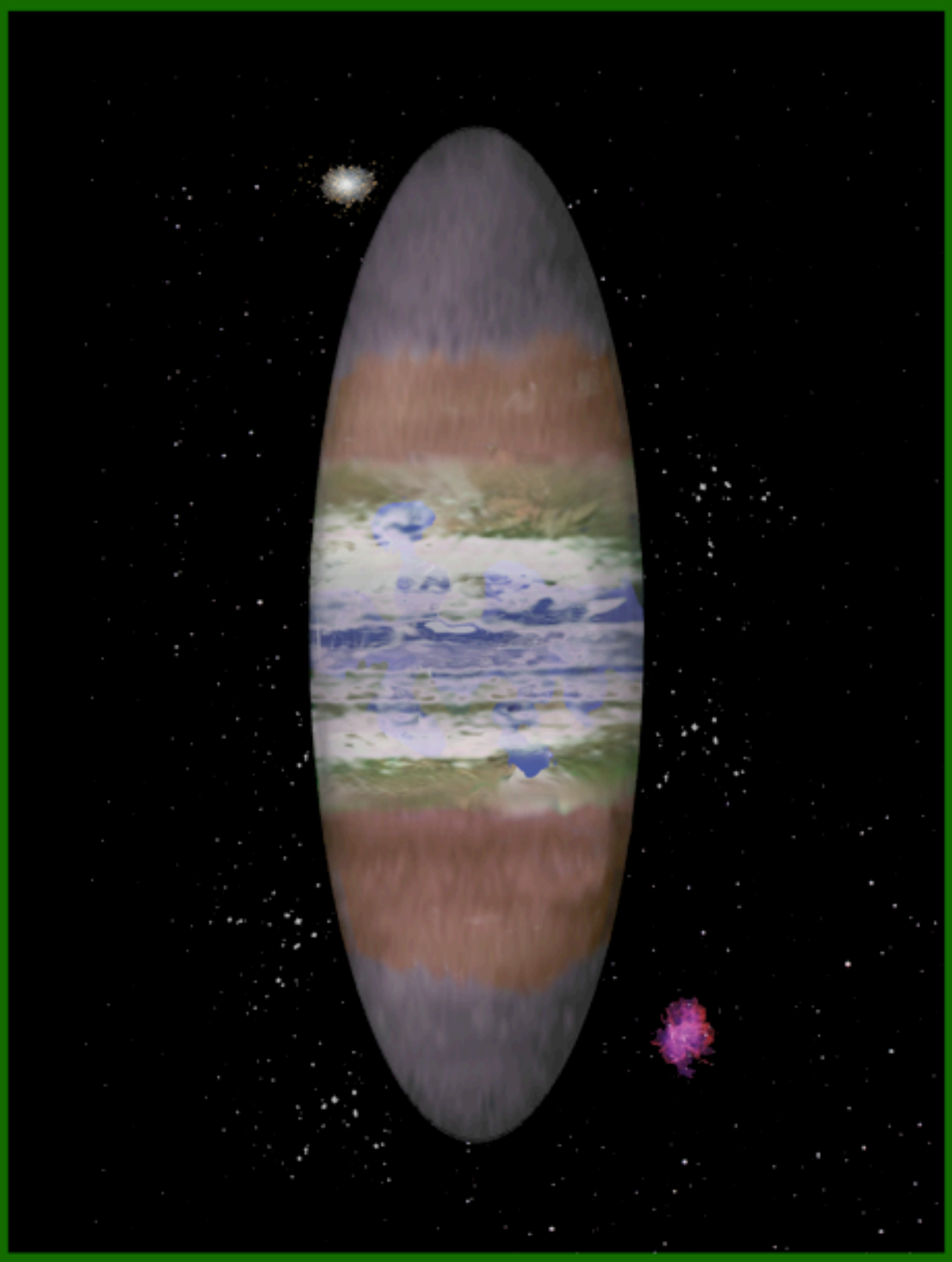
The Artifact
Player's Handbook



Second Edition

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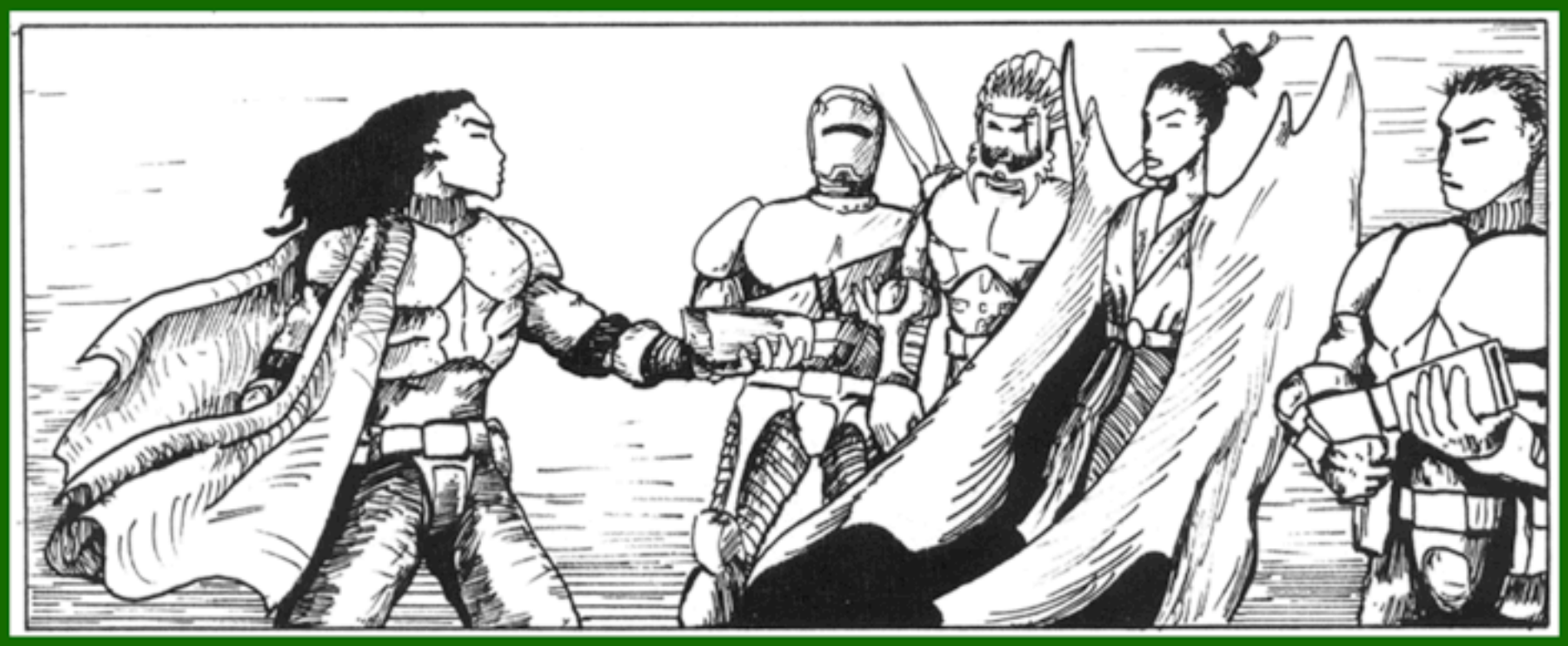

Sourcebook One

This is the second edition of the bigger and better Player's Handbook, an indespensible guide to The Artifact. Twenty Eight pages brings the people and world of The Artifact to life with detailed descriptions from an ASO Field Scientist's perspective. Native technologies are explained allowing players to know what they're touching and using. Twenty more pages detail the job of a Communications Officer and give stats and rules for hacking into computers and vehicles including implanting viruses. The remaining fifty pages are a toybox for the Players packed tighly full of equipment and vehicles.

- Survival gear
- High power science gear
- Demlition supplies
- Non-lethal weapons

Learn to speak basic Scimrahn!

Grunt a few Kelrath words!

How not to embarrass yourself at a Kelrath party!

The Artifact Player's Handbook

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A Note: This book is designed as a game, in no way are the aliens, monsters, powers, places, and/or governments real. This book does not in any way reflect the author's or company's attitudes or beliefs. If you find any material in any way offensive we give you our sincere apologies. The game enclosed is designed to be fun, and a fantasy version of things in the future.

Dedicated To: **Cody for putting up with my crack pot rants.**

Player's Handbook

This Player's Handbook is an introductory guide to The Artifact. It is told from the viewpoint of an ASO field scientist Evan Larrs, giving a report to the ASO training branch. There is a lot of general information contained in this book from the viewpoint of a character within the game. There are no stats, and no specific mention of equipment. Players can look to the Equipment section of The Artifact game book. This handbook is designed to let the players know a lot of general information about The Artifact and its inhabitants. (Players also include the Game Master in this instance.) This is done to encourage role play. Some of the information in this book is conjecture on the part of Officer Larrs, and may be substantiated or contradicted at a later time, but for the most part this volume can be considered authoritative.

A Report By Evan Larrs

Hello, my name is Evan Larrs. I signed up for The Artifact project in 2078 and in 2079 I was accepted for the project. I am a field scientist for the Artifact Study Organization (ASO) at the time of this initial writing it is 2086 and these are my findings for my first ten months on the Artifact. I apologize for the occasional sparseness of my documentation. My notes were recovered from my P.D.A. (personal data apparatus) by an alien thinking machine after it was melted by plasma fire. My estimate was that 36% of the information was unrecoverable. (My backups were destroyed six days before by water damage.)

The Artifact Itself

When I first arrived on the Artifact I was astounded by it's immensity. Try as I might, I can find that no words can prepare you for the vast expanses. Perhaps 17th century sailors would have some sense of how it is to travel for months and see a soul or not have any obvious marker that you had gotten anywhere. In my records I found some initial calculations of volume.

Total Volume
309,510,000,000,000 km^3

Core Volume 93,591,200,000,000 km^3

Polar Volume
215,919,000,000,000 km^3

Number of Hexes (Grier) 1,500,210,000,000

Number of incremental cities
24,593,616,868

Artifact Potential Population
7,082,960,000,000,000,000 or 7.0E18

Plasma Conduits 4068

95% of the current population lives in close proximity to a plasma conduit in .0002% of the habitable area

The above are just rough calculations, but they do serve one useful purpose. They convey that even when presented with aspects of the Artifact it is difficult to grasp. Even when I see these figures, my mind can scarcely comprehend their enormity. Another statistic that has been difficult to swallow is that at one time, there may have been over nine Trillion inhabitants of The Artifact at one time several thousand years ago.

The Artifact is very different from Earth, more so than it would at first seem. Hexes are at the same time like being inside a structure, and like being outdoors. A single hex is beyond the engineering capabilities of earth builders. This all seems academic until one is forced to contend with them. The structures in the Artifact shape the societies that live in them. People have to adjust to the structures around them. There is no real weather, no day or night. Because radio is only good for short range communication (10km or less), and wire based communication is expensive to implement, messengers are vital to communications. Radar is also a short range (10km) detection system, so other systems are needed. It is so difficult to explore the vast number of hexes that a majority of The Artifact may have never been seen. For all that we know there could be the equvelent to the discovery of America lying in the interior somewhere.

Darkness is ever present underground, with islands of powered areas that sponser life. Plasma power that gives light, heat, and water is the life blood of The Artifact. Without it the hexes inside die and cannot support life as we "Earthers" are accustomed to. I will go into this later but for now it is suffice to say that just as we Earthers look to our Sun for life, the residents of The Artifact look to the super heated plasma gas that distributes power to bowels of The Artifact's interior.

The Industry Hexes are readily available factories able to produce nearly any machine. This has caused a proliferation of manufactured goods, with very few skilled laborers.
Energy is widely available in the form of plasma energy, this cheap availability of power makes for unusual opportunities. Scientists can study high energy physics applications that would blackout a city on earth. It has made the inhabitants of The Artifact numb to the resources they wield on a daily basis.

Technology

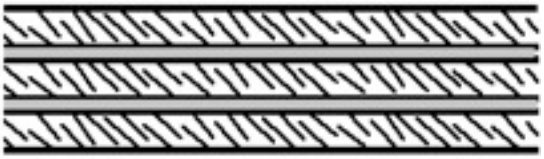
As amazing as the technology on The Artifact may seem, there are only a few areas that the inhabitants are truly advanced in. The majority of the advanced technology that the inhabitants use, are found within The Artifact itself. Plasma weapons and tools are an imitation of the technology in the plasma conduits. Many material technologies such as CCC (Carbon Ceramic Composite) are the building materials of The Artifact. In addition, many of the mechanical systems in vehicles such as E-suits can be found in Hosent.

Several true advancements that are not found "naturally" within The Artifact are none the less impressive. Energy storage is one such field. For the most part, high power laser technology is dependent on the ability to store large amounts of energy. The Scimrahn and Kelrath use a conductive carbon polymer to make their high energy batteries and the Chezbah use a lithium ion formula that is extremely advanced.

Other advancements are evident, such as the liquid quantum computers used in most computer technologies on The Artifact. Below is a detailed discussion of several of these technologies.

CCC

Carbon ceramic composite (or CCC) is a substance that looks like stone but acts like a cross between hard plastic and metal. For it's strength it is very light having a tensile strength only slightly lower than steel. CCC is one of the most common materials in The Artifact. It is the primary construction material The Artifact is composed of. It is used by the inhabitants in most of the places that people from earth would use metal or plastic. (There is very little metal on The Artifact, and no fossil fuels to make plastic from, although The Artifact's inhabitants have made plastics from raw carbon.) It is constructed from thin layers of carbon and a ceramic adhesive. The thickness of these layers vary with their application. The CCC in Hex (or Grier) walls is a very low grade and the carbon layers are sometimes up to half a centimeter thick. This makes the walls more ridged and brittle. CCC used in every day items such as tools is a medium grade and the carbon layers are often in the range of four to five hundred microns thick. High grade CCC is used in vehicle armor and engine components and uses a higher grade ceramic bonding agent. The ceramic layer is often only ten to twenty microns thick.



The carbon layers of CCC is manufactured in individual paper thin sheets and then laminated (or "glued") together by an even thinner layer of ceramic bonding agent. The carbon layers are made of microscopic carbon tubes (essentially rolled up graphite) that intertwine and hook together to form a flexible sheet. Similar carbon tubes were discovered in a laboratory environment on Earth in the late twentieth century. These tubes are very difficult to manufacture and manipulate on any useful scale. The tubes are so small that billions of them would hardly be the size of the period at the end of this sentence. The most amazing part of making CCC is getting the microscopic tubes to connect together on a large scale. This is accomplished through a chemical soaking that unbinds the tubes allowing them to be spread like a paste. The paste is then baked in ovens. The fast drying process causes the tubes to again, curl around each other and become a solid sheet.

HDCCC (High Density Carbon Ceramic Composite pronounced "H, D, triple C") is manufactured using a slower manufacturing process and complex drying ovens that are difficult to maintain. This makes HDCCC a much stronger and a higher quality. However it is also very scarce.

When the inhabitants of The Artifact make CCC they break down already existing CCC such as Hex walls. They don't have to make the carbon tubes that makes up CCC. Whoever first made The Artifact could not have had the enormous quantity of these tubes required to build The Artifact available to them. These raw materials must have been created by someone. How this was accomplished is a question that is still unanswered.

The carbon layer of CCC is a good conductor of electricity and heat. If the carbon tubes were to be aligned, CCC would have nearly no resistance to the passage of heat and electricity. However the random alignment of the tubes does cause some resistance.

The ceramic layer of CCC however can either serve as an insulator to heat and electricity, or can be engineered to be a limited conductor of heat, electricity, or both.

An interesting upshot of this is that computerized vehicle or tool can be given a limited sense of touch. A mild electrical field is passed through the carbon layers of CCC. When an object touches the outer hull, a small current is drawn. The computer detects this and registers that the hull is touching something. If a significant amount of pressure is applied to the hull, the pressure alters the resistance of the CCC and the computer can tell how much pressure is being applied by the number of layers that are affected. Likewise, damage to the hull also alters it's electrical properties and is sensed as an artificial pain.

Another application of this is that computers can communicate by touching the hulls of two vehicles together and sending data over their "skin". This allows for quiet communication between vehicles. This feature is included mostly in military vehicles.

LCF

Liquid Carbon Fuel (or LCF) is another carbon based material used by the inhabitants of The Artifact. There are no fossil fuels in The Artifact, so for millennia, methane from the methane wastes, and plasma was used for fuel. However methane is difficult to transport to everyone on The Artifact and Plasma is difficult to store.

Invented nearly two thousand years ago by an unknown Kelrath scientist, LCF is a carbon polymer. This polymer has many times the explosive force of petroleum based fuels used on Earth. It has nearly as much explosive power as some solid rocket fuels.

