, has a characteristic scent which it emits, and which can be sensed by others.

Human is HUM.

Body Structure

The physical appearance of the race is determined by body symmetry, number of limb groups, location of the braincase and senses, armor status of the body, natural weaponry, and number of eyes and ears.

BODY STRUCTURE				Flyer		Walker		Aquatic Amphibian		Diver Swimmer		Flyphib		
Flux	Symmetry	Head and Torso		Front	Rear	Front	Rear	Front	Rear	Front	Rear	Front	Rear	Tail
-5	Asymmetrical	HS	TB	WW	WW	AA	LL	AA	FF	AA	FF	FF	FF	P
-4	Asymmetrical	HS	TB	WW	WM	AA	LL	AA	LF	AA	LF	WW	FM	V
- 3	Asymmetrical	HS	TB	WA	WL	AN	LN	AF	LL	AF	LL	WA	FL	T
-2	Bilateral	HBS	T	WA	WN	AN	LN	AF	LN	AF	LN	WA	FN	T
-1	Bilateral	HBS	T	WL	WN	LL	LN	AL	FN	AL	FN	WL	FF	N
0	Bilateral	HBS	T	WL	LN	LL	LN	AL	FN	AL	FN	WL	FN	N
+1	Bilateral	HBS	T	WL	LN	LL	LN	AL	LN	AL	LN	WL	FN	N
+2	Trilateral	HBS	T	WN	LN	LN	LN	AW	WL	FF	FF	WN	FN	N
+3	Trilateral	N	TBS	AN	LM	AL	LM	AF	WF	AF	FF	FN	FN	N
+4	Radial	N	TBS	AN	MM	AL	MM	AF	FM	AF	FM	FN	FM	M
+5	Radial	N	TBS	AA	NN	AN	NN	AN	MM	AN	MM	FF	NN	A

Symmetry. Indicates general structure of the body. Bilateral limbs are in pairs; Trilateral limb groups are triplets; Radial limb groups have 1D limbs per group. Asymmetrical has 1D limbs per group (roll for each limb group). DM -2 if Grace. +2 if Agility. +2 if Swimmer or Diver.

Head and Torso. One roll determines both Head and Torso. Note that the Brain is not necessarily located in the Head, but there is only one Brain.

Limb Group Structure. Using Environment Type (Flyer, Walker, Amphibian, Swimmer, Diver, Flyphibian) roll for Front limbs and Rear limbs. Front Limbs terminate in Manipulators; Rear Limbs do not have Manipulators.

Tails. Roll for the presence of a Tail. Manipulator is a prehensile tail. Proboscis is technically not a tail; it is a Trunk emanating from the Head (if no head, from the front of the Torso).

BODY STRUCTURE OVERVIEW

The Body Structure Overview presents in capsule form the details of the head, torso, limbs, and tail of the sophont in the format:

A-B-CD-EF-G

A= Head (with or without Brain and Senses), B= Torso (with or without Brain and Senses), CD= Front Limbs (with Manipulators), EF= Rear Limbs, and G= Tail / Proboscis.

Stance. A sophont is horizontal (and has Length rather than Height) if it has NO rear limb groups, or more Rear limb groups than Front limb groups. All others are Vertical and have Height (not Length).

HEAD, TORSO, AND LIMB CODES

Head And Torso

HS	Head with Senses
HBS	Head with Brain and Senses
N	No Head
T	Torso
TB	Torso with Brain
TBS	Torso with Brain and Senses

Limb Groups

A	Arms
F	Flippers
L	Legs
M	Multiple Leg Groups
N	No Limbs
W	Wings

Tail/Proboscis

A	Antennae
M	Manipulator
N	No Tail
T	Tail
V	Vestigial Tail
P	Proboscis

BODY FEATURES

Flux	Skeleton	Fluids	Skin	Weapon	Manipulators
- 6	Fluid Interior Sacs	Foam	Feathery Pelt		Tentacles
-5	Fluid Interior Sacs	Foam	Feathery Pelt		Tentacles
-4	Fluid Interior Sacs	Lymph	Furry Pelt	Tusks	Tentacles
- 3	Cartilege Interior	Hemolymph	Hairy Pelt	Fangs	Grippers
-2	Cartilege Interior	Ichor	Leather	Teeth	Grippers
-1	Bony Interior	Blood	Skin	-	Hands
0	Bony Interior	Blood	Skin	-	Hands
+1	Bony Interior	Blood	Skin	-	Hands
+2	Exoskeleton	Gore	Fine Scales	Claws	Paws
+3	Exoskeleton	Slime	Scales	Hooves	Graspers
+4	Segmented Shell	Scum	Spines	Spikes	Graspers
+5	Segmented Shell	Humours	Plates	Sting	Sockets
+6	Segmented Shell	Humours	Plates	Sting	Sockets

DM +1 if Swimmer Flyer. DM - 1 if Flyer.

Body Feature Terms

Skeleton. The type of interior support structure.

Fluids. Typical body fluids.

Skin. General description of body covering.

Armor. General description of natural armor (value = 2D)

Weapon. General description of natural weapon.

Manipulators. Front Limbs terminate in Manipulators (Rear Limbs do not). Manipulators on Legs are dual use (thus doubling as Feet or Peds).

If otherwise no Manipulators, assume Mouth is Manipulator.

Special Abilities

A sophont may have special abilities (for every member, or for specific members based on gender or caste).

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Special Abilities

CASTE SKILLS LIST EXPANDED

		Die C					
A	B	1	2	3	4	5	6
1	1	Recon	Aeronautics	Admin	Advocate	SoundMimic	ACV
1	2	Spines	Aquanautics	Artillery	Artist	Biologics	Author
1	3	Sensors	Automotive	Astrogator	Beams	Computer	Broker
1	4	Actor	Bureaucracy	Craftsman	Compute	Driver	Mole
1	5	Flyer	BattleDress	Dancer	Diplomat	Explosives	Medic
1	6	Empath	Engineer	Designer	Exotics	G-Drive	Grav
2	1	Flapper	Fluidics	Electronics	Forensics	J-Drive	Math
2	2	Leader	Heavy Wpns	Engineer	Legged	Liaison	JOT
2	3	Tracked	Launcher	Gravitics	Mechanic	Athlete	Trader
2	4	Pilot	Magnetics	Hostile Env	Ordnance	Blades	LTA
2	5	Animals	Life Support	Language	P-Plant	Counsellor	Sail
2	6	Tactics	Photonics	Musician	Sapper	Ortillery	Ship
3	1	Turrets	Programmer	Strategy	Small Craft	Fighting	Rotor
3	2	Seafarer	Slug Thrower	M-Drive	Stealth	Osmancer	Rider
3	3	Survey	Naval Arch	Navigation	Survival	Wheeled	Sprays
3	4	Comms	Streetwise	Polymers	Trainer	Screens	Sub
3	5	Teacher	Teamster	Spacecraft	Animals	Steward	Wing
3	6	Unarmed	Vacc Suit	Starships	No Skill	Zero-G	WMD

Roll die A (if greater than 3, reroll) and die B for row; roll die C for column.