Energy Storage

One of the few places plastics are used by The Artifact's inhabitants is in manufacture of batteries. Conductive plastics form a cathode of the battery, and a semi-conductive layer becomes the anode. A third insulator layer isolates the poles and allows each cell to be given a high voltage charge. Because of this, these batteries act like conventional batteries, but also behave like capacitors. These high voltage states allow the battery to hold a much higher level of power.

Quantum Liquid Computers

Quantum Liquid Computers use photon energy in a liquid sodium media to store and calculate information. Although computers using a similar processors became more common on earth after transistor grade silicon supplies began to become scarce (in 2040), Liquid Quantum Computers have hundreds of times the quibits (Quantum Bits) than those built on earth.

Laser Technology

There are several methods of making a more powerful laser. Dumping power into the generating media is perhaps the oldest method and probably the least efficient. Packing more photons into a beam increases the energy, but requires a larger emission media, or a large battery of media. This is usually more efficient, but the process has it's limits. High frequency lasers carry a more powerful punch than low frequency lasers. However they require more energy to generate a beam. (after all, energy is energy, it's just how efficiently you can convert electric power into photons.) All of this said, the main goal is to have the power put in to a laser be roughly equal to the power that comes out as a laser. Of course the devil is in the details, it's easy to

say you want 100% efficiency, and another to achieve it.

The most efficient laser inhabitants of The Artifact (namely the Chezbah) have devised is a gamma ray laser. However this laser is so prohibitively expensive to build it has only been installed on the Chezbah's orbital defense systems.

The most widely used laser is an violet/ultraviolet laser that is still very efficient in contrast to Earth technology.

Plasma Technology

Most of the advanced plasma management seen in many of the everyday items on The Artifact is either identical to or only slightly modified from the plasma distribution system on The Artifact. From that fact we know that there has been little or no advancement since The Artifact's creation. It seems odd that over thousands of years, this technology has remained so stagnant.

Plasma is in essence superheated gas, well into the tens of thousands of degrees. The molecules become so excited that they shed off their electrons and take on a positive electrical charge. The problem with plasma is that it is difficult to contain. If it touches it's physical container the container melts or the plasma cools and looses energy. Plasma must be kept in a vacuum and away from the walls of it's container. One natural advantage to containing plasma is it's electrical charge. Because of it's charge plasma reacts with a magnetic field. It also creates it's own "magnetic bottle", a magnetic containment field. However plasma is notoriously "slippery", in other words it can seep out of its magnetic bottle. However, whoever constructed The Artifact developed a method of compressing tesla, or lines of magnetic force. This naturally happens in iron and other ferrous materials but is difficult to achieve in air (or a vacuum). This process is still under study. All of that said, one might ask how does a plasma weapon work? The system works something like this. A mild negative electrical charge is passed through the air before the weapon is discharged. Then a condensed magnetic field forces the negatively charged air out of the way. Then a column of plasma is accelerated down the magnetic path. One upside of this method is that the plasma can be accelerated all the way down the path to it's target by the magnetic field giving the weapons a relatively long range. Of course once the negatively charged air is pushed out of the way, electrically neutral air tries to rush in to fill the void. As a result the plasma has only a second of time to travel to it's target.

Force Fields

Force fields are high energy devices that make use of powerful magnetic fields and a cascade of ions to form a temporary curtain to protect anything inside the force field. These devices employ similar technologies as plasma weapons. Tesla compression, as used in plasma storage, allows more precise ion flow control and density. The emitter launches ions into the magnetic field at high velocity and because they are electrically charged, they follow the path of the magnetic field. The ion generator must either use the surrounding air (if there is any) to replenish ions, or preferably reclaim them as they curve back along the magnetic field.

As matter or energy enter the field, they are bombarded by the stream of ions. Plasmas diffuse and dissipate under this barrage. Photons in lasers are diffused or absorbed and become harmless light. Solid object such as bullets are deflected and a majority of their energy is absorbed. Standing too close to a force field is a hair raising experience (literally). The electrical charge of the ions partially discharges in the air and causes a (surprisingly) mild charge in the local atmosphere, making hair stand on end and causes mild shocks.

Anti-Gravity

Anti-Gravity systems vary in different applications. Some systems only produce lift, some are used in lift and propulsion. Many Scimrahn systems are very simple. As a result they are often not very efficient or fast. However some systems are so reliable, they rarely need any type of maintenance. This is because most use magnetic fields and near vacuums to eliminate friction. A cone shaped super conductor cooled to approximately -120 C is suspended by magnetic coils. The field fluctuates to cause the superconductor to spin. Once the electro magnet reaches one hundred thousand RPM the engine has reached it's optimal lifting capacity. Despite their relative common nature, Anti-grav engines are expensive to build because of exacting material fabrication. The superconducting

cone, (also referred to as a core) is an application of nanotechnology. The material that makes up the core is a precisely aligned crystal of carbon, boron, and sodium.

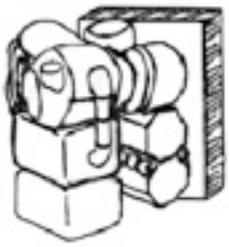
E-suits

E-suits as a technology is a diverse topic. Essentially the root idea behind the E-Suit is traveling in harsh conditions. However, most designs are military in nature. Each nation has their own strategy to designing E-suits. Scimrahn suits are simple systems and the chassis is designed for easy modifications and repair. Kelrath suits tend to be well armed and heavily armored. Chezbah E-suits are designed to be light, compact, fast and maneuverable. E-suits are mainly hydraulic mechanisms supplying a majority of the system's movement.

Scimrahn and Kelrath suits achieve hydraulic power from internal combustion engines.

Chezbah suits use electromagnetic rails that form a linear motor. Their more rugged construction vehicles use a sonic piston to create hydraulic pressure.

Fine motor skills use a metal and a polymer basket weave tube that contract when and electrical current is passed through them. These "muscles" allow for quick reflexes that would be impossible in hydraulic systems.



A TF-2394 engine assembly and protective firewall

The most impressive feature of the E-suit is it's complex and elegant control system. In the TF-2394 two terrain computers, one in each leg, study sensor data and determine how to maintain balance. The main computer determine how to proceed according to the pilot's commands. The controlling computer uses multiple inputs including manual controls and voice command. The systems can adjust on the fly as to what inputs are being used. One moment the manual controls are used to target, the next moment, the pilot can bark out firing co-ordinates. The system's flexibility it's primary strength.

Subterranean Weather

One of the ways that the subterranean habitat affects the people in it is weather or lack of it. Underground is a relatively static atmosphere. It is most often very cold in many areas underground. Those arias without power can often have temperatures that drop below freezing. These freezing temperatures can cause water supply pipes to burst, causing ice to form. In some instances reservoirs have cracked open flooding an aria then freezing again, and coating large expanses in ice. On the flip side of the coin, regions near plasma conduits can reach temperatures over forty five degrees Celsius. This causes a large majority of the population to reside in close proximity to plasma conduits.

One way that wind is generated in the underground is by large expanses of White Spoor creating electrical discharges. A highly active colony can warm the air near them, electrical discharges super heat local air and vortexes of cold air rush in, then as the air cools air rushes out. In this way spoor colonies "breath" (or "romosh" in Scimrahn). This suction can at select points become so violent and gust so suddenly, the wind speed can exceed four hundred kilometers per hour. In this way, travelers have been known to be sucked into areas of spoor.

Psudo-weather

The air filtration system of incremental cities, when powered, often create a gentle breeze. However these systems can sometimes gusts of twenty kilometers per hour, more than enough to kick up some dust.

Water cycling through the filtration system can cause a slow steady rain from hex ceilings as the water pipes drip, but this is often not hex (grier) wide. However, powered hexes have rain systems in agricultural arias that will rain in a measured amount once a day in a twenty two hour cycle. Even this rain is often light, unless there is damage to the rain system.

Surface Weather

I have been to the surface only once, and I was lucky enough to see the vegetation bands. When I first read of the vegetation bands, images of tropical rain forests were what came to mind. The area of the bands that I saw bore no resemblance to a rain forest, but rather rolling fields of orchards and rows on rows of giant fern. These farms had no large trees, and structures are built into hillsides or underground. The reason why is the weather. In the heavy and rather uncomfortable atmosphere in these regions, massive

typhoons build up and carry much greater force than those on earth. These typhoons travel well inland and lay waste to giant swaths of countryside. Because of the flooding rains however, is the main reason for the vegetation band's lush growth.

Conversely, I would expect that the further out one travels from the bands, and the thinner the atmosphere gets, the less atmosphere plays a role. Although I have heard of "ground lightning" out in the extreme fringes of the atmosphere , where wind friction builds up a static charge and a bolt of lightning races along the ground only to be absorbed by the air.

Biology

I include this information here because it proved invaluable to me and my troop when it came to food and medicine. Many of the Scimrahn are well versed in much of the native fauna and flora. This is not surprising, as this is native to them and they must rely on whatever foodstuffs they can gather. Much of the life is well documented by other biologists so I have not gone into great detail here. Rather it is my aim to document simple survival information that I wish we had when we arrived on the Artifact.

Scimrahn Diet

In the Scimrahn tribes I was exposed to, the following outlines the typical Scimrahn diet, and a small excerpt about each food in order of frequency. My guide to Scimrahn cuisine was a very heavily built man named Mawlk. Mawlk is a Scimrahn gatherer for a carrier tribe. He and several others would strike out every day, and forage for whatever food was available. Gathering reduces the amount of food the tribe has to carry and provides fresh food. Mawlk specialized in harvesting nuts from trees and catching Bah-bahreeth, so I received an up close look at the methods involved in each.

Zah: Although I was never much into eating insects, living with the Scimrahn soon makes it a necessity. Zah comprise a majority of the Scimrahn's protein intake. Surprisingly, Zah aren't all that different from eating shrimp, aside from having a mild nutty flavor.

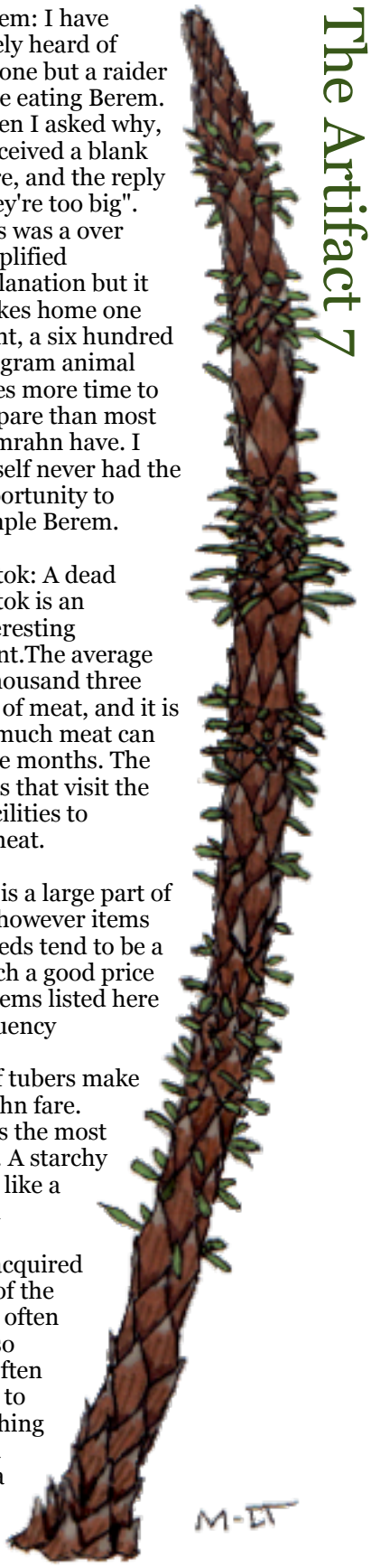
Seeter: While the Seeter is the largest animal found in any numbers underground, the nutrition value of a scavenger isn't the best. Although it is a welcome change from Zah. Seeter is stringy and gamy, but it is meat and has a good fat content surprisingly. It all just breaks down to, Seeters are very good scavengers, and Seeter meat is better that no meat. I've been told that Seeter tastes like Duck, but I wouldn't know, I never had duck.

Kaydoo: Kaydoos are often serve a double duty, they carry your food for a few weeks and if you haven't gotten there yet, you eat the Kaydoo. Kaydoo isn't any less gamy than a Seeter, but being a herbivore, I'd imagine they're a lot more nutritious. Kaydoo meat tastes like low grade beef, not a lot of flavor and very tough.

Bah-bahreeth: Bah-bahreeth are rather difficult to catch, as a result they are a bit of a delicacy. To cut to the chase, they're my favorite choice and Mawlk who was quite adept at catching them was also good at preparing them.

Bah-bahreeth I feel foolish saying it, tastes like chicken. Bah-bahreeth are found most often in thermosynthetic biospheres, their favorite food are the Ekchok that feed off Zah, and Nicoe. While the Bah-bahreeth are for the most part harmless, their quarry, the Ekchok are not. In order to find Bah-bahreeth you have to find Ekchok. One method of catching Bah-bahreeth is to catch an Ekchok and use it as bait. Mawlk preferred to mimic the sounds of an Ekchok to lure the Bah-bahreeth. This can also however bring in more Ekchok.

Berem: I have rarely heard of anyone but a raider tribe eating Berem. When I asked why, I received a blank stare, and the reply "they're too big". This was a over simplified explanation but it strikes home one point, a six hundred kilogram animal takes more time to prepare than most Scimrahn have. I myself never had the opportunity to sample Berem.



Pettok: A dead Pettok is an interesting event.The average Pettok yields one thousand three hundred kilograms of meat, and it is a lot of meat. That much meat can feed a tribe for three months. The trouble is, few tribes that visit the surface have the facilities to preserve so much meat.

Vegetation is a large part of the Scimrahn diet, however items such as nuts and seeds tend to be a bit rare and can fetch a good price in the Poord. The items listed here are in order of frequency

Tubers: A variety of tubers make up a bulk of Scimrahn fare. Shek-mog-leech is the most common of these. A starchy pod tasting much like a potato, but with a sourness that is something of an acquired taste. The leaves of the "shek-mo" as it is often referred to are also eatable, and are often ground and dried to form the closest thing I have ever seen a Scimrahn use as a spice, of garnish. Shek-mo leaves

are even more bitter than their root.

Roots: There are two roots that are major portions of Scimrahn fare. One is the root of the kek-leech, a mildly sweet root that is sometimes processed to make sugar. The kek-leech root is soft when boiled and is a welcome change from shek-mo. The frich-leech is another plant with eatable root, this root is hard and is often gnawed on over time. The frich-leech root is, from other scientist's studies rather nutritious, storing many vitamins and minerals. It also appears that chewing on this root may be important in maintaining good dental health, as chewing on it cleans the teeth and gums. I got in the habit of carrying a small stash of frich-leech and find it satisfying and beneficial to maintaining a healthy diet.

Frich-leech is slightly oily and rubbing it on abrasions and light burns has a soothing affect (probably because of a high vitamin E content). This root has a unique taste that is hearty and rich.

Nuts: To say that nuts are not a common food would be incorrect. At the same time, they are consumed in limited quantities. Often only a few nuts would be served with a dish. I had a somewhat disproportionate exposure to nuts when I stayed with Ahadolko, as he was a specialist in harvesting nuts. He maintained a small grove of Thid-gafr tree from which he would harvest his nuts. There are several other verities of nuts that compose a small portion of Scimrahn diet but the thid-gafr nut is the most widely consumed.

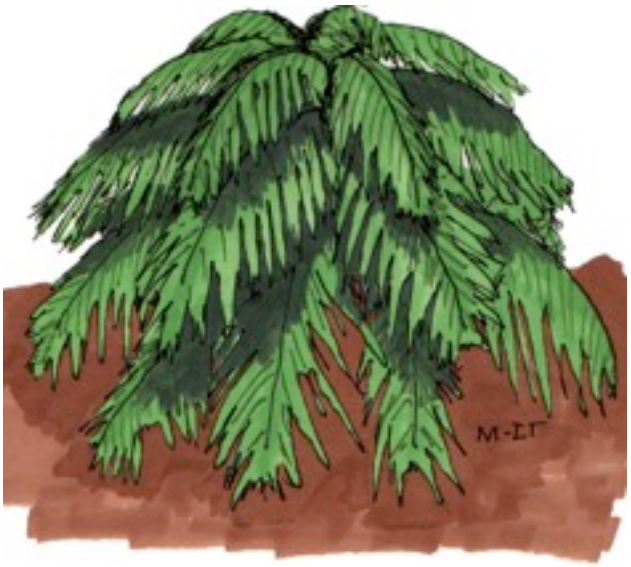
Seeds: There are very few plants that bear an eatable quantity of seeds on The Artifact. Those that do are often frail and difficult to grow underground. (it's actually not a sunlight issue, it has more to do with poor soil conditions). The most widely consumed seed iis from a bush called Boch-gafr that grows a pine cone like seed pod. The pod (simply called Boch) is struck against a hard table several times to release all the seeds. Boch seeds are fried in animal fat and consumed like rice.

Almost immediately the ASO and I-CA have begun growing wheat and other grains on The Artifact to try to supplement the diets of their men.

Water

One of the major difficulties in survival on the Artifact can be getting clean water. Sometimes getting clean water is simply a matter of filtering, boiling or otherwise treating available supplies to make them fit for drinking. Other times water may be so heavily contaminated with toxins of heavy metals that making it drinkable is a large undertaking. Reservoirs may be frozen, requiring the ice be melted to obtain suitable drinking water, or sometimes a reservoir may be "locked down" referring to the valves to the water supply are jammed or frozen shut. In this instance the only way to get to the water is to cut into the reservoir from the top, A difficult and time consuming task.

Clothing



The majority of clothing worn by the Scimrahn and Kelrath are made from the fronds of the "Giant Fern" (mbahch-leech) This material is best described as hemp like in texture. The less affluent wear a course flax like material that is derived from a reed (kezi-leech) harvested from swamp like fields. While it is very sturdy, It is a rather uncomfortable fabric to wear. Often the layer of clothing closest to the skin is made of Mbahch and the outer layers are of Kezi. Another source of clothing is leathers of various animals, Seeter and Kaydoo being the most common.

Photosynthetic Biosphere

The photosynthesis based ecosystem on the Artifact is simple in relation to earth's multiple biospheres (ie tropical, temperate, dessert, etc.) There seems to be only three main divisions in photosynthetic biospheres, these being "Equatorial", "Dessert", and "Subterranean."

Equatorial

The equatorial biospheres are home to some of the largest flora and fauna on The Artifact, despite heavy gravity. Much of the "vegetation bands" has rich soil like that found in river deltas. Immense storms dredge up sediment and dump the silt onto the surrounding land. Very little of the equatorial biospheres is wild. Most of the land area is used in agriculture.

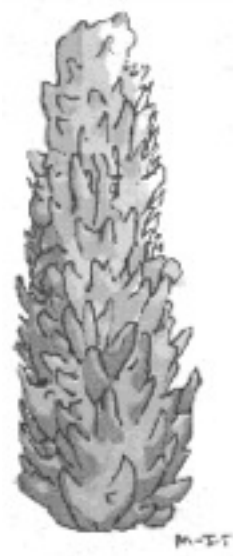
Dessert

The desserts beyond the vegetation bands have thin atmosphere and very little rainfall. The flora and fauna that inhabit these regions are well suited for these harsh conditions. The primary animal life in the desserts is the Kay-doo. This small herd animal is often used as a pack animal.

Subterranean

Underground, there is a large verity of plants that have found ways of surviving despite hostile conditions.

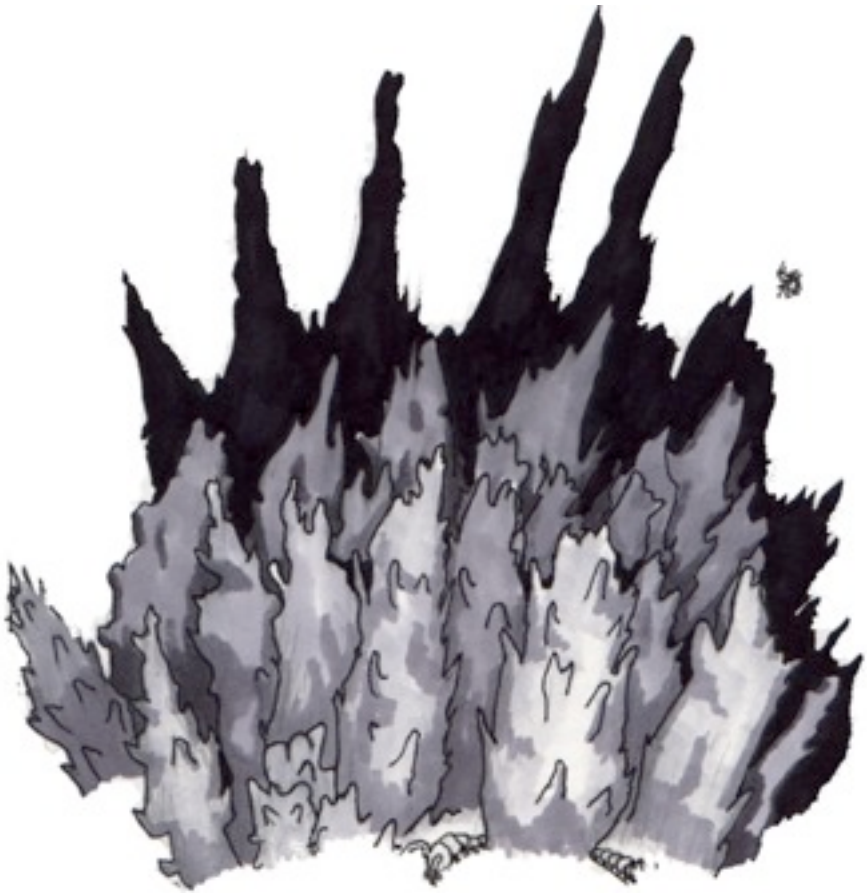
Thermosynthetic Biosphere



While these ecosystems are widely thermosynthetic, it should be noted that there are large pockets of this biosphere that are kemosynthetic. (The prefix "kemo" refers to "chemical", or synthesizing energy from chemical reaction) In this subgroup, bacteria use methane to produce food energy. However the vast majority of this biosphere, bacteria use thermal energy to produce food energy. In these unlit areas a growth called a Fera Sponge creates dense forests of standing sponges. These sponges are not extremely different from those found in Earth's oceans (at least from my observations) aside from the fact that they grow on dry ground, or walls and ceilings for that matter.

The Fera Sponge is a symbiotic organism that houses food creating bacteria. This bacteria are the organisms that carry on the thermosynthisis. The sponge, lives off of waste and gives shelter to the bacteria.

Zah are the next step up in this food chain, feeding on whatever bacteria they can extract from the surface of the sponges. Zah in turn are fed on by Chig, Ekchok, and Seeter. While the Chig and the Ekchok are eaten by Seeter and Bah-bahreeth. The Bah-bahreeth is a winged lizard that hunts nocturnally in lit areas. It is similar in size to a rather large bat.



The Methane Wastes

I have heard reports that the I-CA has been extensively studying the methane wastes. In the reports there is mention of animal species unlike anything I have ever heard of. At this time I decline to discuss what may be rumors or a ruse, but if the reports are accurate, a new chapter in biology may have to be opened.

Language

These are some simple words or phrases I have compiled from our dealings with the Scimrahn, and (as I will explain later) the Kelrath.

Scimrahn

First things first, the spelling of the word Scimrahn is based on the English alphabet, and is not precisely how the name is pronounced, especially according to dialect. In truth, the pronunciation is usually between the traditional "Scimrahn" spelling, and what would be written as "Shebran".

Spoken language

In English the use of complete sentences is considered desirable, in Scimrahn however clipped or incomplete sentences are considered proper form. If for some reason the statement or question is unclear, it is up to the one being spoken to clarify by a question.
A: Busy?
B: Yes.
A: Very?
B: No.
A: Leaving?
B: Yes.
A: Now?
B: No.
A: When?
B: Later.

To many English speaking "Earthers" this conversation would be frustrating, but it is normal in the Scimrahn tongue.

Prefixes

ahm-father: Denoting either a literal father or a ideological one. After a man becomes a father this prefix is often added to his name as a title of honor, somewhat equivalent to "Mister" in English or "San" in Japanese

ahz-female
it - plural

lah-possessive: Denoting where an object is, or who owns it. The usage is smiler to `s at the end of a word in English. This prefix is most accurately portrayed by the Scimrahn words for that and this, being lahchim and lahchaz respectively. Lahchim broken down would mean people (chim) posses (lah). And lahchaz broken down would mean I (chaz) posses (lah). In a sense the Scimrahn words do carry these literal meanings but also change their root word's meaning to "with me" and "with them" (or "not with me"). As such "lah" does not mean ownership, but more who has something.

lo-ownership: While the prefix lah may indicate ownership, the prefix lo is a more definite indication of ownership. For example, the phrase "lahchim, lochaz" translates to "that's mine". While lah deals with who currently has something, lo is closer to who owns that thing. Lah might be used if the ownership of an object is uncertain and lo when ownership is definite.

minah-future: Used sparingly, this prefix is normally attached to a verb and is normally used to express that the action may take place at a later time. I was surprised to find out how often this prefix wasn't used, I was told very politely that I sounded like a moron when I used it frequently. The only times that this prefix was used in everyday speech is in speculation or more accurately denoting something hoped for or looked forward to.

Nouns

book: ke-podo (ke po-do)
Carrier tribe: rahtor ahzchim (rah-tor az-chimb)
CCC (layer stone): rone gieken (rone gie'-ken)
community (town/city): ahzimroke (ahz-im-roke)
computer: chaw-torma (chaw tor-ma)
chronometer: rahbanaw (rah-mba-naw)
cloths: mizrone (miz-rone)
demon (hounds): brouragh (mbro-wragh)
dirt: ienah (ien-ah)
door (door way): kahnahiz (kahn-ahiz)
Enforcer: Togon (to-gon)
fire: frawamis (fraw-amies)
food: zahahnie (zah-ah-nie)
freighter: rahtorzech (rah-tor-zeich)
gift (narcotics): zahahmies (zah-ah-mbies)
hex: grier (grier)
hole: ahiztor (ahiz-tor)
house (home): roke (ro-ke)
I, me: chahz (cha'-z)
ideograms/ideographic writings: En (en)
judge: mbahn (mbahn)
key: rahahimah (rah-ahi-mah)

knowledge: kelgrentha (kel-gren'-tha)
laser: podok-fraw (po-dok fraw)
layer: rone (rone)
light: fraw (fraw)
machine: torma (tor-ma)
man (person, you): keth (keth)
Matriarch: Ahzeken (ahz-i-ken')
Merchant (Carrier) Rahshaho (rah'-shah-o)
mechanic : rahfeahe (rah-fey)
medicine: feahnie (feah-nie)
Minstrel (tribe): Owketh-meahe (ow-keth mbeah-ie)
music: owketh (owk-eth)
musician: rahowketh (rah-owk-eth)
name: loke (lo-ke')
our: loitchahz (lo-it-cha'-z)
people (they): chim (chimb)
place: po-do (po do)
plant (herbaceous/green stemmed): leech (leech)
plant (woody stemmed): gafr (gahfr)
plasma / plasma energy: ofri (owfrie)
Raider: Rahzahm (rah-zahmb)
Scout: Ziekem (zie-kemb)
sound: boah (mboah)
stone: gieken (gie'-ken)
student: rahgrnthah (rah-gren'-tha)
teacher: rahkel-grnthah (rahkel gren'-tha)
tent: roke-chah (ro'-ke chah)
they: itchim (it-chimb)
time: nawch (nawch)
tool: mah (mah)
trade: shaho (shah-o)
tribe: ahzchim (az-chimb)
wall: ienshaz (ien-sh-ahz)
we: itchahz (it-cha'-z)
weapon: pahk (pahk)
wise man / sage: Kelek (kel-ek')
woman: ahzketh (ahz-keth)
word (expressing thought): ke (ke)
world: zipodo (zi-podo)

Verbs
acquire: shah (shah)
approach: torleke-gieth (tor-leke geth)
ask: gomb
attack: resh-pid (resh-pid)
break: feahesh (fey-sh)
breath: romosh (raw-mosh)
buy: shahe (shah-e)
change: pelien (pel-ien)
choose: niso (nis-o)
clean: geith-ienah (geith ien-ah)
close: ahensh (ah-en-sh)
come: torhaz (tor-haz)
complete: pel-resh (pel resh)
control: lah-kahn (lah kahn)
copy: resh-lahchim (resh lah-chimb)
count: chawf (chawf)
cut: pidahiz (pid-ahiz)
do: pel (pel)
drink: ahfies (ah-fies)
drive: lah-podok (lah po-dok)
eat: ahnie (ah-nie)
empty: geth-poahn (geth po-ahn)
enter: ahenshtor (ahen-sh-tor)
escape: doch-balzi (doch bahl-zi)
fear: ragh (wragh)
fight: ziembiz (ziem-biz)
fill: resh-poahn (resh po-ahn)
find: ben (mben)
fix/repair: feahe (fey)
follow: torchim (tor-chimb)
forget: shgrentha (sh-gren'-tha)
give: ahmies (ah-mbies)
go: tordo (tor-do)
guard (protect): zibahl (zi-mbahl)
hear: gren (gren)
help: reshpel (resh-pel)
hurry: chie (chi)
keep: bahl (mbahl)
kill: pelshzi (pel-sh-zi)
know: bahgrnthah (mbah-gren'-tha)
learn/listen: grnthah (gren'-tha)
lift: toresh (tor-resh)
look/see: bek (bek)
make: meahe (mey)
manipulate: topelien (to-pel-ien)
miss: shipid (shi-pid)
move/carry: tor (tor)
near: leke-gieth (le-ke gieth)
open: ahiz (ahiz)
push: pitor (pi-tor)
ride: torrahshah (tor-rah-shah)
rub: toch (toch)
run: doch (doch')
sell: shahien (shah-ien)
sleep: iensh-pelzi (ien-sh pel-zi)
smell: mok (mbok)
speak/talk/say: keboah (ke-mboa)
stand: dof (dof)
start: nawtor (naw-tor)
stop: shtor (sh-tor)
strike/hit/punch: pid (pid)
taste: ah (ah)
touch: tok (tok)
walk: dok (dok)
warn: kebahlzi (ke-bahl-zi)
wear: shahmizrone (shah-miz-rone)
work (job): pelmeahe (pel-mey)
write (phonetic): pelboah (pel-boah)
write (ideograpic): pelen (pel-en)

Other
about: geith-ien (geith ien)
accept: shawcha (shaw-chah)
across: kem (kem)
and (plus): resh-chawf (resh-chawf)
angry: ziem (ziem)
any: onis (onis)
awake: pelzi (pel-zi)
bad/poor/less: gieth-ke (gieth ke')
before: nawbawke (naw-bawke)
big: resh-leke (resh leke)
bright: resh-fraw (resh fraw)
cold: gieth-miz (gieth miz)
danger: agh (agh)
dark: gieth-fraw (gieth fraw)
dead: shzi (sh-zi)

destroy: shtah (sh-tah)
different: ien (ien)
difficult: sh-torpel (sh tor-pel)
direction (way): podok (po-dok)
down: dopodo (do-po-do)
fast: resh-tor (resh tor)
first: bawke (baw-ke)
for: minah-lah (mbinah lah)
free: ro (row)
gone: torbaw (tor-baw)
good/more/well/fine/alright: resh-ke (resh ke')
happy: resh-zi (resh zi)
hard: olch (olch)
heavy: zechah (ze-chah)
hot: resh-miz
hurt/wounded/injured: geith-zi (geith zi)
if: she-iennis (sha-enis)
in (same as enter): ahenshtor (ahen-sh-tor)
last: resh-tah (resh tah)
left: ienpi (ien-pi)
like (enjoy): resh-zimeahe (resh zi-mey)
light (not heavy): gieth-chah (gieth cha)
live (living): zi (zi)
lost: podobes (po'-dombess)
many: resh-pah (resh pah)
maybe/uncertain: shech (she-ch)
method (way): kahn (kahn)
must: shawpel (shaw-pel)
my/mine: lochahz (lo-cha-z')
new/young: gieth-nawch (gieth' nawch)
next: nawtah (naw-tah)
no/zero/nothing: sh (sh)
not (never): iensh (ien-sh)
now (is, happen): iennis (enis)
old: resh-nawch (resh nawch)
out: ahiztor (ahiz-tor)
ready: peliennis (pel-enis)
right (direction): zempi (zem-pi)
sad: geith-zi (geith zi)
same (together): shien (shien)
slow: gieth-tor (gieth tor)
small: gieth-leke (gieth leke)
smart: kelresh-ke (kel-resh ke')
size: leke (leke)
strong: thezen (thee-zen)
that: lahchim (lah-chim)
this: lahchahz (lah-cha-z')
true (correct): shaw (shaw)
unwise (foolish, silly): kelgieth-ke (kel-gieth ke')
up: bepodo (be-po-do)
very: resh (resh)
want (need, desire): kelahz (kelahz)
warm: miz (miz)
wrong (false): shishaw (shi-shaw)
yes: cheg (cheeg)
your: lochim (lo-chim)

Question Words

what (question): gomb (gomb)
when (what time): nawch gomb
why (what reason): kelgomb (kel-gomb)
where (what place): podo gomb
how (what method): kahn gomb
how (what direction): poduk gomb

Unique Words

Gomb: This word is translated as "what", but it also denotes that the speaker is asking a question, much like a question mark at the end of a sentence. For example: "lahchim shaho keth kelahz gomb" translates to "you want (to) trade that?"