SPECIAL ABILITIES

	1	2	3	4	5	6
Flux	The Arts	Talents	Talents	Senses	Disability	Trades
- 5	Actor	Insight	Math	Touch	-	Biologics
- 4	Actor	Empath	Math	Touch	Stench	Biologics
- 3	Dancer	Hibernate	Memorize	Vision	Blind	Mechanics
- 2	Artist	Hypno	SoundMimic	Hearing	Deaf	Mechanics
- 1	-	-	-	-	-	-
0	-	-	-	-	-	-
+1	-	-	-	-	-	-
+2	Music	Intuition	Mem < - >	Awareness	Unaware	Craftsman
+3	Artist	Rage	Mem < - >	Perception	Oblivious	Craftsman
+4	Osmance	ReGen	Mem < - >	Smell	Anosmic	Electronic
+5	Osmance	Curiosity	Mem < - >	Smell	Anosmic	Electronic

It is entirely possible that a race may have no special ability. If a Special Ability is present, the individual generated character receives = 1D. Roll 1D for the column, followed by Flux for the row which applies.

Sophont Based Special Abilities. Consult this table once for the Race.

Gender Based Special Abilities. Consult this table once for each Gender..

Caste-Based Special Abilities Consult this table once for each Caste.

Adjustments to Special Abilities.

Music: If Deaf and Oblivious, reroll.

Smell: If Anosmic, reroll.

Mem < - >. Roll for the Sense associated. 1= Vision. 2= Audio. 3= Scent. 4= reroll. 5= Aware. 6= Percep. If the sense is absent, reroll.

SoundMimic: If Deaf, reroll.

Senses: If the sense is currently absent, the recipient Gender or Caste acquires the sense. Create its String. If the sense is present, increase the Constant for the recipient Gender or Caste by +2.

Disability: If the sense is already absent, there is no effect.

Morph: If Internal Structure= Fluid Filled Sac, if 1D= 5 or 6, Sophont has Morph.

CASTE SKILLS LIST SHORT

1D	1D	Skill List 1	Skill List 2
1	1	Actor	Heavy Wpns
1	2	Admin	Hi-G
1	3	Animals	Hostile Env
1	4	Art	Insight
1	5	Astrogator	JOT
1	6	Athlete	Language
2	1	Author	Lawyer
2	2	BattleDress	Leader
2	3	Biologics	Liaison
2	4	Broker	Mechanic
2	5	Bureaucracy	Medic
2	6	Carouse	Music
3	1	Command	Naval Arch
3	2	Comms	Photonics
3	3	Computer	Pilot
3	4	Counsellor	Polymers
3	5	Craftsman	Programmer
3	6	Dancer	Recon
4	1	Designer	Sapper
4	2	Diplomat	Seafarer
4	3	Driver	Sensors
4	4	Electronics	Stealth
4	5	Engineer	Steward
4	6	Explosives	Strategy
5	1	Fighting	Streetwise
5	2	Fluidics	Survey
5	3	Flyer	Survival
5	4	Forensics	Tactics
5	5	Forward Obsv	Teacher
5	5	Gambler	Trader
6	1	Gravitics	Vacc Suit
6	2	Gunner	Zero-G
6	3	Biologics	Mechanic
6	4	Electronics	Photonics
6	5	Fluidics	Polymers
6	6	Gravitics	Programmer

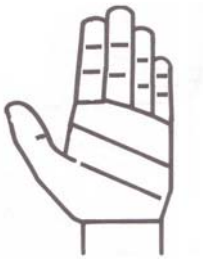
Select Skill List 1 or Skill List 2.

TYPES OF VOICES

Flux	Code	Voice	PVoice
0	0	Mute	Mute
-5	1	Whistles	Faint
-4	2	Whistle	Vague
-3	3	Vowels	Common
-2	4	Musical	Firm
-1	5	Standard	Strong
0	6	Standard	Powerful
+1	7	Standard	
+2	8	Guttural	
+3	9	Consonantal	
+4	A	Clicks Pops	
+5	B	Mimic	

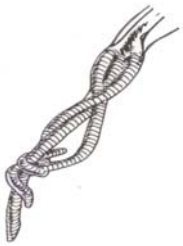
Manipulators

Sophonts need to manipulate their environment; most do so with hands or hand-like manipulators. The common forms of manipulators are hands, paws, tentacles, gripper, graspers, and sockets.



Hands
The termination of a limb consisting of two opposed groups of one or more moderately flexible digits, capable of holding an object.

Paws
The termination of a limb consisting of several unopposed moderately flexible digits which can grasp and hold an object.



Tentacles
The termination of a limb capable of entwining or coiling. The termination may be one tentacle, or it may be more than one working together.

Graspers
The termination of a limb consisting of three or more mutually opposed flaps or digits capable of clamping an object between them.

Grippers
The termination of a limb consisting of two opposed groups of relatively inflexible flaps or digits capable of clamping an object between them.

Sockets
The termination of a limb consisting of a hollow rimmed with muscle capable of holding an object within it. It may have an internal tentacle-like manipulator.

USING MANIPULATORS

Manipulators determine precisely how a sophont handles objects and operates mechanisms.

Grip. Grip is the strength which a manipulator adds (or doesn't add) when holding an object. Grip is a mod for tasks using Strength and involving manipulators.

USING CONTROLS WITH MANIPULATORS

Controls are the interface between a sophont and an object. They range from simple handles to keypad inputs.

CONTROLS

	Grip	Preferred	Optimized	Alien	Touch
Hand	0	0	0	- 1	0
Paw	- 2	0	- 1	- 3	-1
Tentacle	+1	0	0	- 1	0
Grasper	0	0	0	- 2	-2
Gripper	+2	0	- 1	- 3	-1
Socket	- 1	0	0	- 2	-3

The Mod shown applies when using the manipulator with the control type shown.

Touch Mod is used with the Touch Sense Action

Typical Controls

The grip or handle and trigger mechanism on a weapon.
The adjusting knobs on a communicator.
The operating levers and mechanism on a vehicle.
The input devices on computers and equipment.

Preferred Controls. Controls adapted to a specific manipulator (for example, Paw Controls, Tentacle Controls). Properly used Preferred Controls have no mods.

Optimized Controls. Controls specifically designed to be used by all possible manipulators. Optimized Controls have fewer disadvantageous mods. Many vehicles have Optimized Controls.

Alien Controls. Non-optimized controls not adapted for the manipulator being used (for example Paw controls being used by Hands). Alien Controls are subject to disadvantageous mods.

Configurable Controls

Controls capable of being adjusted to Preferred Controls. Configuration time varies, as does the actual effectiveness of the configured format.

Unique Circumstances

Some sophonts have unusual or unique physical or life cycle structures. These uniques may be implemented for specific sophonts are necessary. This list is not exhaustive.

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Uniques

METAMORPHOSIS

The sophont individual undergoes one or more abrupt and dramatic changes in physical structure or form, typically when the sophont advances from one Life Stage to the next. At its simplest, Metamorphosis occurs once and the sophont changes abruptly; in more complex structures, the sophont repeatedly transforms into new and different forms.

The Changes. When a sophont Metamorphosizes, it takes on a totally new physical structure: create a NEW sophont to be the next stage: the only firm requirement is that the new form must be larger than the old form.

Life Stages. Each change takes place at the beginning of a Life Stage.