Pord: This is a proper noun indicating a community area. Often located at the center of town, the Pord is a place to buy or sell, talk, eat, sing, entertain, etc. In fact in Scimrahn culture many things are only done in the Pord. Doing them anywhere else would be considered rude.

The Kelrath Language

Although the pronunciation of the name Scimrahn is up to dialect, the word Kelrath is simply wrong. The true pronunciation is actually closer to "kel-grith". The original spelling is drawn from the transcripts of conversation with the Geetin prisoner who at the time appeared to have a throat infection. However my arguments to have the official spelling and pronunciation changed have not gotten very far. Keep in mind however that when saying "Kelrath", pronounce it "Kel-grith" especially when attempting to fool someone into thinking that you are one.

The following is a small sampling of essential Kelrath words I was able to compile, this list is not nearly as complete as the Scimrahn listing but it serves for some rudimentary interaction with the Kelrath.

bad: hephuk (heph-uk)
don't know (don't understand): gychk yvoltha (gy-chk y-vol-tha)
down: fit (fit)
fast: dahom (dah'-om)
food: gavoth (gav-oth)
go: fadin (fa-din')
good: volchk (volchk)
goodbye: nuvo (nuvo)
have access: mahnin (mahn'-in)
hello: pheli (pheli)
how: gelo (gelo)
left: vorud (vor-ud')
man: rakuchk (rak-uchk)
me: voj (voj)
name: maphat (ma'-phat)
no: gychk (gy-chk)
own: dathavo (dath-avo)
quiet: kol (kol)
Rantaa' family head: Mahalin (mah-alin')

slow: thichk (thi-chk)
stop: merchk (mer-chk)
right: gezum (gez-um)
up: yrok (y-rok)
us: helel (he-lel)
what: jeko (je-ko)
when: moko (mo-ko)
where: sido (si-do)
who: daho (da-ho)
why: buto (buto)
woman: lojif (lo-jif)
yes: wami (wam-i)
you (singular): bawen (baw-en)
you (plural): kusaj (kusaj)

Numbers

Kelrath numbers are the same as Chezbah numerals, this may be because many things in the Artifact are labeled with these numerals such as plasma conduits and Hosent. It may not have been practical for the Kelrath to re-invent the wheel.

Common Names

These are the most common Geetin names. These names are sometimes seen in higher castes.

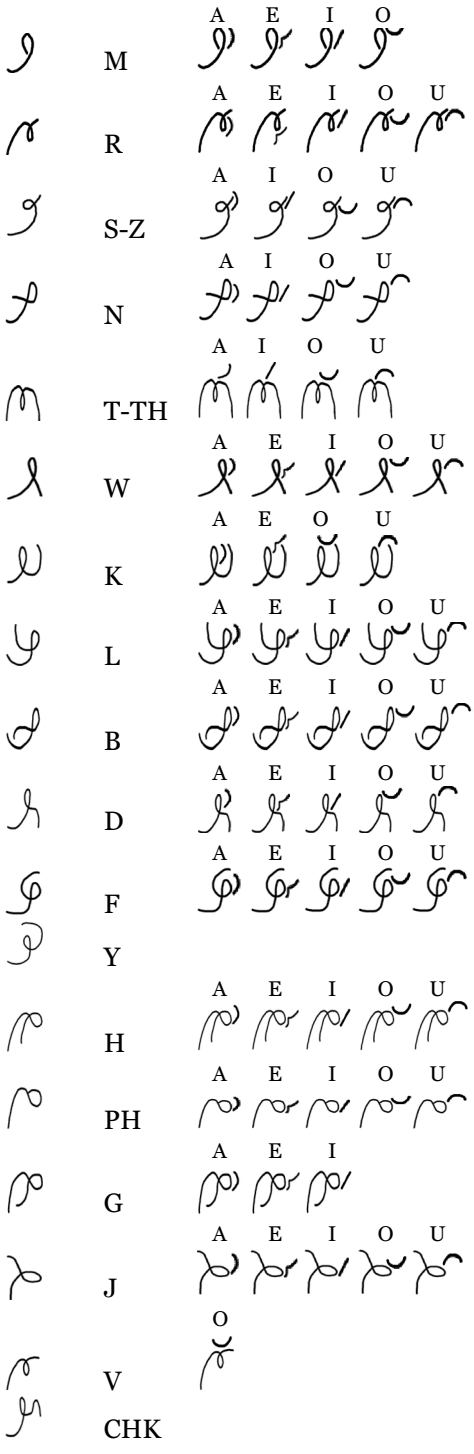
Male
Hessik
Rannil
Szarros
Metizih
Votusk

Female
Rahnzi
Rinkuz
Largsum
Menichk
Loma

Kelrath Alphabet

The Kelrath Alphabet is significantly different from the Chezbah and Scimrahn alphabets. In it's written form, each consonant starts at the bottom of the line and progresses upwards to a loop, and then on to form the rest of the letter. These characters are also written using only one continuous stroke. This results in a flowing body of each character that is a form of calligraphy.

Vowels are secondary characters that modify a consonant and are written as tiny accent marks next to their consonant. Because of this words and names that are Kelrath native can never begin with a vowel sound. This rule is exempted when writing Scimrahn or Chezbah words by an accent mark before the first consonant. Another unusual rule to the Kelrath language is that certain consonants can only be followed by a select set of vowels. This is shown in detail below. These combinations must be memorized if one is to be proficient in writing the Kelrath language.



The Scimrahn

Gadios

Gadios is the Scimrahn's primary city. There are a few large industry tribes, but none that come close to the population of Gadios. While much attention was put into determining the political structure of the city in the ASO's first months of setting up a base of operation, much has to be learned as far as the city culture. The shanties surrounding Gadios are peopled mainly by transients, and therefore the culture in the cities surrounding area is more or less "standard" Scimrahn. However, those that have lived in the city for extended periods have a significantly different outlook than the average tribe.A cursory overview of the differences encountered follows.

Longer life spans is one of the benefits from living in Gadios. This has changed much of the city resident's outlook on life and their desires.

Kelrath cultural influence. Because of the proximity of the Kelrath, an unusually high amount of interaction takes place between Gadios and the city of Penalon.

Private space and personal space are two very strongly developed concepts in Scimrahn tribal life. Clear guidelines dictate what is and is not acceptable in regards to "personal space". However because of the large population and larger distances involved, those lines are blurred and redefined in Gadios.

Inter-tribal relations are more extensively developed in Gadios. Issues such as inter-tribal law and city policy are unique to Gadios. One example of this is the judging of those accused as criminals. The Matriarchs of tribes appoint judges to hear native and inter-tribal disputes. In the case of an inter-tribal dispute, the judge also has representatives from other tribes sit in on the dispute. The representatives also give their opinions on the situation at hand, and normally the judge will honor their opinions especially if they are unanimous.

Music

Scimrahn music is difficult to become accustomed to, it is one of the few things

about the culture that is truly unique. I am no music expert, but I will do my best to relate the experience of Scimrahn music.The musician sings in a style I can only liken to the Arabic Criers at mosques. The two are no doubt very different, but it is the closest I can make an approximation to. To this point I have taken to calling Scimrahn musicians criers (the Scimrahn word for them is Rahowketh). Sometimes there may be many singers or criers that will sing together. This is most often done when entering a battle, or to taunt an enemy on the battlefield. The effect is very eerie and I can only liken the far off sound of these singers to the sound of bagpipes for their disquieting nature.

Often in a Poord a crier will play for a small crowd for their enjoyment. The crier does not play any instruments in the conventional sense. Instead, before and during the session he sets up a device called a Zeidowg. The Zeidowg is essentially a computer with preprogrammed software. This device then listens via microphone to the crier and the pitch and pace of their song. The Zeidowg generates tones based on the criers voice, and prerecorded sounds and manipulates them.

The process is very structured, and contrary to my first impression that the process is random, a demonstration showed me that the crier actually controls the Zeidowg with his voice and a series of settings on the device.

Guided by Signs

Scimrahn Scouts use a graffiti like language called En to leave messages of all sorts. This language in signs is uses ideographic symbols to communicate with other Scimrahn information pertinent to the area. This is most often information on where the Scout is, where food may be found, what tribes travel through the area and the proximity of enemy forces.

The amazing thing about this method of communication is that it is subjective to the writer's style and therefore is not a static language. There are a few advantages to this. The Chezbah priest's ability to understand any language and their ability to crack encryption is a hinderance to the Scimrahn. The Priest however do not seem to easily understand En. This may be because ideograms are not easily deciphered. With a phonetic language once a few letters are deciphered the reader can recreate the language. (This by itself is often a great deal of work, but the Chezbah seem to be unusually adept at it.) An ideogram of a bowl may mean a bowl or food or a number of other possibilities. Scimrahn En writers often take advantage of ambiguity to convey a incorrect message or something meaningless like a joke to those who do not sufficiently understand their style. Another advantage of a progressive language is that old signs may not be accurate anymore. The aging style of the En used is in a way "dated" and is then taken with "a grain of salt".

The most common and constant En are the calender and the signature. The calender is the Scout's schedule and also gives hints as to the scout's style. The calender is often depicted as a spoked wheel. Each division within the wheel depicts or describes a landmark, or some point of interest. The calendar also tells how long it takes the scout to complete the cycle on the calendar. From the calender, someone skilled in reading En

can also tell approximately where the scout should be at any given time.

The signature is used to tell who is the writer of the sign, but has also come into more common use to do things like mark property and leave a calling card. The signature is a idealized animal above the picture of a banner flag. The flag symbol contains signature signs that represent the writer's name and tribe.

One of the most fascinating things about En is that it is probably the most technically and artistically advanced art in the Artifact. Chezbah and Kelrath art both resemble very early Egyptian art and seems that there has been little change in Chezbah art in thousands of years. En has references to some of this style, but has advanced in a great number of ways. In many ways En is The Artifact's equivalent to the Italian Renaissance and the development of Impressionistic and other more modern ideas.

Traveling Under Cover

Enemy forces can sometimes be avoided by traveling through tunnels that pass through hexes. The tunnels can present their own challenges as they are not always empty.

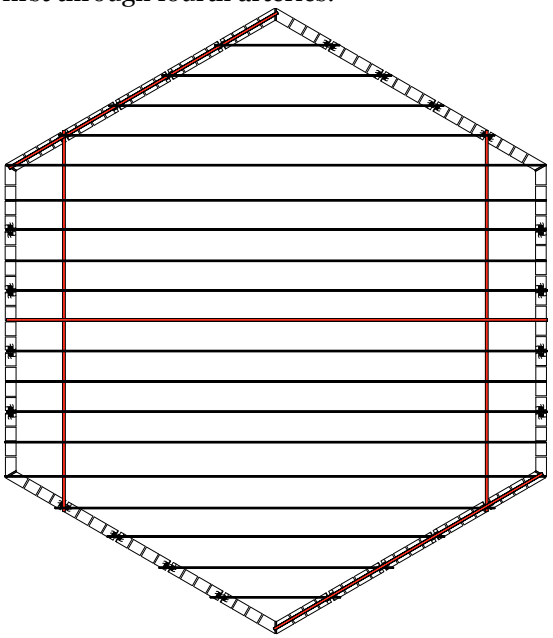
Every hex has three layers of tunnels that cross each floor at different angles. (Agricultural hexes have three floors, Industry hexes have six, and Residential hexes have fifteen) and three layers that cross the ceiling.

Five main arteries feed smaller tunnels that are spaced approximately every seven hundred meters. This is seen on page 17, a single layer of the conduits are shown in red. The larger arteries are the thicker lines.

The first two main arteries in a layer runs inside parallel walls. These branch into a third and fourth artery that run sixty degrees to the first two. The third and fourth are also parallel to each other and are approximately eight hundred meters from the closest wall. The fifth main artery is perpendicular to the third and fourth and bisects them and the hex.

This middle artery or bisecting artery in the ceiling of a hex is often used for maglev

rails for mass transit. The smaller tunnels run parallel to the fifth artery and intersect the first through fourth arteries.



Bisecting arteries connect to the other bisecting arteries on other tunnel levels by means of short vertical tubes.

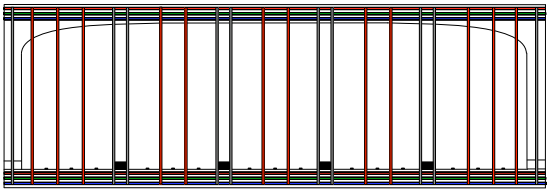
The next level is identical to the first but turned sixty (60) degrees. The third level is turned another sixty (60) degrees, or one hundred and twenty degrees (120) total. This is illustrated as the first or top layer of conduit in red, the second or middle layer in blue and the third layer in green.

Tunnel arteries are roughly ten meters in diameter and are cylindrical except in subfloors of residential hex sub floors where they are flattened on the top and bottom so that they are only five meters in hight and ten meters wide.

Secondary tunnels are five meters in diameter. Electrical Tunnels have several carbon conductors that are elevated to a hight of one meter. These conductors are approximately ten centimeters in diameter. High power conduits like those found in the power and industry hexes have more conductors and these conductors have a thin layer of insulation around them. It should be noted that when in any proximity to these conductors, unshielded electronics may not function or even may be damaged by the powerful radio waves emitted from the electrical field. Radio also may not function properly.

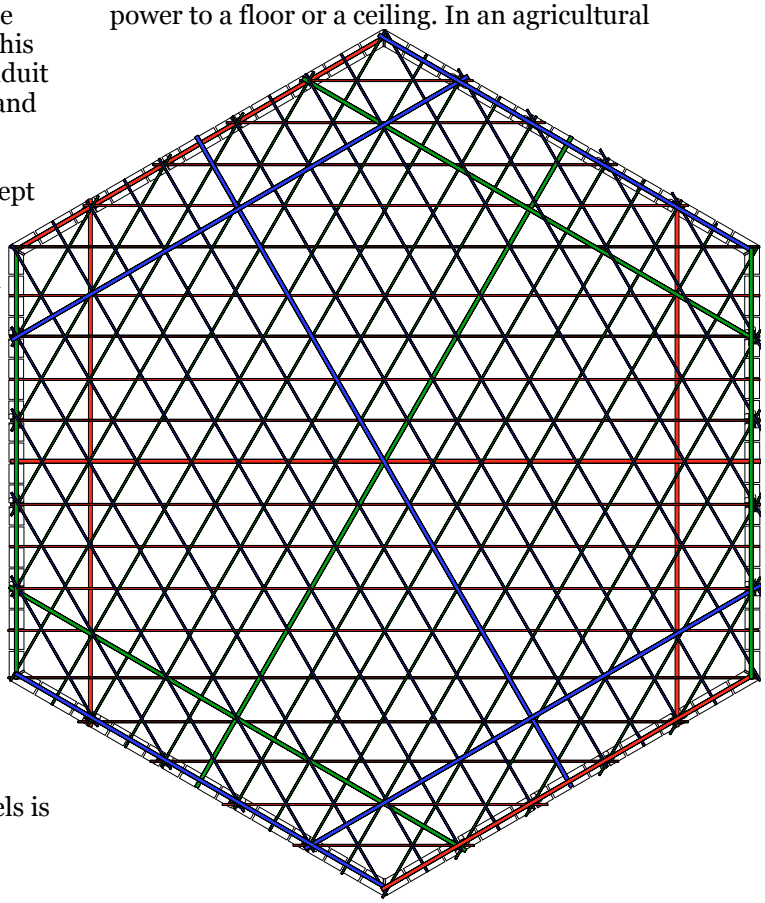
Another feature of electrical tunnels is in the bottom bisecting artery in the very center of the hex. A mainframe QLC (Quantum Liquid Computer) that controls various aspects of the hex are found here. There is only one mainframe per hex.

Ventilation tunnels are often in a conduit layer that is closest to a ceiling. These conduits are usually free of any kind of obstruction except for vertical vent shafts in the floor of the conduit that have fans to move air into the hex.



Each wall also has vertical and horizontal tunnels that are used for transport between levels. Vertical tubes in grey contain conveyors that move material and people in between layers.

Each tunnel connects to the floor above it and the ceiling below it via vertical tubes. These tubes are found at points where the tunnels in different layers overlap. These vertical tubes are sometimes plugged to prevent dissimilar tunnels from connecting. Other times they have mechanisms for transporting either water air or electrical power to a floor or a ceiling. In an agricultural



hex, a floor might have a drain grating and an electrical coupling while a ceiling has sprinklers and an air duct. See: The Artifact RPG pg 89

Power Hex Conduits

Several types of tunnel exist and depend on the hex they are in. Power hexes use two thirds of the tunnels in them to carry electrical power. The type of tunnel in this electrical distribution system use wires carrying extremely high voltages. One layer circulates air throughout the hex. However the conduits have some difficulty transporting enough air throughout the hex to keep the air fresh. Often dust and molds accumulate in the power hex. The other layer of the tunnels carry water and solid wastes to the surface and bring fresh water back into the incremental city.

Power Hex Floor
Top Layer: Water circulation in between city levels from filtration hex.
Middle Layer: High voltage conduit.
Bottom Layer: High voltage conduit and Hex Mainframe.

Starting from the bottom of the Power hex, the first two tunnel levels are high voltage power conduits. The tunnel level closest to the floor (the top most layer in the floor) carries wastewater out on one side of the hex and on the other, brings fresh water in. because of this, the tunnels on either sides are separated by tunnel plugs two meters thick.

Power Hex Ceiling
Top Layer: High Voltage and Mass Transit
Middle Layer: High Voltage and Mass Transit
Bottom Layer: Air circulation and Mass Transit

In the ceiling, the floor arrangement is mirrored. The lowest tunnel level the level closest to the ceiling surface is used to circulate air. The levels above that are high voltage conduits. All three of the bisecting arteries in the ceiling are used for the mass transit system.

Industry Hex Conduits

Industry Hex Bottom Floor
Top Layer: Low voltage conduit, high to low voltage transformers
Middle Layer: Water circulation
Bottom Layer: High voltage conduit and Hex Mainframe.

Industry Hex Ceiling
Top Layer: High Voltage
Middle Layer: Air return circulation
Bottom Layer: Fresh air circulation and Mass Transit

Industry hexes must transmit electrical power to the rest of the hexes, but only half of the electrical power that goes into the industry hexes continues to the rest of the incremental city. Two tunnel levels on the very top of the hex and at the very bottom are the same high voltage lines found in the Power hex. A large quantity of water is used in manufacturing, so the majority of the tunnels in the industry hex move water. The second level circulates water, and the third transmits lower voltage power to the Hosent.

Industry Hex Middle Floors
Top Layer: Low voltage conduit
Middle Layer: Water circulation
Bottom Layer: Air circulation

The next five floors of the hex are identical to each other, the lowest circulates air for the floor below, the next circulates water to the floor above, and the top transmits electricity. The hex ceiling uses it's lowest level to circulate air to the floor below, the second transports waste water from the filtration hex to the power hex.

Filtration Hex Conduits

Filtration hexes use one third of their tunnels to transport water, one third to cycle air, and one third to supply power to the filtration pyramids.

Filtration Hex Floor
Top Layer: Filtered water out
Middle Layer: Waste water in
Bottom Layer: Low voltage conduit , high to low voltage transformers and Hex Mainframe.

The lowest level of the filtration hex is used to transmit electrical power to the pyramids. The next brings wastewater in and the tunnel layer closest to the floor, sends freshwater out to the city.

Filtration Hex Ceiling
Top Layer: Low voltage conduit , high to low voltage transformers
Middle Layer: Air return circulation in
Bottom Layer: Fresh air circulation out

The ceiling mirrors the floor. Freshly filtered air is sent out in the lowest level, while the level above brings stale air in. The highest level powers the pyramids that hang from the ceiling.

Agricultural Hex Conduits

Agricultural hexes use two thirds of their tunnels for transporting water throughout the hex and back out. One twelfth of the conduits carry electrical power and one fourth circulates air. Each of the three floors of the Agricultural hex have three tunnel levels as does the ceiling.

Agricultural Hex Bottom Floor
Top Layer: Wastewater collection
Middle Layer: Wastewater circulation out
Bottom Layer: Low voltage conduit and Hex Mainframe.

Agricultural Hex Ceiling
Top Layer: Fresh water in
Middle Layer: Fresh water distribution
Bottom Layer: Air circulation and Mass Transit

The next two tunnel levels up take drain water away from the hex, but the middle layer is used to transport water to the filtration hex.

Agricultural Hex Middle Floors
Top Layer: Wastewater collection
Middle Layer: Fresh water circulation to floor below
Bottom Layer: Air circulation

The next two floors are identical, the lowest tunnel level is used in air circulation. The middle layer brings water into the hex for irrigation, and the layer on top that is nearest the floor above is used too take drain water away from the hex. The first level in the ceiling circulates air to the floor below. The middle layer irrigates the floor below and the top brings water into the hex from the filtration hex.

Residential Hex Conduits

Residential Hex Bottom Floor
Top Layer: Wastewater collection
Middle Layer: Fresh water in
Bottom Layer: Low voltage conduit and Hex Mainframe.

Residential hexes have fifteen floors. On the first floor the tunnel levels start with electrical conduits on the lowest level. The second is for bringing fresh water to the rest of the hex floors. The top layer of this floor collects waste water from the rain system at the center of the hex, and from the residential structures on the lowest floor.

Residential Hex Ceiling
Top Layer: Air return circulation
Middle Layer: Fresh water distribution
Bottom Layer: Fresh air circulation and Mass Transit

The ceiling's first tunnel layer carries air to the floor below and to the garden in the center of the hex. The second brings fresh water to the residential floor below and to the rain system. The top most layer connects to the vertical shafts in the walls and draws air in for circulation.

Industry Hex Middle Floors
Top Layer: Wastewater
Middle Layer: Water circulation
Bottom Layer: Air circulation and power distribution

The middle fourteen floors repeat. The lowest tunnel level on these floors carries air for the floor below. the second level carries water for the floor below and the third level carries away wastewater from the floor above.

Reservoir Hex Conduits

Reservoir hexes use the lowest tunnel level to carry water to pumps. The next two two levels carry water to the rest of the city. In the ceiling the first two levels bring filtered water back into the reservoir. The top reservoir tunnels are used for electrical transmission and power water pumps.

The Reservoir Hex is the only hex where the mainframe is on the top level of conduits.

The Chezbah

Despite our having more direct communications with the Chezbah, we have learned very little about them. The truth being it seems that our relations with the Chezbah may have slowed our progress in delving into the deeper aspects of their society. Diplomacy has made it difficult to be more direct in learning more than what is on the surface.

Definition and Pronunciation

Loc (lohk)
The primary Chezbah deity. The source of the Loc personality is unknown. while Scimrahn sources describe Loc as a driving force and acknowledge him as an "evil god" very little is written as to the origin of this belief. Loc is the name of The Artifact that all native people recognize. To the Chezbah The Artifact is the body of Loc.

Chezbah (chez-mbah)
The nation that serves Loc. A theocracy that is ruled by a priesthood who owe their allegiance to Loc.

Kelahn (kel-ahn)
A word that is normally translated as priest, but literally means "god's thoughts". These priests are the ruling class of Chezbah.

Kelpei (Kel-pei)
The high priesthood that is above all other Chezbah and hand down laws to the people. The word Kelpei is translated as instructor but has additional meaning. Kelpei not only indicates giving knowledge, but also as giving wisdom.

Religion

Religion is the predominant focus of Chezbah life, indeed there is no distinction between the Chezbah nation and religion. They are one and the same. The predominant beliefs of the Chezbah are as follows. Loc is the primary deity and while there are other gods mentioned, they are said to be evil. Loc is also the only deity that is given a name. The Chezbah believe that when a loyal follower is about to die, Loc "absorbs" their mind into himself. Something like a cosmic consciousness

Masks

Chezbah use masks during ceremony and worship. The only ones exempt from wearing these masks are the priest. These masks are made by specially licensed artisans that create the masks to exacting standards. This ritual practice has been difficult to study because no one has been permitted into a Chezbah festival. Scimrahn sources have had little or no information on this matter because the length of their exile has erased many of the aspects of Chezbah culture from their lives.

Law

Chezbah law is handed down by the Priests and is enforced by the Warriors however there is not enough priests and warriors to maintain a constant watch over the populous and still maintain the wars on the Scimrahn and Kelrath. To fill the void, a community of pious men called "Ahnpel" (which translates "as god does") which are chosen by the priesthood will hold lawbreakers until a traveling Priest can hold a trial.

Home Life

Each floor of a residential building has a large community area in the center and private areas along the walls. Chezbah who are not married live in the central community area and are not permitted to enter a private area until they have a mate. It is assumed that this is the origin of the Pord in Scimrahn society.

The Chezbah strictly enforce the number of mates a man can have based on his religious fervor. The method of determining this is a mystery that the Scimrahn have not been able to shed any light on.

The most unusual Chezbah settlements are those in the vegetation bands. In areas where there is no underground access (mainly near the equator) cities are constructed every year after the stormy season. Married families build houses out of clay that are then covered in a white paste found in mineral deposits. Community homes for the young and unmarried are large structures in the middle of the town. A large stadium size structure is erected just outside of town is a religious center. Although the

population of these small towns are seldom enough to fill such a large structure.

Warriors live in communal homes like barracks but have many comforts earthers do not normally associate with modern military life. When at rest, the Warriors have servants that take care of them. Often one male servant is the Warrior's assistant, helping the Warrior prepare for combat, maintaining his weapons and armor. In addition to this the Warriors have several female servants. However it does not appear that the Warriors take mates from these servants, strongly encouraging the notion that the Warriors are not human at all. The most difficult thing to explain is how the Warriors reproduce. No female equivalent of a Warrior has ever been seen. Some speculate that the Warriors are cloned, but genetic tests have made this scenario unlikely since the Warriors have similar but not identical genetic makeup. Large scale study of the Warrior's genetic material is very difficult because of the nanometer scale devices that permeate their bodies. These can throw off the results of a test and so therefore must be removed from the tissues, a long and difficult process.

Approximately half of all Chezbah live on or within 300 km of the surface. The other half live in the region of the plasma collectors. These Chezbah that live far underground are the population given the task of repairing The Artifact. A full eighty percent of the Chezbah military are found defending the collector wells and the industry pods.

Business

Business is not the open commerce model that Earthers are used to. Industry works for the Priests, however the Priests also compensate a company for working for him. One of the primary occupations is young people rebuilding incremental cities. These people are paid to do this work, they then buy food and tools and supplies to do their work with. Then as their work is done they begin to supply their children with food and resources.

Serving the Priesthood

For the most part the priesthood is supported by a ten percent tithe. However this only accounts for material goods, concubines and manservants. Many other services are provided by skilled artisans that are employed by private businesses.

Serving the Warrior Class

In a similar vein Warriors are taken care of by private industry. In addition, the Warriors require a large quantity of military hardware that private industry supplies.

Warriors also have several servants that take care of of them medically and while at rest.

Farming

Most of the faming done by the Chezbah is done in the vegetation bands. However some incremental cities that have been rebuilt can support most of their population. The only factor in where food is grown, is the settlement's depth under the surface. Below 300 km communities will produce approximately a half of their own food. Below 1000 km a community will produce almost 90% of their own food.

Entertainment

Despite a very high level of technology, the Chezbah do not have a highly technical entertainment industry. Most entertainment is done by individual or groups of actors or singers that travel from place to place performing for often very large audiences. This is how the Scimrahn movement was able to build it's followings. Through small bands of entertainers spreading their message of dissent from location to location. This is also the source of the Scimrahn minstrel tribe system. As a result of the Scimrahn uprising the entertainment industry suffered a severe blow and the Priests now regulates that all entertainers must maintain a certain "level of piety". Again the how this is determined is not known and probably is an arbitrary measure.

Industry

Industry consists mainly of producing weapons and equipment for rebuilding the Artifact. Minor industries produce clothing and personal goods.

The majority of industry is the production of CCC in the industry pods. While no one has ever reported the processes that take place within these pods, the Chezbah produce thousands of tons of CCC and some of the finest HDCCC on the Artifact. Where the raw materials come from to make the CCC is a mystery. Some of the raw materials is

recycled from old collapsing hexes or Kelrath cities that have been taken over. The Chezbah are the only group that has been trying to preserve the Artifact.

Military Service

(E-suit pilots, officers etc.)

Military conscripts are often chosen from the young men. While the Warriors are the all purpose grunt, conscripts are e-suit pilots and man the Chezbah vehicles.

Technology

Technology is viewed as holy and not much different than magic by the average Chezbah. This is not surprising because with the Hosent to build equipment, the people need only feed them raw materials and make a few decisions as problems arise. The Chezbah view manufactured goods as coming from Loc, (or the body of Loc which is The Artifact) and therefore all technology produced by the Chezbah as holy. This also makes producing technology apart from Loc as a blasphemy. This has caused a lot of confusion among the Chezbah on how to view Earthers who have their own manufactured goods.

The Priests have told the people that Earthers are exempt from this law as long as goods are not produced on the Artifact.

Visiting the Kelrath

Although most of my records were destroyed and most of those that weren't, were classified as top secret (due to the nature of the mission we were on), I have been permitted to share some general observations about the Kelrath.

On the whole I found the Kelrath stern, serious, and very, very set in their ways. The Kelrath can often pick out any abnormalities from their norm. In some circles, Scimrahn technologies are considered "fashionable" but even this relative normalcy is often looked down upon. I have very rarely seen a society so rigid in their customs outside of religious practices. Indeed, Kelrath traditions seem to be the religion that is being followed. Kelrath means "student" roughly translated. Students of the Tanroc Fredar, it seems.

From what I have experienced, it seems many of the traditions handed down by the Kelrath are teachings of, or extrapolations from teachings by the Tanroc Fredar. I question the wisdom of anyone that would oppress eighty percent of the population under a harsh tyranny.

There are references on walls of temples to records of the Tanroc Fredar teachings, but we were not able to find any of those records. In some temples there are quotes from those records and many Kelrath can recite a few dozen from memory, but even those Kelrath that

we were able to ask how to find these recordings could offer us no help.

One very interesting deviation from tradition is what seems to be a growing black market for perfume among the Kelrath. The fact that the Kelrath have reacted so enthusiastically about a new idea is quite surprising. However, more true to form, most Rantaa' family heads have outlawed the use of perfume. (Paradoxically, it is the Rantaa' class that has driven the demand for perfume.)

Kelrath Cities

Kelrath cities are arranged around the Rantaa' palace. Around the palace are smaller Rantaa' mansions, temples to various oracles, stately gardens fenced in by high walls, etc. Around these structures are the Kaloord homes that make up nearly a third the city, but only houses a sixth of the city population. In this area are temples to lesser Oracles, and the marketplace. Major roads often radiate from the Rantaa' palace or major temples, making them always visible while traveling in the city.

Around the perimeter of the Keloord are Gijorn long houses. Of all Kelrath structures, these are the most recognizable. Each long house is five meters on the narrow ends, with a door in the middle. The long walls are between fifteen and twenty five meters long. There are no doors on either of the long walls. Around the top of the long house just below the roof is a narrow opening supported by metal bars or heavy posts. This opening serves two purposes one for light and ventilation, and two, if the city is attacked, the long houses serve as a protective wall. The narrow opening can be used to fire out of from the hardened structures.

Outside of the protective row of long houses lives the vast majority of the population. Here the Geetin slums stretch out for hundreds and hundreds of meters. Also beyond the perimeter are storehouses, and hangers for military vehicles.

Kelrath Society

One of the first things that I noticed about the Kelrath is a near complete lack of interest in efficiency. Slave labor makes flaunting inefficiency almost a status symbol. Any well to do house will have no doors, instead, a Geetin stands guard and a heavy curtain keeps out the cold. In Kelrath Kaloord and Rantaa' houses doors are only used to protect valuables. A door on the front of a Kaloord house would be like boarding the windows in your house.

In most Kelrath circles, using electronic equipment is considered to be something a less affluent person would do. This is because most devices are "labor saving", and Geetin do labor. A rich person has more Geetin, and therefore needs no devices.

In the Kelrath culture, architecture is one of the primary status symbols. All structures are built in accord with guidelines dictated by caste. A Geetin home, if it is a free standing structure, is to be no more than one hundred and seventy centimeters tall. For a Geetin to erect any portion of his home above this height is a supreme form of rebellion. The Geetin who is bold enough to try building anything over this height is inviting the Gijorn to burn the structure down along with anyone who might be inside. The other option is to have an underground or subsurface dwelling which is more popular than the afore mentioned structures. Gijorn have absolutely no choice in the construction of their homes, all Gijorn live in longhouses as described above. Kaloord homes have few guidelines, but oddly enough, are restricted to a specific weight of all the construction materials. I did not have the opportunity to quantify the weight restriction. And of course, Rantaa' have no real restrictions to their construction projects. This means that the Rantaa' own any large structure to be found in a Kelrath city. One way that Kaloord work around this size (or weight) restriction is to have a network of structures that are not physically connected.