Metamorphic Stages. The Table gives a series of Metamorphic Stage names. Their precise meaning for a sophont may differ from the classic biological meaning. For example, Egg is the name of the lowest or earliest of Metamorphic Stages rather than necessarily an ovoid immobile form.

SYMBIONTS

The sophont lives in a paired relationship with another organism.

Dominated Carrier. An external or visible sophont (the Carrier) is inhabited by an interior symbiont (Dominant) acting as the brain. The Carrier is typically deficient in Mental Characteristics; the Dominant is typically diminutive by highly intelligent.

A Dominant can be transferred from Carrier to Carrier.

Assisted Carrier. The Carrier is inhabited by an interior symbiont (Assistant). Both Carrier and Assistant are intelligent and interact to process information.

An Assistant can be transferred from Carrier to Carrier.

AVAILABLE METAMORPHIC STAGES

Egg.
Embryo.
Larva.
Nymph.
Pupae.
Subimago.
Imago.
Postimago
Adult.
Post Adult.

HIBERNATION

The sophont undergoes a long-term hibernation (typically lasting a full life stage).

UNIQUES

This system cannot cover every possible situation. Where necessary, or where desired, unique elements of the Sophont structure can be inserted. Such Uniques may change, supplement, complement, or supersede any of the other sophont information. For example,

The Shriekers of Shvireeyiyi experience an intense aging crisis at Life Stage 5.

The Intferhi of Beta Hydrae have two heads.

THE EFFECTS OF WORLD CONDITIONS

The conditions of the homeworld have an effect of the abilities of the sophont. Sophonts from worlds with extremes of Hot, Cold, Light, and Radiation react to the damage they inflict differently.

Sophont From

Normal	Hot World	Cold World	Normal	Rad World	Normal	Bright World
Hot-4	Hot-3	Hot-5				
Hot-3	Hot-2	Hot-4				
Hot-2	Hot-1	Hot-3				
Hot-1		Hot-2				
--	Cold-1	Hot-1	--		--	
Cold-1	Cold-2		Rad-1		Flash-1	
Cold-2	Cold-3	Cold-1	Rad-2	Rad-1	Flash-2	Flash-1
Cold-3	Cold-4	Cold-2	Rad-3	Rad-2	Flash-3	Flash-2
Cold-4	Cold-5	Cold-3	Rad-4	Rad-3	Flash-4	Flash-3

Sophont Size

The physical height and weight of a character can be determined from the physical characteristics in the UPP.

BEING SIZE

Size is a measure of the volume (and to some extent the weight) of a sophont. Size is measured in units approximately equal to one liter (1000 liters to a cubic meter). As a very rough measure, Size is also the mass of a person or sophont in kilograms. The size standard or benchmark is Human = 100. Size for a sophont is based on the three physical characteristics C1 C2 C3 (and according to the Calculating Size Table).

Individual Size

To determine the size of an **individual** sophont,

Total the physical characteristics for the individual (halving Grace and Agility; doubling Stamina). Divide the total by 21 and multiply by 100. The result is individual sophont size.

Calculating Species or Sophont Size

C1 Strength	Char	
C2 Dexterity	Char	
C2 Grace	Char / 2	makes it lighter or smaller
C2 Agility	Char / 2	makes it lighter or smaller
C3 Endurance	Char	
C3 Stamina	Char * 2	makes it heavier or larger
C3 Vigor	Char /2	makes it lighter or smaller

Char= Individual rolled Characteristic Value (for example, if Str = 7, Char = 7).

Total= C1 + C2 + C3
Individual Size = 100 * (Total / 21).

For example, a Human SDEIES rolls 2D each for C1 C2 C3 physical characteristics and the result is 777 = 21/ 21 = 1 * 100 = 100. This human is totally average in size.

For example, a Hexaphant SDSIES rolls 3D+12, 2D, 3D +12 for C1 C2 C3 physical characteristics and the result is M9T= 21 + 9 + 54 = 84 / 21 = 4 * 100 = Size 400. This individual is larger than the average Hexaphant and large by any measure.

Average Size

To determine the average size for a Sophont,

Total the number of dice used to generate the Physical Characteristics (halving Grace, Agility, and Vigor; doubling Stamina). Divide the total by 6 and multiply by 100. The result is typical size for the sophont.

Calculating Species or Sophont Size

C1 Strength	Dice	
C2 Dexterity	Dice	
C2 Grace	Dice / 2	makes it lighter or smaller
C2 Agility	Dice / 2	makes it lighter or smaller
C3 Endurance	Dice	
C3 Stamina	Dice * 2	makes it heavier or larger
C3 Vigor	Dice /2	makes it lighter or smaller

Dice= Number of dice rolled for the characteristic (for example, if Str = 2D, Dice = 2).

Total= C1 + C2 + C3
Typical Size = 100 * (Total / 6).

For example, a Human SDEIES rolls 6D (2D + 2D + 2D) for C1 C2 C3 physical characteristics = 6 / 6 = 1 * 100 = 100. A Human is size 100.

For example, a Hexaphant SDSIES rolls 12D (5D + 2D + 5D) = 5+ 2 + 5*2 = 17/6 = 2.83* 100 = 283. A Hexaphant is size 283.

If the Sophont has Mods on the die rolls, add or subtract fractional dice (+1 = +0.16; -1 = -0.16). For example, a Sssnth SDEIES rolls 6D-3 (2D-1 + 2D-1 + 2D -1) for physical characteristics C1 C2 C3 = 6-.5 = 5.5/6 = 0.91 *100 = 91.A Sssnth is Size = 91.

SMALL, STANDARD, OVERSIZE, AND TITAN

Sophonts (and all users: robots, armored suits) fall into four broad classes: Small, Standard, Oversize, and Titan. All four classes are approximations, with wide variation in the specifics.

Small (about 50). A small number of sophonts fall into the Small Size Class. Small assumes the individual is less than 1 meter tall and less than 50 kg mass. C1 C2 C3 are probably created with 1D each.

Standard (about 100). Humanity and most sophonts fall into the Standard Size Class. Standard assumes the individual is approximately 1.5 to 2 meters tall and less than 100 kg mass. C1 C2 C3 are probably created with 2D each.

Oversize (about 200). A few sophonts fall into the Oversize Size Class. Oversize assumes the individual is approximately 3 to 4 meters tall (possibly altered by a multi-legged horizontal stance) and masses 400 to 800 kg. C1 C2 C3 are probably created with 3D each.

Titan (about 300). A very few sophonts are in the Titan Size Class. Titan assumes the individual is approximately 4 to 5 meters tall (possibly altered by a multi-legged horizontal stance) and masses 1 to 2 tons. C1 C2 C3 are probably created with 4D or 5D each.

Armor and Robots

Armor for sophonts, and Humaniform or Sophontiform robots are produced in Standard (same size as the Sophont), Oversize (double size), and Titan (triple size).

For example, an Oversize Humaniform Robot is twice the size (height) of a human. A Titan Battledress for a human is triple the size (height) of a standard robot.

From Page 1269 of **Wiseman's Guide To Sophonts** (Deneb edition).

The Enmiish of Garkila (Uug 5 [F4 V]).

HomeWorld Profile: Garkila D4209CC-A

Garkila (Uug 5) is a temperate world orbiting a F4 V primary. Garkila is a desert world. The Enmiish homeworld is a poor non-agricultural industrial world. Garkila is a high population world diversely populated by an eclectic mix of natives (approximately 54%), transplanted groups, and others (humans = 36%).