In my short exposure to the Kelrath, I had seen some interesting building networks that were "technically" not connected.

The Geetin

The harsh conditions that the Geetin endure is a testament to their character. The few Geetin I was able to interact with were wonderful people that were warm and highly communal in nature. I don't know if it is from their hardship or because Geetin are allowed to own no property, they have no trace of greed.

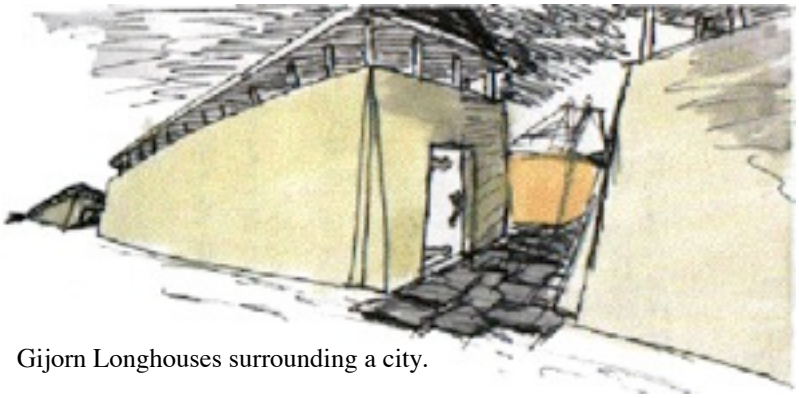
Everyone freely gives what provisions they "have access" to never trying to keep anything from others.

The most unexpected thing I learned about the Geetin was the happiness and joy that they have. Despite their oppressed state, the Geetin still manage to have warm extended families, strong ties between friends, and a strong sense of humor! I was continually amazed by this until a very simple statement explained it to me, "We are alive, and while we have love for others, we will be happy". This kind of folk wisdom is prevalent among the Geetin.

The Gijorn

The Gijorn are a complex Caste, following extensive hierarchies. While a large number of the Gijorn police the Geetin and command them in battle, a portion of them have higher appointments.

Gijorn schools in combat follow one of "The Four Ways" those being the ways of Rall, Pho'duk, Rugen, Sha'duk. These are listed in order of frequency, Rall being the most frequent and Sha'duk being the least frequent.



Gijorn Longhouses surrounding a city.

Gijorn schools of combat are the highest level of education a Gijorn can attain. These schools require a student pass a series of trials to prove their worth. Only a few pass these trials. Trial by combat is common often beginning with a long trek to the combat site and ending in the death of a participant.

Schools of Rall emphasize the philosophy that defense is superior to offense. Often a student of Rall is taught to protect first and when the enemy is weakened from repeated attacks, then is the time to strike.

Followers of Pho'duk are taught among other things, to gain the advantage by being the first to strike.

Schools of Rugen teach law and philosophy of Kelrath culture as it pertains to the Gijorn. In combat students of Rugen are allowed special rights among the Gijorn. It is illegal for a lower caste member to strike a higher caste member. However students of Rugen know the Kelrath law and therefore are better suited to judge situations. Students of Rugen are the highest position a Gijorn can attain to, and are even permitted to carry out the execution of Rantaa'. Of the schools, the schools of Rugen are the most formidable in combat.

The followers of Sha'duk are butchers. They tend to be unpredictable and very deadly. Sha'duk students are often employed in covert actions against the Chezbah.

Rantaa' Books

Rantaa' carry books in which they record their transactions with Oracles, personal wisdom, interpretations of Tanroc Fredar writings, etc.

Some Rantaa' carry these as relatively small books. Some who are more prolific (or more important) writers, carry large ornate books. Often large volumes are carried by Geetin who take the Rantaa' dictation. At their death, scribes take the writings and inscribe the Rantaa' words into massive stones placed inside a hex. The Rantaa' is entombed inside a hole drilled into the hex wall. A large plug is then inserted into the hole to seal the tomb. These Graveyards are often visited by Rantaa' and wealthy Kaloord. This is both to pay respects and to glean wisdom from the writings.

These grave yards are often beautifully adorned and are homes to great works of art. Because of this, these sites are hidden and only a few know their location.

Banner Stones

Banner stones are used as monuments to mark a Rantaa' territory. The larger and more ornate the stones the more powerful the Rantaa' family. Banner stones are all hand carved and are positioned in the middle of a hex. These towering stones are a principle art form in Kelrath society and say a great deal about the Kelrath. Ranging from three to ten meters tall, each stone is a unique work of art. Some announce the Rantaa's allegiance with an Oracle. Some will declare how the land it guards was aquired. Others have the Rantaa' family history or announce the greatness of a member of the Rantaa' family. There is a constant need to replace these stones because of battles with the Chezbah, or a rival family vandalizing them.

Science and Medicine

One of the primary distinctions of Kelrath medicine and science is that knowledge is a jealously guarded commodity. The last three hundred years of Earth's science and medical industries have been primarily about sharing knowledge. This difference between our cultures makes a big difference in the development of society. For instance, in Kelrath society the internet as we know it on earth could have never come about. Hospitals are nonexistent because doctors have to co-operate in a hospital. Kelrath doctors pass their knowledge down to two to three students that pay exorbitant fees to learn the master's secrets.

From some of our very early dealings with the Kelrath, we knew that they would not harm a doctor. This seems to stem from this brain trust that each doctor holds in Kelrath culture. Most doctors specialize in one or two fields of study. For one to die would potently put Kelrath medicine back a generation.

Kelrath Parties

The Kelrath live in a very structured society. Even their rivalries are carried out with strict customs. Kelrath festivity are always held indoors, preferably in the home of a friend. The host must provide enough alcohol for everyone. The Kelrath are forbidden by custom to drink anything but a drink called Metsoo.

Each guest is poured a drink. Each drink poured is approximately 400ml of strong liquor. Each drink is toasted, to an Oracle or to someone's health, what starts out as eloquent speeches, slowly degrades to garbled ranting. No one is allowed to drink before a toast, and no one is allowed not to after. If a more than a few drops are left after the toast, great offense is taken.

Parties are the time to settle grievances, as the night wears on, those that have a bone to pick, do so. As most of the participants are in a drunken stupor by the time this happens. The resulting argument ether ends up as a drinking match, or a fist fight. But anything said at a party, is a taboo subject afterwards, or until the next party. Any fights, or injuries cannot be brought up later (at least until the next party). It is a Kelrath saying, "If you forgot your problems at a party, they're not worth worrying about."

The pace of the drinking and the orderliness of the toasts is the only major difference between castes. Geetin and Gijorn often stand around a small table and have toast after toast, while Rantaa' and Kaloord toasts are punctuated by dancing, stories and grandiose proclamations. Often the person toasting is allowed a statement, before a toast, whether it is a marriage announcement, or a insult disguised as a joke. This is also a taboo discuss an insult after the party. By the same token, a toaster can bind a statement to secrecy with a toast. No one is allowed to speak of a matter bound to a toast unless it is to someone who was present at the toast.

Oracles

Kelrath Oracles are one of the most hotly contested subjects about the Kelrath. How many are there? What is their social function? Are the Oracles physical objects or simply ideas?

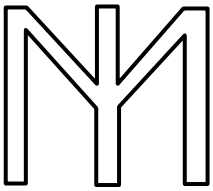
The Kelrath writings I have seen refer to the Oracles as counselors to the Rantaa'. Each one giving advice to the Rantaa' head. It is unusual that an the Rantaa' is the intermediary to the Oracle. In most cultures priests or shaman are the intermediaries and the governmental head seeks out the mystic to have questions answered. In the Kelrath culture the Rantaa' head is the intermediary and priests do the work of disseminating the Oracle's sayings to the people.

Oracles are not equal in the eyes of the Kelrath. Each one is accorded a certain amount of attention based on how interested people are in what they have to say. The most influential of the Oracles is Depta' "the Great Planner" and second is Rall "the War Master".

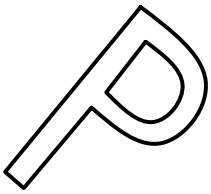
Among the least well known is Komook "the Historian" and Sha'duk "the Devourer"

The average city may have as few as two or as many as ten temples of various sizes that house the priests of an Oracle. These priests receive word from the Oracle's representative and spread the information to the people. Priests are of the Kaloord class. High level priests approach the local Rantaa' while the lowest level priests address the Geetin.

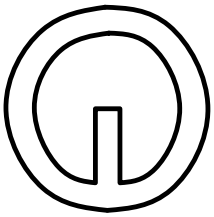
The following names of Oracles are known. There may be more that we have not been exposed to or their following may be too small to be widely known. Oracles are listed in order of how many followers they are estimated to have. Rantaa' often ascribe their allegiance to a single oracle, while lower castes seem to be less choosey. Geetin tend to try to give attention to a number of Oracles



1. Depta'-the Great Planner
Depta' is known primarily for his philosophy and his ability to plan for the long term. Depta' is revered as the primary guide in Kelrath life and temples in his honor are found in nearly every Kelrath city.

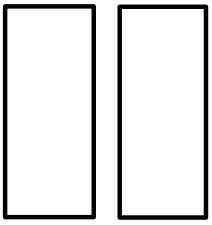


2. Rall-the War Master
Rall is renown for excellent battle strategy. Rall seems to favor a defensive position in battle, and this is reflected in the Kelrath weapons being designed to suit this.



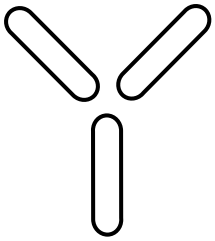
3. Kegre-Giver of Bounty
Kegre's advice is primarily agricultural in nature and as a result is most revered by Rantaa' that occupy the vegetation bands.

4. Kennis-the Master Builder *
Kennis is responsible for many of the building styles found in Kelrath cities including the restrictions put on the different classes in their building.

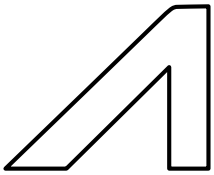


5. Tugen-the Old Thinker
Tugen is the repository for the sayings of the Tanroc Fredar. As such Tugen serves as the Constitution of the Kelrath people.

6. Sessa-(title unknown)
Little is known about Sessa at this time except that he may be associated with funeral rites. Aside from this Temples to Sessa are relatively common and many give their support to this Oracle, but little else is known.

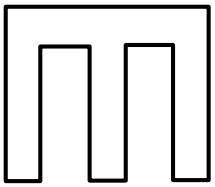


7. Dari-Peace
Dari encourages forgoing aggression and ambition and focusing on the staples of Kelrath life.

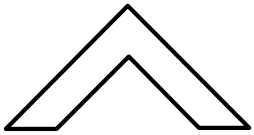


8. Pho'duk-the Destroyer
Po'duk is similar to Rall in that he gives advice about war. However Po'duk is more aggressive in his tactics. Followers of Po'duk are known

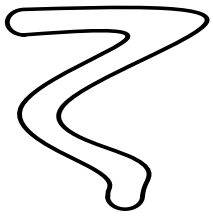
for aggressively attacking both the Chezbah and the Scimrahn.



9. Rugen-Justice *
Somewhat equivalent to the Kelrath supreme court, Rugen is the judge of matters considered intrinsic to the future of the Kelrath.

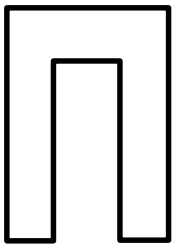


110. Fra'duk-the Champion *
Fra'duk is a bit anomalous as far as Oracles go. Every five months, Fra'duk chooses a champion for a random cause; be it medicine, science, art, war, etc. His champion then is aided by Fra'duk and his followers to advance the cause.



11. Kress-the Reveler
Kress is observed for keeping special occasions for revelries. The Kress representative announces when to have parties and special observances. Kress is also the primary Oracle for entertainers.

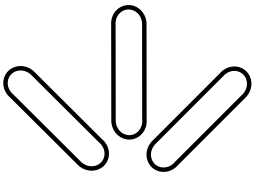
12. Detoon-the Artist
Detoon is the primary Oracle for artists and artisans. The Detoon representative recognizes the greatest artists and artisans and gives advice and guidelines. A large portion of his advice is in the carving of banner stones.



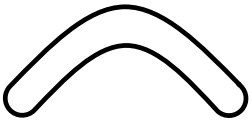
13. Gate-the Beast Trainer
Followers of Gate are the best at animal husbandry among the Kelrath. Those who deal with livestock or using animals for labor, look to Gate for direction.

14. Famal-the Teacher
Famal is primarily known for Schools and more frequently in Kelrath culture, guilds and apprenticeships.

15. Komook-the Historian
Very little is known about Komook. It seems that his name is not widely mentioned.



16. Sha'duk-the Devourer
Sha'duk resembles many other culture's gods of death and destruction. Sha'duk has a limited following.



17. Matin- the Redeemer
Although mentioned in a few texts there have been no reported temples to Matin. As a result few are familiar with him.

Communications Officer's Guide

Communications officers are vital in the ASO's and I-CA's operation on the battlefield. Early 21st century warfare showed that an army with proper logistics support was able to out maneuver the enemy and allowed unprecedented flexibility for small special operations units.

Ancient warfare consisted primarily of the fighting soldier. There were very few that were in charge of organization, logistics and strategy.

The philosophy that has proven effective ever since the information age began is, by giving support to a solder he or she can be more effective than a more numerous foe. This is the function of the Communications Officer, to be the channel and the dissemination point for this support.

The Artifact has proven troublesome to this philosophy however, as Earth forces have grown reliant on satellites for global positioning and communication. But satellites cannot penetrate the vast underground, and both the Chezbah and the Kelrath operate their own orbital defense fleets that make the use of communications satellites impossible. Earth forces must now rely on an increased investment in manpower to maintain the level of communication that is required to operate a modern army, as they are accustomed.

Communication officers give the unit the ability to call for aid when needed and in some cases serve as a conduit for that aid. Both the ASO and the I-CA allow a unit to work with experts in a number of fields. The communications officer is the proxy for the expert. He or she is trained to work with these experts and communicate effectively with them. In essence, the Communications Officer becomes the expert.

A communication officer's role in the modern battlefield is more than mere radio communication. As shown in W.W.II when the English broke the Germans enigma encryption, it turned the tide in the battle against a technically superior opponent. A Communication officer who can crack his opponent's codes can enable his unit to anticipate the enemy's movements and tactics before they occur. He or she must also prevent the same from happening to his unit.

Quantum Liquid Computers (QLC) have made a task that once took weeks and teams of code crackers, a task that a single resourceful officer can accomplish in a matter of hours.

The Mission

The Communications Officer's mission consists of four primary tasks. First enable the forces they are attached with to communicate between themselves, natives and base. Second to be the eyes and ears of the forces they are attached to using sensors and computer data. Third, to use the equipment available to protect the forces they are attached to. Fourth, degrade the enemies ability to attack by defeating security systems and countermeasures.

Communication

Without communication, forces cannot be coordinated, reinforcements cannot be called on, and forces are separated from their commanders. This severely limits the effectiveness of special forces groups and would force a return to armies of brute numbers as the Kelrath use. This is not an option for the numerically inferior Earth forces who must make the most out of every man and woman available.

In game terms this means that the Communications officer that is able to contact their commanders can receive aid from specialists that are not part of their immediate force. Officers can give updated commands and advice. Reinforcements and air support (if available) can be called on. Scientists can be consulted for technical issues. Scimrahn can give advice on survival and cultural issues. On occasion, Kelrath that have entered Scimrahn society can serve as translators.

The Communications Officer's primary job is to enable the allied forces to communicate freely and safely. There are several aspects to this mission. First, the soldiers the Comm Officer is attached to need to communicate safely with each other. This means setting up encryptions and signal scrambling protocols. Second, connecting units to resources such as calling for reinforcements or getting expert advice. Third, units must be able to communicate with command structures to get operational instructions. Fourth, translate for attached forces where possible.

Scrambling Signals

The Communications Officer is responsible for establishing and maintaining a secure radio channel via a frequency hopping spread spectrum (FHSS) broadcast along with adequate encryption.

FHSS is a method of preventing a radio broadcast from being intercepted. The Transmission frequency of a signal is rapidly altered at a set interval of time. This is called the signal hop. An eavesdropper only hears a series of chirps that are unintelligible because only a tiny portion of the transmission is received. The hop sequence is predetermined allowing the recipient to get the entire broadcast.

The Chezbah and the Kelrath do not use FHSS to scramble their signal and instead rely on heavy encryption for security.