System Details. The Uug system includes four worlds (plus various minor planets and satellites), two gas giants, and no planetoid belts.

Body Structure

Enmiishs are bilateral bipeds (classified HBS-T-AN-LN-N). The Enmiish body structure consists of a head with brain and senses and a torso with two limbgroups.. Limbgroup one has arms with graspers. Limbgroup three has legs. Under the LG4 AN-LN standard classification system, LG2 LG4 are omitted. The Enmiish body is characterized by a exoskeleton covered by scales. Interior body fluids are gore.

The Enmiish are Wetlands Walkers: generally adapted to and most comfortable in wetlands terrain. These sophonts originally occupied the Omnivore Gatherer ecological niche. Enmiish breathe Water and Air-2.

The genetic profile is SASIEK. The Enmiish have an average life expectancy of 60 years. On the standard Imperial Size spectrum (where humans are 100), the Enmiish are size-ranked 116 .

Gender Structure

The Enmiish have a Dual (technically MF) gender structure. The reported gender census (IISS Survey Report: 420-175Y) is Female: 47, Male: 52. (shown as percentages; may not total 100% due to rounding).

Gender Based Differences. Observed differences between gender roles include: The Male is somewhat stronger, is slightly more agile, has somewhat less stamina, and is considerably smarter.

Caste Structure(subject to change based on additional data).

The Enmiish have a Social caste structure based on random caste assignment at birth (presumably through hormone and enzyme interactions). Caste assignments do not shift during the lifetime of the individual. Observed caste roles include Patron, Unit, Artist, Unit (var-1), Unit (var-2), Unit (var-3), Enforcer, Unit (var-4), Entertainer, Unit (var-5), and Ruler. A reported caste census (IISS Survey Report: 420-175Y) is 5-Social: Artist: 7, Enforcer: 12, Unit: 58, Patron: 2, Entertainer: 7, Ruler: 2.

The Patron has somewhat more stamina, and is substantially less smart. The Unit is slightly stronger, is slightly less agile, and is slightly smarter. The Artist is somewhat smarter. The Unit (var-1) is considerably less agile, has slightly less stamina, and is somewhat smarter. The Unit (var-2) is somewhat less agile, and is substantially less smart.

The Unit (var-3) is the baseline against which other Castes are compared.

The Enforcer is slightly weaker, and has slightly less stamina. The Unit (var-4) has somewhat less stamina, and is slightly less smart. The Entertainer is slightly more agile. The Unit (var-5) is considerably weaker, is slightly less agile, has slightly less stamina, and is slightly smarter.

The Ruler is somewhat weaker, is slightly less agile, has slightly more stamina, and is considerably smarter.

The reasons for the variations (physiological and/or mental differences) (marked (var-)) within caste roles remains unclear.

Sensory Abilities

The Enmiish have a range of senses which includes Vision, Hearing, Smell, Touch, and Percept.

The sense of vision is somewhat superior; Enmiish eyes are sensitive to the band: GBP.

The sense of hearing is generally somewhat inferior. Enmiish hear in the range 2^2 to 2^6 hertz. Enmiish voices are generally in the range 2^3 to 2^7 hertz. Enmiish voices are not audible to humans. Human voices are audible to Enmiish. For reference, humans hear in the range 2^6 to 2^12 and speak in the range 2^7 to 2^9. A dog whistle is about 2^14.

The sense of smell is generally slightly inferior.

The sense of touch is generally superior.

Perception is generally slightly superior.

The Enmiish sense of Touch is dominant.

The racial scent is KPX-41F (revised from previous data).

Special Abilities and Talents. There are reports that individuals are capable of Teleken

Additional World Data and Commentary (omitted)

The standard short description of a sophont uses the format from the **Pocket Edition of Wiseman's Guide to Sophonts**. About 30 words paint a picture of the sophont's appearance and capabilities, and a traveller venturing to a world benefits from reviewing the **Wiseman's Guide to Sophonts** before arrival.

NATIVE INTELLIGENT LIFE

Reference:		Comments:
03-D	NIL: Sophont Name.	NIL= Native Intelligent Life.
04-B-1 and 2	Niche and Subniche.	
04-A-1 and 2	Terrain and Locomotion.	
06-A	Caste.	Omitted if no Caste.
07-A	Gender Structure.	Genders shown with more numerous first.
10-A-1 and 3b	Symmetry and Peds.	
10-A-3	Limb Group Structure.	
09	Senses.	Include Adjective if Constant outside the range 12-20
05-A and B	Genetic Profile and Content.	
12	Size.	

Example:	**NIL:** Kugurgam: Herbivore Intermittent. Forest Walker. Gender: BAE. Symmetry: Bilateral Biped. Limb Groups (AN-LN): Arms with Hands, Legs, Tailless. Enhanced Vision- BPS, Enhanced Hearing, Enhanced Touch. SAEIIS: 221222 Size: 66.	From Page 198 of the **Pocket Wiseman's Guide To Sophonts** (Deneb edition).

	NIL: Lasousshesan: Omnivore Hunter. Plains Walker. Gender: MFN. Symmetry: Bilateral 8-ped. Limb Groups (AN-LM): Arms with Paws, Legs, Three Leg Groups, Manipulative Tail. Enhanced Vision: XFI, Enhanced Hearing, Touch, SDVITS: 323332 Size: 133	From Page 1011 of the **Pocket Wiseman's Guide To Sophonts** (Deneb edition).

	NIL: Viigvi: Omnivore Gatherer. Jungle Walker. Gender: FM. Symmetry: Asymmetrical No-ped. Limb Groups (AN-NN): 4 Arms with Sockets, Tailless. Weak Vision: NAC, Enhanced Hearing, Smell, Enhanced Touch, Weak Aware, Enhanced Percept, SGEIES: 313332 Size: 108	From Page 923 of the **Pocket Wiseman's Guide To Sophonts** (Deneb edition).

	NIL: Enaphsul: Omnivore Hunter. Forest Walker. Gender: FNM. Symmetry: Bilateral Quadruped. Limb Groups (NL-NL): Legs with Hands, Legs, Tailless. Hearing, Touch, SDEIES: 322222 Size: 116	From Page 514 of the **Pocket Wiseman's Guide To Sophonts** (Deneb edition).

Sense Constant Adjective		
1	11	Weak
12	20	Normal
21	30	Strong

Brief Skill Knowledge Talent Descriptions

The descriptions of the skills, knowledges, and talents available are intended to be comprehensive without being exhaustive. Alternate names are shown in parens.

Academia (Academics) is the general Knowledge associated with the profession of scholar.

Actor (Act, Acting) is ability in the dramatic arts.

ACV (Air Cushion Vehicle) is the Knowledge associated with the operation of vehicles using ACV technology.

Admin (Administration, Management) is skill in the management of resources and involves setting policy and communicating policy to members of the organization.

Advocate (Advocacy, Law) is skill in formulating and presenting logical and emotional arguments on behalf of themselves and others, primarily in a legalistic setting.

Aeronautics is the Knowledge of Flyer maintenance and repair. It contrasts with the other Knowledges under Flyer in that it is deeply concerned with repair, modification, and maintenance rather than operation.