Chezbah priests are able to patch together the hopping sequence with very short periods of exposure (1-2 minutes) but priests are not always embedded along with Chezbah forces.

The Kelrath have constructed special Kerdi that can pick up the hopping sequence and transmit it back to a handler but require approximately fifteen minutes to pick up the sequence.

At all times include as little information as possible while still clearly communicating to the recipient. Code words can prevent a message from being understood.

When there is a high probability that there are enemy forces present and stealth is preferable, radio silence should be maintained. Laser communications are more effective in these situations because they are difficult to detect, and even more difficult to intercept but requires a clear line of site between the sender and receiver.

It is the function of encryption to prevent or delay the enemy from understanding a message sent. Encryption does not increase the amount of data being transmitted significantly, but does make the processor in a communicator or computer work harder. Strong encryption will prevent real time communication, as the processor must work harder.

The standing command to Communication Officers is to reduce the processor load on the command site. To do this, there are three grades of encryption, weak, average and strong.

Weak encryption

Weak encryption is useful for sending messages that the Chezbah will not see as threatening and holds no tactical data. Progress reports that hold no tactical data are good examples of this.

Weak encryption usually is cracked in a matter of an hour. This can however be enough to allow a unit to get far enough away from the transmission site.

Transmissions of the nature described above are rarely bothered with (-20 from the likelihood of the Chezbah immediately investigating). It is even sometimes preferable

to use a weak encryption to make a transmission look like it is unimportant.

Weak encryption has 200 BP for it's encryption strength.

Average Encryption

Average encryption is used in non-critical transmissions that hold some tactical or sensitive data. Any transmission that mentions the Scimrahn should be sent with at least average encryption. Progress reports that contain troop locations or movement should be sent with average encryption.

Average encryption has 500 BP for it's encryption strength.

Strong Encryption

Strong encryption is very processor intensive. Even computers with the key to the encryption take several seconds to minutes to decrypt the message based on processor load. Any transmissions of tactical importance or information on the whereabouts of Scimrahn settlements should be sent with strong encryption.

The Chezbah are very good at cracking encryption. Even 3840 bit encryption does not seem to phase their code cracking ability. Only encryption with key codes in excess of 245760 bits will result in a significant delay in their code cracking.

Strong encryption encryption has 600 BP or more for it's encryption strength.

Reinforcements

When allied forces are pinned down or a mission objective is in jeopardy, it may be possible that reinforcements from the local area can be called in to assist. These forces may take time to arrive unless the base has access to fast moving vehicles such as Vanguard Helicopters or Scimrahn Deltas.

The GM should determine what resources are available for reinforcement. It may be preferable to have the reinforcements available in the area considered before the game begins. If a base has access to a teleporter a Vanguard or Delta may be teleported in, dependent on where the engineering crew are in the teleporter cycle. Roll 1d10, on a roll of one (1) or two (2) a vehicle can be made available in fifteen minutes (not counting travel from base to the destination). For rolls between three and ten (3-0) multiply the number by one hour for a time of availability (again not including travel time).

Unless the characters are on a covert mission or resources for their base of operation is stretched very thin, a competent commanding officer will have reinforcements lined up.

Expert Advice

When a Comm Officer communicates back to base, they are able to ask for help from experts on a huge range of subjects. A Comm Officer that contacts their base gets the equivalent of any one IQ skill at +30 or any one Dex Skill at +8 for the time that the connection is open. This help requires the use of a network connection or a wormhole communicator. (See: Page 70 The Artifact RPG, Communicating Through the Network)

Tactical Support

By contacting command, the Comm Officer can get updated tactical information. This is especially useful when there are multiple groups in the same region that can contribute status reports. One of the most important benefits in getting updated tactical information is avoiding friendly fire incidents.

Resupply

Although most groups are sent out with a standard set of supplies, if a mission requires more equipment, command will almost always provide it if it's available. The Comm Officer can request a resupply when needed. At times this may mean the supplies are delivered to the forces in need but if the area they are in is considered dangerous, they may need to fall back to a point where supply personnel can get to them safely.

Translation

Comm Officers are expected to be available to translate for friendly forces.

When translating a character, unless it is the translator's native language they must take a roll on their Speak skill for the language being spoken. Then the player rolls on the character's Speak skill for the language that is being translated to. No skill check is required for native languages.

Observation

The Comm Officer can patch into sensor feeds from allied forces and examine them from a HUD. This gives another chance to examine sensor information and the Comm Officer can run comparisons of sensor data that combine weak signals to form a stronger signal. New communicator firmware is also allowing Comm Officers to pool data from static and noise in the CCC conductivity of a Hex and process that information to look for movement in the Hex in a process called Conduction Mapping.

Sensor Inferometry

The Comm Officer can use software built into their communication computer (ASO L.R.C.T.R.S.D. or ICA Heavy T/R/S/D) that combines the input of different sensors from vehicles to enhance sensor information.

Inferometry is a technique where data is compared from multiple sources and then missing data can be inferred giving a clearer picture.

By using this software the Comm Officer can make Sensor Skill rolls to detect targets and gets a +5 to the skill for every vehicle supplying sensor data.

Conduction Mapping

The Scimrahn know that Hosent can feel through the ground around them and that large numbers of powered Hosent can feel into their surrounding Hexes by comparing what they pick up from the ground. The Scimrahn felt that the processor power needed to copy this long range effect was too high to make portable systems that could copy it. Some prototypes exist but they require large vehicles to move them. This was considered a dead end science and the Scimrahn will ask the Hosent what they feel around them since most industry tribes use powered Hosent. Relying on Hosent has it's limits as power is not always available and the Hosent may betray Scimrahn to the Chezbah.

The Scimrahn have also suspected that Chezbah Priests also use a similar process to detect movement in a Hex and Kelecs confirm that they are able to use Conduction Mapping.

The Hosent create a map of the conductivity of the CCC around them and measure noise transmitted through the CCC that comes off plasma mains and the static that builds from quakes. By reverse engineering the Hosent's ability to map the conductivity of CCC and using algorithms that were developed to decipher patterns in the cosmic microwave background, Earth forces have released firmware patches that enable their communicators to create their own maps. A minimum of five communicators are required and the Comm Officer's communication computer (ASO L.R.C.T.R.S.D. or ICA Heavy T/R/S/D) to compare the individual readings to form a map.

Conduction Mapping generally registers force on CCC so the faster or heavier something is, the more force it generates on the CCC. Wheeled vehicles produce less impact force than a running E-Suit but can build up static that may become detectable. AG vehicles do not exert force on the CCC but their engines can produce weak signals that will travel through the CCC but are still relatively stealthy.

An individual human is usually too small to detect but dozens of humans will show up as a diffuse signal.

Conduction Mapping will give a reading of all forces on every floor or surface of a Hex. Readings may indicate quake forces building and can give phantom readings. Cracks in the CCC of a hex can block the mapping process and make some segments of a hex effectively invisible to the process. Moving to the area that is cut off and repeating the mapping will allow that section to be checked.

Hosent Conduction Mapping

Powered Hosent that know how to make a CCC conduction map can be asked for information on what they have felt moving around. Because there are usually a large number of Hosent in a hex they have a 5% chance for every 150 kg to notice an object or group of objects within one hex away from them. For every 10 Km/h the object is moving they get a +5% to detect the object or group of objects. AG vehicles are -30% to detect and wheeled vehicles are -10%.

Some Hosent have not learned how to do this (20% chance) and have to be taught how to perform conduction mapping. A

Physics Skill roll and then a Computer Programming roll is required to teach them how.

Comm Officer Conduction Mapping

A Communications Officer must have at least five communicators touching the CCC of a Hex at once to pool data from and form a map. The Comm Officer rolls against their Sensor skill to interpret the data.

Objects or groups of objects of around 10,000 Kg are baseline difficulty for detecting. For every 1000 Kg less than that is -10 to the Sensor Skill. For every 5 more communicators supplying input and processing power there is a +5 to the sensor skill roll. Every 1000 Kg more is +10 to the Sensor Skill. For every 10 Km/h the object or group of objects is moving there is a +5 to the sensor skill roll. AG vehicles are -30 to detect and wheeled vehicles are -10.

Remote Processing

The Comm Officer can send readings to a computing center back at base and have the data analyzed. To do so they must communicate back to a base through The Artifact's network (see pg 70 of The Artifact RPG).

Remote processing takes ten minutes and has a 5% chance for every 100 kg to notice an object or group of objects within one hex away from the original reading. For every 10 Km/h the object is moving they get a +5% to detect the object or group of objects. AG vehicles are -30% to detect and wheeled vehicles are -10%.

If the Chezbah are using Conduction Mapping, then use the Remote Processing rules to determine success.

Protection

The Communications Officer's role includes monitoring electronic systems to make sure they are not being infiltrated by enemy attacks.

Most pilots do not the training to protect themselves from computer based attacks. The Communications Officer's responsibility is to monitor the systems on the battlefield and prevent intrusion.

Pilots can also be too busy with combat to use ECMs and ECCMs. The Communications Officer helps by monitoring countermeasures, activating them, and tuning them remotely.

Countermeasure Assistance

Comm Officers can remotely operate a vehicle's ECMs and ECCMs to help protect friendly forces. This can be in addition to the pilot's ECM skill roll or the Comm Officer can operate the equipment even if the pilot does not have the skill needed.

Even if a pilot has the skills to use their ECMs and ECCMs, the Comm Officer can monitor their systems and make corrections when needed. In game terms this means that the Comm Officer can re-roll failed ECM and ECCM rolls.

Changing Codes

If an enemy is anticipating troop movements and especially if the security of friendly systems are being hacked, the first step to take is to change the codes being used to encrypt radio signals. This requires a Scrambler skill roll to set another encryption scheme.

If security is still being compromised after changing codes, the hacker may not be using radio as their intrusion method or they may have fully compromised a system and set up a backdoor.

Chezbah Hex Mainframe Virus

It does not appear that the Chezbah used viruses before the arrival of Earth forces so these nasty bugs are brand new. The Chezbah most likely picked up the idea from Earthers, possibly from reverse engineering an antivirus program on a captured Personal Computer. The Chezbah plant these viruses in Hex Mainframes at random. They realize that any one type of virus would be easily defended against and so place different viruses in systems they think an enemy is likely to connect to. Hex Mainframes have not been flooded with these viruses as it would appear they could be. This may be an attempt to lull network users into a sense of complacency.

Although these viruses are found in Hex Mainframes some Chezbah Priests have

been known to infect systems with viruses like these.

The GM may place viruses in specific Hex Mainframes or roll randomly to determine if there is a virus. There is a 10% chance (roll a 10 or under on a 1d100) that any one Hex Mainframe is infected with a virus that has not been patched for yet.

While some Chezbah viruses can attack multiple systems, most are tailored to one specific kind of computer. For instance, many viruses are designed to attack the Scimrahn Comm/Comp while others are designed to attack Earth made Personal Computers or their communicators.

Roll on the table below to see what computer system a virus is intended for.

Roll 1d10

1-4	Scimrahn Comm/Comp
5-6	ASO Communicators
7-8	I-CA Communicators
9	Personal Computer
10	TF-2394

These viruses are startlingly effective but so far lack the abundance of different types of viruses that Earth's Internet has. As a result, when a new virus emerges it can seriously compromise a system but once contained and examined an Anti-virus, system patch or firmware patch can be created for it. This has become a priority for ASO forces to repair these gaps in security but has also become a learning experience because the powerfully efficient programming of Chezbah viruses.

This has lead most Communications Officers to use a virtual system to connect to mainframes and then when infected freeze the system and store it for later analysis. As soon as a virus is detected the system must be frozen because some viruses have been able to break through the virtual system and into other systems on a computer but early detection is not always possible.

Typical Chezbah Virus
Defeat Security Rating: 55
Barrier Points: 180
Self Propagating: Yes
Detection Modifier -60

Effect Table
Roll 1D6

1	Kill Virus
2-4	Code Stealer
5-6	Backdoor

Monitoring for Intrusion

The Communications Officer can monitor communications and watch for enemy intrusion attacks.

The Communications Officer can check how many Barrier Points a system has by making a Computer Operation skill check. Each check takes one action.

If the Barrier Points of a system are low, they can rebuild them with a Computer Programming skill check A roll on the Full Fraction Column restores one (1) BP. Rolling under the Half Column restores two (2) BP, the Quarter Column restores four (4) and an Eighth roll restores eight (8)

Hacking

The Communications Officer is trained to degrade the effectiveness of enemy forces. This process is referred to as hacking for computer systems or cracking for codes.

The Communications Officer is not the only type of character that can use these methods. Other characters with the needed skills can also perform these actions, which can include enemy NPCs, most notably the Chezbah Priest. Because of this, the person intruding on a system here are usually referred to as 'the hacker' where the person that normally operates a system as 'the user' or 'the pilot' for vehicles.

Hacking is not usually a quick process. Because of this a Communications Officer must be prepared ahead of time with the tools and have a plan in place for how they will accomplish their tasks.

Intrusion Methods

The first challenge of hacking a computer system is to communicate with it. For systems like Hex Mainframes and Hosent, a terminal connection anywhere in a Hex is all that is needed. For vehicles, it is more difficult to connect to their computers.

For any intrusion method there is a limit to how much the hacker can send and receive from the target system because of the

connection's bandwidth. Because of this there is a limit to how many Barrier Points can be broken down per turn.

Network

Any system connected to The Artifact's communication network can have that connection used as an intrusion method. The only protection for these systems is to disconnect them from the network or through their Barrier Points, if any. Hosent and Hex Mainframes are not considered to have Barrier Points because they are not designed with user control systems.
Barrier Point Limit: 500

Radio

It is possible to connect to an enemy's systems via radio communications but military vehicles will only accept data connections from a signal carrying a encryption that it recognizes. In other words, first the enemy's signal encryption must be cracked and then the hacker can start reducing Barrier Points to their computer systems. This usually requires a large investment in time or computer processing power most often accomplished by employing a Hosent Hive Virus (See: Page 36 Hosent Hive Virus).

If an enemy realizes they are being hacked over radio, they may change their signal encryption or shut down their radios to prevent this type of attack.
Barrier Point Limit: 50

Magnetic Gun

A plasma gun can be modified to only fire a magnetic field at a target. That magnetic field induces a signal in the vehicle's electronics and can be used to create a communication path. Modifying a plasma gun to do this requires an Electronics Repair Skill roll, proper tools (as found in the Deluxe Tool Kit) and a computer to send and receive from. The process takes a half hour to complete but the gun can continue to be used for this purpose. Damaged plasma guns already recycled for this purpose can usually be acquired from most Scimrahn tribes for half the cost of a regular plasma gun.

Range class modifiers apply to all rolls using this communication bridge because the magnetic field gets weaker over distances. Active force fields prevent the magnetic field from reaching a target and are an effective countermeasure to this type of attack. However this kind of attack is difficult to detect (Sensor Skill -20) and may not be noticed by a vehicle pilot until their computer's are compromised.

Aiming and operating the magnetic gun usually is done by two people. One to keep the gun aimed at the target and another to defeat the target's security systems.
Barrier Point Limit: 100

Radio Tags

Used on vehicles and robots not from Earth, these are small radio receivers with adhesive pads that are placed on a vehicle, thrown onto a vehicle or more recently some have been designed to launch from an AVW or grenade launcher. The tag communicates through the vehicle's skin which is designed to carry data for damage control systems and communications and offers a path to a vehicle's control systems.

The tag has a range class of C to communicate and range class modifiers apply to any rolls made over this type of connection.
Barrier Point Limit: 75

Sticky Tag
Cost: ¥300

Tag Grenade (for Grenade Launcher)
Blast Range Class: A
Cost: ¥6,000

Tag Missile (for AVW)
Blast Range Class: B
Cost: ¥20,000

Advanced Hacking Rules

Barrier Points listed for vehicles and computer based systems are intended to simulate the effort that is needed to fully compromise a system. Once a character has reduced the barrier points to zero they have full control of the system and can in effectively lock out other users. However, this process is slow and not practical for most combat situations.

A hacker does not have to completely compromise a system to have a meaningful effect on it. A hacker can attempt to get only partial control of a system. This may be used to degrade it's abilities or possibly to shut down systems for a short period of time.

Time

In non-combat rounds the GM may allow longer turns to occur. This increases the

number of Barrier Points the hacker can reduce per turn.

For a 100 second turn (approx. 1 1/2 minutes), a roll on the Full Fraction Column reduces ten (10) Barrier Points. A roll under the Half Column reduces twenty (20), the Quarter Column reduces forty (40) and the Eighth Column reduces eighty (80).

For a 1000 second turn (approx. 15 minutes), a roll on the Full Fraction Column reduces one hundred (100) Barrier Points. A roll under the Half Column reduces two hundred (200), the Quarter Column reduces four hundred (400) and the Eighth Column reduces eight hundred (800).