Animals is skill in working with animals: to use them for sport, recreation, business, or other enterprises.

Aquanautics is the Knowledge of watercraft maintenance and repair. It contrasts with the other Knowledges under Watercraft in that it is deeply concerned with repair, modification, and maintenance rather than operation.

Archeology is the scientific study of civilizations, societies, and cultures

Army is the general Knowledge associated with the profession of soldier.

Art (Artist) is ability in the visual arts.

Artillery is the Knowledge associated with the targeting, operation, and maintenance of the artillery weapons systems.

Astrogator (Astrogation) is skill in the determination of present location and course planning to a selected destination in an interplanetary or interstellar setting.

Athlete (Athletics) is skill in sports-related physical activity and competition.

Author (Writer, Writing) is ability in the literary arts.

Automotive is the Knowledge of ground vehicle maintenance and repair. It contrasts with the other Knowledges under Driver in that it is deeply concerned with repair, modification, and maintenance rather than operation.

BattleDress is skill in the use, care, and repair of personal combat armor. It also covers the use of Portable (a specialized term) Weapons.

Bay Weapons is the Knowledge associated with large starship weapons installations (those mounted in Bays).

Beams is the Knowledge associated with the use, maintenance, and repair of personal energy weapons.

Biologics is concerned with devices based on living matter.

Biology is the scientific study of living organisms

Blades is the Knowledge associated with the use, maintenance, and repair of blade or edged weapons.

Boat is the Knowledge associated with the operation of small watercraft.

Broker is skill in the marketing of goods, and represents an understanding of the business of buying and selling.

Bureaucrat (Bureaucracy) is skill in the standardized procedures within an organization, and the ability to interpret and follow those procedures.

Capital is the general Knowledge associated with Capital, the center of the Imperium.

Career is the general Knowledge associated with a specific <Career>.

Carouse is the interpersonal activity associated with casual social interaction.

Chef is the ability in the arts associated with taste and smell (typically food preparation).

Chemistry is the scientific study of matter at the atomic, molecular, and macromolecular levels

Command is the interpersonal activity associated with giving orders or issuing commands.

Comms (Communications) is skill in the use of technological communications equipment with a focus on primary data input.

Compute is the native ability to perform detailed or extensive information processing rapidly and without external aids or devices.

Computer (Office Equipment) is skill in the use of technological office equipment and focuses on non-primary data input.

Counsellor is skill in providing advice, guidance, or recommendations to individuals, with its emphasis on personal or interpersonal behavior.

Craftsman (Craftsperson) is concerned with the production of high quality work output.

Curiosity is an intuition relating to the serendipitous acquisition of information.

Dancer (Dance) is ability in the arts associated with body movement.

Designer (Design) is skill in creating new objects using available principles, components, and concepts.

Diplomat (Diplomacy) is skill in formal negotiation between governments or large organizations.

Driver is skill in the operation of ground vehicles.

Electronics is concerned with devices based on electron flow.

Empath is the native ability to sense and understand the emotions of others.

Engineer (Engineering) is skill in the operation, maintenance, and repair of the drives of starships and spacecraft.

Exotics is the Knowledge associated with the use, maintenance, and repair of strange, unorthodox, or unusual personal weapons.

Explosives (Demolitions) is skill in the use of high energy devices for destructive purposes.

Fighting is skill in conflict resolution through violence.

Flapper is the Knowledge associated with the operation of aircraft which use flapping wings.

Fleet Tactics is concerned with the command and control of groups of ships for naval combat operations.

Fluidics is concerned with devices based on fluid flow and interaction.

Flyer is skill in the operation of flying craft.

Forensics (Forensic Science) is skill in investigation, especially when related to legal matters.

Forward Obsv (Forward Observer) is skill in directing military or naval attacks against targets.

Gambler (Gambling) is skill in variety of games of chance, and includes a familiarity with the degrees of risk involved.

G-Drive is the Knowledge associate with the operation of gravitic drives.

Grav (Grav Vehicle) is the Knowledge associated with the

operation of vehicles using gravitics technology.

Grav (Grav Watercraft) is the Knowledge associated with the operation of watercraft using gravitics technology.

Grav (Grav Flyer) is the Knowledge associated with the operation of flying craft using gravitics technology.

Gravitics is concerned with devices based on gravity control.

Gunner (Gunnery) is skill in the targeting, operation, and maintenance of the weaponry typically used by starships and spacecraft.

Heavy Wpns (Heavy Weapons) is skill in the targeting, operation, and maintenance of the Heavy Weapons.

Hibernate is the native ability to enter a long-term state of reduced consciousness and physical activity.

Hi-G (High-Gravity, Hi-Gravity) is skill in functioning in High-Gravity Environments.

History is the scientific study of events over time

Hostile Environ (Hostile Environment) is skill in functioning in environments which are hostile to life.

Hypno is the native ability to create altered mental states in which the subject's critical thinking faculties are bypassed or overridden.

Insight is the personal activity associated with analyzing available information to arrive at non-obvious conclusions.

Intuition is the native ability to generate or obtain information without any apparent operation of the senses.

J-Drive is the Knowledge associate with the operation of jump drives.

JOAT (JOT, Jack of all Trades) is skill in acting competently in many different undertakings.

Language is skill in communications between sophonts using a commonly accepted symbol set.

Launcher is the Knowledge associated with the targeting, operation, and maintenance of the military launcher weapons systems.

Leader (Leadership) is skill in expressing personal power to persuade or command others to perform specific tasks.

Legged is the Knowledge associated with the operation of vehicles supported by and propelled by legs.

Liaison is skill in informal coordination of relationships between different cultures or organizations.

Life Support is the Knowledge associate with the operation of life support systems.

Linguistics is the scientific study of languages

LTA (Lighter Than Air Craft) is the Knowledge associated with the operation of lighter-than-air craft.

Luck is the personal activity associated with selecting unobvious activities likely to produce success.

Magnetics is concerned with devices based on magnetism and magnetic fields.

Math is the native ability to perform detailed or extensive mathematical calculations rapidly and without external aids or devices.

M-Drive is the Knowledge associate with the operation of maneuver drives.

Mechanic (Mechanics, Mechanical) is concerned with devices based on mechanical interaction.

Medic (Medical) is skill in the healing arts.

MemAware is the native ability to recall in great detail previous experiences through the sense of Awareness.

Memorize is the native ability to recall in great detail previously acquired information.

MemPercep is the native ability to recall in great detail previous experiences through the sense of Perception.

MemScent is the native ability to recall in great detail previous experiences through the sense of Smell.

MemSight is the native ability to recall in great detail previous experiences through the sense of Vision.

MemSound is the native ability to recall in great detail previous experiences through the sense of Hearing.

Mole is the Knowledge associated with the operation of vehicles which burrough underground.

Morph is the native ability to change the shape, contours, appearance, and coloration of one's body.

Musician (Music) is ability in the auditory arts.

Naval Architect is skill in design of starships and spacecraft.

Navigation (Navigator) is skill in the determination of present location and course planning to a selected destination in a world surface setting.

Navy is the general Knowledge associated with the profession of spacer.

Ortillery is the Knowledge associated with the targeting, operation, and maintenance of the orbital bombardment systems.

Persuade is the interpersonal activity associated with influencing decisions.

Philosophy is the scientific study of the purpose or purposes of life

Photonics is concerned with devices and materials based on light, electromagnetic radiation, and photon flow.

Physics is the scientific study of fundamental laws of the universe

Pilot is skill in the maneuver of starships, spacecraft, and small craft.

Planetology is the scientific study of structure and characteristics of worlds

Planetology is the scientific study of structure and characteristics of worlds

Polymers is concerned with devices and materials based on plastics.

P-Plant is the Knowledge associate with the operation of fusion (and other) power generating plants.

Programmer is concerned with the operating and control systems of both analog and digital devices.

Psionicology is the scientific study of psionics and paranormal activity

Psychohistory is the scientific study of extremely large populations. Psychohistory is a predictive and manipulative science which envisions specific stimuli applied to a large population to achieve a specific result.

Psychology is the scientific study of mental processes and behavior

Query is the interpersonal activity associated with gathering information.

Rage is the native ability to enter a heightened emotional state characterized by insensitivity to pain and wounds, and increased physical characteristics.

Recon (Reconaissance) is skill in gathering information about military and naval operations and units.

Regina is the general Knowledge associated with the world of Regina.

Rider is the Knowledge associated with the use of animals as personal transport.

Robotics is the scientific study of the design, construction or creation, and maintenance of artificial beings

Rotor (Helicopter, Rotary Wing Aircraft) is the Knowledge associated with the operation of aircraft which use rotary wings.

Sapper (Combat Engineer) is skill in rapid construction or demolition under military conditions.

Scout Service is the general Knowledge associated with the profession of scout.

Screens is the Knowledge associate

with the operation of protective screens.

Seafarer is skill in the operation of watercraft.

Sensors is skill in the use of technological sensory equipment: the artificial devices which extend and enhance the natural senses.

Ship is the Knowledge associated with the operation of large surface watercraft.

Slug Throwers is the Knowledge associated with the use, maintenance, and repair of personal bullet-firing weapons.

Small Craft (Ship's Boat) is the Knowledge associate with the operation of spacecraft typically smaller than 100 tons.

Sophontology is the scientific study of intelligent beings

SoundMimic is the native ability to recreate or imitate sounds which the individual has previously heard.

Spacecraft ACS (Spaceship, Spacecraft) is the Knowledge associated with the piloting or direction of spacecraft in the ACS series (larger than Small Craft but smaller than 2500 tons).

Spacecraft BCS (Big Spaceship, Big Spacecraft, BCS Spacecraft) is the Knowledge associated with the piloting or direction of spacecraft in the ACS series (larger than 2400 tons).

Spines is the Knowledge associate with the operation of spinal weaponry for starships and spacecraft.

Sprays is the Knowledge associated with the use, maintenance, and repair of personal spray weapons.

Stealth is skill in moving or functioning without being detected.

Steward (Servant) is skill in meeting the personal needs of others.

Strategy is skill in formulating long-range or high level plans for business, military, or athletics.

Streetwise is skill in interacting with local subcultures.

Sub is the Knowledge associated with the operation of subsurface watercraft.

Survey (Exploration) is skill in the art of wilderness exploration and mapping.

Survival is skill in remaining alive in the face of dangerous situations or locations.

Tactics is skill in engaging and defeating an opponent in conflict situations.

Teacher (Instruction, Teaching) is skill in imparting knowledge to others in classroom or practical situations.

Teamster is the Knowledge associated with the use of animals as beasts of burden.

Tracked is the Knowledge associated with the operation of vehicles propelled by endless tracks.

Trader is skill in identifying goods and estimating their value in the local market.

Trainer (Training) is the Knowledge associated with changing behavior of animals (and of sophonts with C5 = Training).

Turret is the Knowledge associate with the operation of turret based weaponry.

Unarmed (Unarmed Combat, Melee) is the Knowledge associated with unarmed combat techniques.

Vacc Suit (Space Suit, Vacuum Suit) is skill in functioning in Vacuum environments, and using vacuum suits and environmental protective equipment.

Wheeled (Wheeled Vehicle) is the Knowledge associated with the operation of vehicles propelled by wheels

Wing (Fixed Wing Aircraft) is the Knowledge associated with the operation of fixed wing aircraft.

WMD (Weapons of Mass Destruction) is the Knowledge associated with the targeting, operation, and maintenance of the Weapons of Mass Destruction.

World is the general Knowledge associated with <World>.

Zero-G (Zero-Gravity) is skill in functioning in Zero-Gravity environments.

CRIMES

Crime is defined as the violation of law. Crime is classified or identified by type (or category), degree (or intensity), and intention.

THE CATEGORIES OF CRIME

Crimes can be assigned categories based on their nature and their severity.

		Crimes Against					
		Property	Environment	Sophonts	Society	Justice	Doctrine
Gaffe	1	Misuse	Litter	Offense	Disharmony	Mistake	Ignorance
Infraction	2	Vandalism	Waste	Insult	Violation	Inattention	Question
Misdemeanor	3	Damage	Damage	Assault	Slack	Inaction	Heterodoxy
Felony	4	Theft	Pollution	Mayhem	Dishonor	Perjury	Blasphemy
High Crime	5	Destruction	Ravage	Killing	Treason	Injustice	Heresy
Atrocity	6	Havoc	Ruin	Mass Killing	High Treason	Tyranny	Mass Deception

Within each category of crime, there is an ascending scale of seriousness. The least serious are gaffes (and typically not prosecuted): Slightly more serious are misdemeanors. Serious crimes are felonies.

Economic Degree. Crimes are further detailed by degree, the exponent of the economic value or cost of the crime: Violation-2 is a minor crime involving a value of about Cr100 (100 = 10^2 where the exponent is 2). Intentionally killing a businessman is Murder-6 (attributing to him a value of Cr1,000,000); killing a laborer is perhaps Murder-4. Assigning economic value to a crime is sometimes (often?) a subjective decision.

Cultural Values. Not all cultures believe that all of the instances on this list are crimes.

Intent. Intent is a strong component of crime; it affects the severity of consequences of committing a crime (in the general range: Ignorant. Uninformed. Passionate. Deliberate). An individual who specifically intends to commit a crime or to violate the law bears a greater degree of guilt than someone who commits a violation in the heat of passion or through inadvertence or negligence. Lack of intent may be argued as a defense. After conviction, lack of intent may be argued as a mitigating circumstance to reduce the severity of consequences.

Crimes Against Property

Misuse. Use of property inappropriate purposes.

Vandalism. Casual defacing of property.

Damage. Physical devaluation of property, but falling short of destruction.

Theft. Taking property Includes theft (taking by stealth) and robbery (taking by force), fraud (taking by deception).

Destruction. Physical destruction of property. Includes Arson, Bombing.

Havoc. Indiscriminant or mass destruction of property.

Crimes Against The Environment

Litter. Inattention to environment.

Waste. Misuse of resources. Includes failing to sort trash, failure to maintain equipment in efficient running order.

Contamination. Minor crimes against the environment. Includes littering, emitting obnoxious noises or odors, failure to dispose of useless property.

Pollution. Serious crimes against the environment. Includes disposal of untreated waste, unauthorized toxic waste production.

Ravage. Commercial actions which degrade the environment without regard for long-term consequences. Includes strip mining, clear cutting of forests, unaesthetic ice-harvesting.

Ruin. Non-commercial actions which degrade the environment. Includes setting forest fires. Use of weapons of mass destruction.

Crimes Against Sophonts

Beings may include intelligent beings, animals, artificial beings, artificial intelligences, and artificial entities such as corporations or companies.

Insult. Non-physical attacks against others. Violence or near-violence against beings, but which inflicts no injury. Includes threats, threatening actions, libel or slander.

Battery. Violence against beings which results in injury to the victim or others. Includes physical violence, emotional abuse; may include libel or slander.

Mayhem. Causing pain or suffering to a being. Includes cruelty to animals, torture.

Killing. Causing the death of an intelligent being. Includes murder and serial murder.

Mass Murder. Multiple killing of intelligent beings. Includes waging illegal war and crimes of aggression.

Crimes Against Society or the State

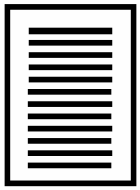
Violation. Disobedience of regulations. Includes traffic or curfew violations, failures of permits or paperwork.

Slack. Undue dependence on society or the state. Includes welfare or unemployment assistance abuse.

Dishonor. Betrayal of the basic principles of society.

Treason. Adherence to the principles of an alternate or competing society. In religious cultures, this might be heresy.

High Treason. Active support of the principles of a competing society to the detriment of the individual's native or adopted society.



The Literature

Traveller is science-fiction, and it is based on science-fiction: the concepts of SF literature thread their way through every part of **Traveller**. Sometimes, when it isn't possible to play **Traveller**, science-fiction novels and stories are the next best thing.

This reading list covers many well-known and not-so-well-known science fiction concepts. Some of the concepts are already in the rules: easy to implement when the opportunity arises. Others are inspirations for adventures, challenges, or intrigues just waiting to be turned into Traveller adventures.

Aldiss, Brian, editor, Collection, Space Opera.
Aldiss, Brian, editor, Collection, Galactic Empires Volume One.
Aldiss, Brian, editor, Collection, Galactic Empires Volume Two.
Anderson, Poul, Novel, The Man Who Counts.
Anderson, Poul, Novel, Hiding Place.
Anderson, Poul, Series, the Dominic Flandry novels (1951-1993).
Anvil, Christopher, Collection, Interstellar Patrol.
Anvil, Christopher, Novel, Pandora's Legions.
Asimov, Isaac, Series, Robot Series.
Asimov, Isaac, Novel, The Currents of Space.
Asimov, Isaac, Novel, Pebble in the Sky.
Bailey, Barrington J, Novel, Star Winds.
Bailey, Barrington J, Novel, Star Virus.
Barnes Arthur K, Novel, Interplanetary Hunter.
Bates, Leslie, Novel, Friends in High Places.
Bates, Leslie, Short Story, Homecoming.
Blish, James, Collection, The Seedling Stars.
Brin, David, Series, Uplift.
Brunette, Paul, Novel, The Death of Wisdom.
Brunette, Paul, Novel, To Dream of Chaos.
Brunette, Paul, unpublished, The Backwards Mask.
Carson, Matthew, Novel, The Backwards Mask.
Clark, Arthur C, Short Story, The Ultimate Melody.
de Camp, L Sprague, Series, Krishna.
Del Rey, Lester, Short Story, Instinct.
Dougherty, Martin J., Novel, Diaspora Phoenix.
Dozois, Gardner, editor, Collection, The New Space Opera.
Drake, David, Novel, Hammer's Slammers.
Godwin, Tom, Short Story, "The Cold Equations".
Hamilton, Edmond, Novel, Exile.
Hartwell, David G, editor, Collection, The Space Opera Renaissance.
Heinlein, Robert A, Novel, Space Cadet.
Heinlein, Robert A, Novel, Red Planet.
Heinlein, Robert A, Novel, Farmer In The Sky.
Heinlein, Robert A, Novel, The Puppet Masters.
Heinlein, Robert A, Novel, Starman Jones.
Heinlein, Robert A, Novel, Tunnel In The Sky.
Heinlein, Robert A, Novel, Citizen of the Galaxy.
Heinlein, Robert A, Novel, Starship Troopers.
Heinlein, Robert A, Short Story, Life-Line.
Heinlein, Robert A, Novel, Time for the Stars.
Heinlein, Robert A, Novel, The Star Beast.
Heinlein, Robert A, Novel, The Rolling Stones.
Heinlein, Robert A, Novel, Between Planets.
Heinlein, Robert A, Novel, Podkayne of Mars.
Knight, Damon, Short Story, The Country of the Kind.
Laumer, Keith, Series, Bolo Series.
Laumer, Keith, Series, Retief Series.
Leinster, Murray, Short Story, Plague.
Leinster, Murray, Collection, Colonial Survey, Gnome Press, 1957.
Leinster, Murray, Collection, The Med Series, Ace, May 1983.
Leinster, Murray, Collection, Med Ship, edited by Eric Flint and Guy Gordon, Baen, June 2002.
MacApp, C C, Novel, Prisoners of the Sky.
MacApp, C C, Novel, Secret of the Sunless World.
MacApp, C C, Novel, Recall Not Earth.
McCullom, Michael, Novel, Life Probe.
Niven, Larry, Series, Ringworld.
Niven, Larry, Novel, The Mote In God's Eye.
Niven, Larry, Novel, The Gripping Hand.
Niven, Larry, Series, The Man-Kzin Wars anthologies based on the Known Space novels by Larry Niven.
Norton, Andre, Novel, The Stars Are Ours!.
Norton, Andre, Novel, Galactic Derelict.
Norton, Andre, Novel, Star Rangers.
Nourse, Alan E, Short Story, Brightside Crossing.
Piper, H Beam, Novel, The Cosmic Computer.
Piper, H Beam, Novel, Space Viking.
Pohl, Frederick, Series, Heechee.
Rowley, Christopher, Novel, Starhammer.
Rowley, Christopher, Novel, Vang: The Military Form.
Rowley, Christopher, Novel, Vang: The Battlemaster.
Russell, Eric Frank, Novel, Wasp.
Saberhagen, Fred, Series, Berserkers.
Schmitz, James, Novel, The Witches of Karres.
Sheckley, Robert, Short Story, Zirn Left Unguarded, the Jenghik Palace in Flames, Jon Westerly Dead.
Simak, Clifford, Short Story, Desertion.
Smith, Cordwainer, Collection, The Rediscovery of Man: The Complete Short Science Fiction of Cordwainer Smith.
Smith, E E "Doc", Series, Lensman.
Swanwick, Michael, Novel, Vacuum Flowers.
Swycaffer, Jefferson, Series, Traveller Novels.

Swycaffer, Jefferson, Novel, Not In Our Stars, Avon Books, New York, USA, 1986..

Swycaffer, Jefferson, Novel, Become the Hunted, Avon Books, New York, USA, 19nn..

Swycaffer, Jefferson, Novel, The Universal Prey, Avon Books, New York, USA, 19nn..

Swycaffer, Jefferson, Novel, The Praesidium of Archive, Avon Books, New York, USA, 19nn..

Swycaffer, Jefferson, Novel, Tales of the Concordat 1: The Empire's Legacy.

Swycaffer, Jefferson, Novel, Tales of the Concordat 2:.

Swycaffer, Jefferson, Novel, Tales of the Concordat 3: .

Tubb, E C, Series, Dumarest Series.

Van Vogt, A E, Novel, Slan.

Van Vogt, A E, Novel, The Weapon Shops of Isher.

Vance, Jack, Series, Demon Princes series.

Vance, Jack, Series, Tschai.

Varley, John, Novella, The Persistence of Vision.

Viehl, S L, Series, Stardoc (series).

Vinge, Vernor, Novel, A Fire Upon The Deep.

Vinge, Vernor, Novel, A Deepness In The Sky.

Vinge, Vernor, Novel, The Witling.

Webber, David, Series, Honor Harrington.

Wells, H G, Short Story, When the Sleeper Wakes.

White, Steve, Novel, Prince of Sunset.

White, Steve, Novel, Emperor of Dawn.

Williams, Walter Jon, Series, Drake Maijstral Series.

Williams, Walter Jon, Series, Dread Empire's Fall.

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T5 Font Symbols -1

T5-9000 Symbols.ttf

T5 Symbol -1

1	2	3	4	5	6	7	8	9	0	- *	=
One	Two	Three	Four	Five	Six	Seven	Eight	Nine	Zero		
1	2	3	4	5	6	7	8	9	0		
											
Classic Traveller	Mega Traveller	The New Era	T4	T5	EOTE	T20	T8	GURPS Traveller	Ziru Sirka		

Q*	W*	E*	R*	T	Y	U*	I	O	P	[	]
											Flaming Eye
											
											
IISS Scouts											Jolly Roger

A	S	D*	F	G*	H*	J	K*	L	:	|
Rad	Bio	Poison	Corrode	Electric	Magnetic	EMP	Flash	Burn	Psi	Logo for Traveller5
										
											
Hot	Cold	Gas	Stench		Frag	Blast	Bullet	Grav	Cut	

Z*	X	C	V*	B	N	M*	<	>	?	~
Solo	Gender Two	Gender Three	Gender Four	Gender Five	Gender Siz	Gender Alt One	Gender Alt Two	Gender Alt Three	Strange	Logo
										
											
Female	Male	Neuter	Egg Donor	Activator	Bearer	Gender Alt Four	Gender Alt Five	Gender Alt Six	Bizarre		

Upper row is CAPS. Lower row is lower case.

*** Overwrites.** Zero-width font characters. Type this character followed by a non-zero-width character (typically F, f, J, or j).

T5 Font Symbols -2

T5-9000 Spacecraft Wing Symbols.ttf

T5 Symbol -2

1	2	3	4	5	6	7	8	9	0	- *	=
One	Two	Three	Four	Five	Six	Seven	Eight	Nine	Zero	Terran Confed	TROM
Classic Traveller	Mega Traveller	The New Era	T4	T5	EOTE	T20	T8	GURPS Traveller	Ziru Sirka		

Q*	W*	E*	R*	T	Y	U*	I	O	P	[	]
											Flaming Eye
IISS Scouts	4518th Lift Rgt		Imperial Navy	Quarantin	Norris	Darrian	Sword Worlds				Jolly Roger

A	S	D*	F	G*	H*	J	K*	L	:	|
										Logo for Traveller5

Z*	X	C	V*	B	N	M*	<	>	?	~
Zhodani	Aslan	Vargr	Vilani	Droyne		Solomani				Logo
Naasirka	Zirunkariish	Makhid			Imperial Lines		LSP			

Upper row is CAPS. Lower row is lower case.

*** Overwrites.** Zero-width font characters. Type this character followed by a non-zero-width character (typically F, f, J, or j).

T5 Symbols-3

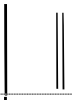
T5-9000 Spacecraft Deck Symbols.ttf

T5 Symbol -3

1	2	3	4	5	6	7	8	9	0	- *	=
Canard	Triangle	Delta-1	Delta-2	Sweep-1	Sweep-2	Sweep-3	Round	Dranac	Square	Side Drive	Round Nose
											
											
Canard	Triangle	Delta-1	Delta-2	Sweep-1	Sweep-2	Sweep-3	Round	Dranac	Square	Side Drive	Ogive Nose

Q*	W*	E*	R*	T	Y	U*	I	O	P	[	]
Dual Pilot	Crew Couches	Coach 4	Top Panel	Base	Extender	Top Iris	Cap	L Bunk	R Bunk	Life Support	Turret
											
											
One Pilot	Crew Couch	Coach 2	Top Bulkhead	Base Widener	Extender Widener	Top Sliding	Cap Widener	L Bunk	R Bunk	Fuel	Turret

A	S	D*	F	G*	H*	J	K*	L	:	|
Turret Extended	Turret Starboard	Left Panel	Labelled Square	Right Panel	Left Valve	Notched Square	Right Valve	Fin	Drive Fin	Logo for Traveller5
										
											
Turret Extended	Turret Port	Left Bulkhead	Blank Square	Right Bulkhead	Left Slider	Dashed Square	Right Slider	Fin	Drive Fin	Missiles

Z*	X	C	V*	B	N	M*	<	>	?	~
Visor	Curve Extender	Nose Widener	Bottom Panel	Base	Extender	Bottom Iris	Cap	Square Fin	Square Fin	IMTU
										
											
Visor	Curve Extender	Nose Turret	Bottom Panel	Base	Extender	Bottom Slider	Cap	Minimum Drive	Square	Logo

Upper row is CAPS. Lower row is lower case.

*** Overwrites.** Zero-width font characters. Type this character followed by a non-zero-width character (typically F, f, J, or j).

T5 Symbols-4

T5-9000 World Mapping.ttf

1	2	3	4	5	6	7	8	9	0	- *	=
x	x	x	x	X							
x	x	x	x	X							

Q*	W*	E*	R*	T	Y	U*	I	O	P	[	]
x	x	x	x	x	x	x	X				
x	x	x	x	x	x	x					

A	S	D*	F	G*	H*	J	K*	L	:	|
										Logo for Traveller5
										1000 km

Z*	X	C	V*	B	N	M*	<	>	?	~
										Logo
		1000 km								
										IMTU

Upper row is CAPS. Lower row is lower case.

*** Overwrites.** Zero-width font characters. Type this character followed by a non-zero-width character (typically F, f, J, or j).

T5 Symbols-5

T5-9000 Vilani Headline Master.ttf

T5 Symbol -5

1	2	3	4	5	6	7	8	9	0	- *	=
x	x	x	x	X							
											
											
x	x	x	x	X							

Q*	W*	E*	R*	T	Y	U*	I	O	P	[	]
x	x	E	Ruun	Tat	x	U	X	O	Pap		
											
											
x	x	x	x	x	x	x					

A	S	D*	F	G*	H*	J	K*	L	:	|
A	Sur	Da		Gali			Karun	La		Logo for Traveller5
										
										

Z*	X	C	V*	B	N	M*	<	>	?	~
Zalaa		Chen	Von	Bi	Ni	Muu				Aan
										
										

Upper row is CAPS. Lower row is lower case.

*** Overwrites.** Zero-width font characters. Type this character followed by a non-zero-width character (typically F, f, J, or j).