Limited Control

Instead of trying to get full control of a computer system, a hacker can attempt to get limited access to the computer. This can be useful if at the right moment, a hacker brings down the shields of a vehicle. Nothing would prevent the pilot from reactivating them after the attack has been made but it would give friendly forces the advantage. Another useful example is disabling communications when a enemy may try to call for help, they may not recognize that their requests are not being transmitted right away.

To gain limited control of a system the hacker must reduce the barrier points of a system 30%. They can continue to reduce the barrier points of the system from that point to try and gain full control of it.

A hacker with limited control can operate as though they were a regular user of the system but cannot damage a system or do anything that cannot be reversed by regular operator. Anyone with the Program Computer skill can restore Barrier points to the system. If the Barrier Points go back up over the 30% taken down, the hacker is ejected from the system until they can reduce the Barrier Points 30% again.

If a hacker and a pilot are struggling for control of a vehicle, the hacker rolls against their Computer Operation skill and the pilots roll against their piloting skill and the character with the lowest fraction column result controls the vehicle that turn, the pilot wins a tie of the fraction columns.

Hacking a Vehicle's Systems

When hacking a vehicle's system the hacker may not need to get control of the computers that control it. In fact the vehicle may not need to be computer controlled. The Hacker is trying to exploit flaws in electronics or computer systems to degrade the performance of those systems. For example, a radar on a vehicle may not be computer controlled and thus have no Barrier Points listed but it may be hacked and disabled, under the right circumstances.

When attempting such an exploit, the hacker is often operating blindly. They may not know what system they will be affecting or even what effect the exploit will have. Once the hacker has reduced enough Barrier Points, they roll on the vehicle's critical hits to determine which system is disabled and follow the critical hit effects with the exception of any pilots or crew being killed. If the hacker gets a bridge or cockpit hit then the controls of the vehicle are disabled.

If the pilot makes a successful piloting skill roll, they can bring the system back on line but this takes an action.

Computer Controlled Vehicles

To hack a computer controlled vehicle's systems, the hacker only has to defeat 10% of the system's Barrier Points. The Barrier Points reduced in this attack cannot be used to further compromise the vehicle's computers and to make another attack the hacker must reduce another 10% of the vehicle's Barrier Points.

Electronic Systems

Hacking electronics on a vehicle is usually slightly harder than a computer controlled vehicle. Only a magnetic gun can be used as an intrusion method for this kind of attack. These systems have the equivalent of 1d6x10 Barrier Points. This roll should be taken in secret by the GM.

Programming and Distributing Viruses

A virus is designed to breach a system's security and carry out actions the programmer designates referred to as the payload. The first stage of a virus' attack is to establish a foothold on the system. In this phase the virus embeds itself into the computer's system. The second stage is where the virus chips away at the system's security. Once Security is breached, the virus will either set up it's own defenses to prevent itself from being removed or it can deliver it's payload.

Self Propagation

A virus can be designed to spread itself to similar systems. Whenever the system it is embedded it contacts another computer

of the same type it can attempt to infect the new system even if it is only to the foothold stage. Each new system infected follows the same rules as the initial infection.

Designing a virus to self propagate requires a successful Computer Programming skill roll and added programming time of four hours.

Defeat Security Rating

All viruses have a Defeat Security Rating (DSR) that say how many barrier points they can defeat in ten minutes. This rating is programmed into the virus and can only be as high as the programmer's Defeat Security skill. It takes two hours and a successful Computer Programming skill roll to program every point of Defeat Security Rating. A Half fraction column roll on Computer Programming gives the virus two (2) more points on it's rating. A Quarter roll gives the virus four points and a Eighth roll gives eight (8) points. A failure doesn't mean that what was programmed before was lost, just the hour spent programming.

A virus breaks down one (1) Barrier Point for every point of DSR every ten minutes it is attacking the system.

Protection

Once embedded into the system a virus can protect itself from removal. This may not be necessary if the virus is not noticed but it is advisable if the virus is going to remain on the system for an extended period of time.

The Virus can be programmed with one Barrier Point for every hour and a successful Computer Programming skill roll. A Half fraction column roll on Computer Programming gives the virus two (2) more points on it's rating. A Quarter roll gives the virus four points and a Eighth roll gives eight (8) points.

Detection

It is the goal of any virus to remain undetected until it has delivered it's payload. However the more capable the virus, the harder it is to hide. Because of this a balance must be struck between the virus' ability to do it's job and it's size and effects on the system.

Add the virus' Defeat Security Rating and Barrier Points together, plus ten for every action it's payload is to take, plus ten if the virus is carrying any programs, plus ten if it is self propagating. Now subtract the table results of the computer programming skill roll. The result is the modifier to detect the computer user has to find the virus.

Roll For Computer Programming skill

Fail	Full	Half	Quarter	Eighth
40	90	100	120	140

Detection Modifier = Defeat Security Rating + Barrier Points + 10 for each action + 10 for each program (if any) + 10 if self propagating - Table Result

Step 1: Foothold

The virus must get access to some of the system's memory and to the processor in order to infect a computer. To do this it does not have to get full control of a computer. The hacker or the virus must breach 10% of the system's Barrier Points in order for the virus to embed.

Every turn the virus is attacking the system users can take a Computer Operation skill minus the detection modifier to locate the virus. At this stage, if the virus is caught, all that is needed to remove it is a successful Computer Operation skill roll.

Step 2: Breaching Security

A virus can be designed to get limited control of a system or to get full control (See: Advanced Hacking). Limited control is faster but whatever actions the virus takes can be countered by an alert user. Full Control can lock out legitimate users from the system or at least prevent them from canceling it's actions. Locking user out alerts them that the virus is a problem so is not usually the best action to take. At this point the virus establishes it's own barrier points if any that must be defeated to remove it.

A user can try to find a virus while in this stage every ten minutes by rolling for their Computer Operation skill minus the detection modifier.

Step 3: Payload

At this step the virus can deliver it's "Payload". This is a part of the program that carries out an action. This action can be the creation of a back door (See: Backdoor) for the hacker to use later, to issue commands, run a program or damage the system. The virus can send any command that a regular user can. If the virus has full control it can start erasing programs usually starting with vital operating instructions first. If the virus contains a program, it can run that program.

Every turn the virus is attacking the system users on the system can take a Computer Operation skill minus the detection modifier.

Removing a Virus

Once a virus' Barrier Points are reduced to zero all copies of it can be removed with a successful Computer Operation skill roll. A Computer Operation skill roll must be made for each system infected.

Virus Lifespan

Once a virus has been located, it is only a matter of time before a countermeasure is designed for it. For the Kelrath Scimrahn I-CA or ASO, this process may take several days. Roll 1D10 x 12 hours. For the Chezbah Roll 1D10 x 1 hour. After this point the virus only has a chance to infect unprotected systems and it's Barrier Points are only 10% of what they were. There is a 10% chance that a system is unprotected. The Hacker can try the virus on the system to see if it can get a foothold, even if the virus will fail, users will have a chance to detect the virus.

Backdoor

Once a system is compromised the hacker can install a backdoor so the system can be accessed more easily in the future. This is most often done by delivering a virus to a system that then creates a backdoor for the hacker to use later.

A backdoor requires a system's BP to be reduced to zero either by the hacker or by a virus. Then the hacker must make a successful Computer Programming skill roll.

A Backdoor once installed is usually difficult to detect unless it is widely used or known about. A backdoor used once can be detected by a Computer Operation skill roll but has a -50 to the skill. Every other time that same back door is used, there is a +10 for it to be detected. This means that a backdoor used twice has a -40 to be detected, three times -30 etc.

Trojan Viruses

A hacker can embed a virus in their encrypted communications. The reason for doing this is to infect the system that is used to decrypt the message.

The operator of the system must roll for virus detection to notice that a virus has been delivered to the system.

Hosent Hive Virus

While some scientists have used Hosent Hives to run calculations and simulations the Hosent Hive is most commonly used to attack large numbers of computerized vehicles. The Hive runs software that is equivalent to the Defeat Security or Code Cracking skill but on a massive scale. The Hive can crack between 1950 and 4,425 barrier points a turn. This is far more than enough to nearly instantly crack any encryption or breach the security of any known security system.

Every Hosent has a massive QLC that can be repurposed to perform computing tasks. Comm Officers have written viruses that take over the QLC and allow them to run programs designated by the Comm Officer. The Virus propagates itself to all the Hosent in a Hex and every infected Hosent spreads the virus to more Hosent. This allows the Comm Officer to run programs on what is in effect a massively parallel supercomputer. There are 26,496 Hosent in a Hex. Each has 383 processor points for a total of 10,147,968 processor points. Unfortunately only about 5% of that is unused and available, it takes eight hours to get a Hosent to erase all of it's instructions which is usually too long for Communications Officers in the field, so any commands must leave the Hosent AI intact. It's also likely that 10-60% of Hosent in a powered hex no longer function (roll 1d6 x 10 for the percentage). That means that between 450,000 and 200,000 processor points can quickly be repurposed for the Comm Officer's use per hex (500,000 x percent of Hosent functioning).

The Hosent Hive Virus usually carries a program as it’s payload such as a Code Cracking or Defeat Security software. Since the hive is so powerful the hive’s DSR and CCR are how many Barrier Points the hive can defeat per turn instead of every ten minutes.

Number of Functioning Hosent
Roll 1D6

	Hosent Functioning	Processor Points	DSR per turn	CCR per turn
1	23,900	457,700	4,577	7,628
2	21,200	406,000	3,562	6,766
3	18,600	356,200	3,562	5,936
4	15,900	304,500	3,045	5,075
5	13,300	254,700	2,547	4,245
6	10,600	203,000	2,030	3,383

It takes time for the Hosent virus to spread. Each Hosent takes about a minute for the virus to take effect. It then infects five others, now six are infected. In the next minute those six each infect five more Hosent each for thirty six infected. In the following minutes 216, then 1296, 7776, until finally all the Hosent in the Hex are infected. The process takes only about seven minutes.

Chezbah Reaction to Hosent Hives

Whenever a hive is left connected to The Artifact's network for 2d10 minutes it is attacked and dismantled from the prime addresses and from different locations all over the network. It is thought that the attacks from different directions are Chezbah priests but the system at the prime addresses is extraordinarily powerful. In 1D6 turns the entire Hex of Hosent are commanded with instructions that erase key components of their AI and cause all of them to crash.

Stealing A Hive

Hosent have very little system security and are easily compromised. This makes the virus easy to use but also makes the virus easy to repurpose by another hacker.

The Hive Virus has a minimal amount of security itself which is represented as Barrier Points. Once those Barrier Points are depleted the hacker can use limited control on the entire hive (There is no way to get Full Control because there is no way to lock users out of the Hosent).
Barrier Points: 60

Hosent are Intelligent

Hosent themselves can at times realize what the Defeat Security programs can do and will begin to use them for themselves. Although each individual Hosent is not very intelligent, they do communicate with each other and as a group they can slowly figure out how to use the virus.

In the first ten minutes of the virus being used, there is a 5% chance that the Hosent will gain control of the virus. Each hour after that there is a 30% chance that the Hosent will take control. The massive processing power of the Hosent make it very difficult to prevent this from happening but the Hosent can be distracted by a character keeping them busy by having a conversation with them. A successful Charisma or Storytelling skill roll must be made each hour to keep them distracted.

Remote Hives - The ASO and I-CA along with some corporations have set up hidden Hosent hives that can be called on to perform Defeat Security or Code Cracking attacks. To use these hives the PC must know how to contact them and be allowed access to the system. This information would be provided to them at the start of a mission. However these systems are usually in use and so are not wholly devoted to the character's request.

The PC must connect to these locations over the network and must keep the connection open. Each turn the connection remains open the Hive can take down 2D6x10 Barrier Points in a target system.

The Network

The Artifact network is the single most powerful communication system available to Communications Officers. Using it is dangerous. Not using it means isolation, and vulnerability. Other methods of communication are useful for short distances but fail to satisfy the needs of a modern army.

A single mainframe QLC manages each hex, and the mainframe in the power hex manages the incremental city. Each hex has roughly one hundred to several thousand terminals dependent on what type of hex it is. Plasma conduits carry inter-city communications.

1. The Artifact QLC mainframes use a four quibit structure similar to the numbering system used by the inhabitants of The Artifact. Because of this, Computers made on Earth need to run special emulation and translation programs in order to communicate on The Artifact's network. There are many versions of these programs and they are often freely available.

2. Each hex mainframe has what is translated to an eight byte address (for example 00.30.FC.00.45.6C.E2.3E) to designate where the hex is in The Artifact. This address is in hexadecimal (where 0-9 are treated as

normal, but A-F are counted as 10-16. The first two octets (the first four digits) is the number of the plasma conduit the hex is fed from. Some Communications officers have compiled databases of plasma conduits and programs that translate a mainframe's address into a location in The Artifact.

3. The Prime Addresses are the first one through eight addresses on The Artifact (00.00.00.00.00.00.00.01 to 00.00.00.00.00.00.00.08). A bulk of the communications that the Chezbah generate is sent to or from these addresses. Locating these systems is problematic because they do not conform to the standard addressing scheme that all hex mainframes conform to. Because all transmissions to these addresses are routed up to plasma conduits, it is assumed that these addresses are somewhere in the collector wells or in the industry pods. Security for these addresses is seemingly impenetrable all attempts to crack into these addresses has been unsuccessful.

6. Data links between QLCs can carry 128Kilobits per second. This rate is barely adequate for the demands of most network applications that are used on the Internet on Earth. Old programs that had not been used in over fifty years have been dusted of and adapted to The Artifact's data network.

7. Data links that run along the plasma conduits can have a throughput of 145 Megabits per second. This capacity is used to about a third of its capacity by status reports sent by Hosent and the mainframe QLCs. While the transport capacity of these lines is much more accommodating, the Chezbah monitor them more closely. Because of this most communications officers avoid using them.

8. Routing of messages is not as dynamic as the networks that Earth uses. The Internet on Earth is designed to be failure transparent. If a single link in the transport chain is broken the network quickly reacts to the loss of connectivity. On The Artifact, the network is static and all the data paths are known. QLCs do not react very fast to failures. The system will recognize that a failure occurred, but will continue to attempt to use the data path that it is programmed to use. Only after a lengthy failure (over fifteen minutes) will the QLCs try and find a path around a failure.

9. Security on QLCs is almost non-existent there are a few commands that cannot be run from regular terminals or externally, such as wiping the QLC and bringing down ports. There is also no file structure on the QLC. All files are stored in a "soup" without any structure. This can make it difficult to find a specific file or program.

QLC Commands

These are commands that can be run from on a QLC emulator, some can be used directly from a terminal to a Hex Mainframe QLC. Entering commands to a terminal requires the user to have the Read/Write Chezbah skill. Scimrahn Comm/Comps can execute these commands by speaking Scimrahn.

call (Network address)
Connects to a Hex Mainframe from anywhere on the network with a temporary terminal id. This connection acts as if the user was in front of one of the Hexes terminals. The command, call -b ends the call command.

call -s
This call command searches for working Hex Mainframes in a range of addresses and returns a list. This is a powerful command that can be used to find powered hexes in a large region.

find (Criteria)
Only available on QLC emulators. Finds files or programs based on size or type.

kill
Stops a program or process on the QLC.

poll
Checks the status of equipment in the Hex. Will return a long list of responses from devices such as terminals, Hosent, air pumps, water pumps, filtration pyramids, light panels, electrical and communication lines. Gives a status of the device as on, off or in error (usually if the device does not respond). Also returns the device id and terminal id (if applicable). When attempting to establish a base camp it is good to know if there is local power available. By using the "call" command, polling can be done from anywhere in The Artifact.

poll -w
Checks the status of equipment with work to do in the Hex (such as Hosent). Gives a status

of the device as on, off or in error (usually if the device does not respond). Also returns the device id and terminal id (if applicable). Also gives the jobs of the devices that are being processed. Occasionally terminals and filtration pumps will show up in this command but it is mostly used for getting information on the Hosent in the Hex.

port (number of port)
Toggles a port to the QLC to on or off. This command can only be run from the terminal directly on the QLC. There are six ports to each QLC, one from each neighboring Hex. The numbers start coming from the Hex side closest to the Power Hex and to the counterclockwise side of the hex and continues counterclockwise around.

terminal (Number of terminal)
Send data to the terminal's video and/or audio output. Text is displayed in Chezbah characters.

terminal -g Gets all the terminal ids connected to the Hex Mainframe.

terminal -gt Gets the temporary terminal ids connected to the Hex Mainframe.

terminal -g (Floor)
Gets the terminal ids on a specific floor of the hex connected to the Hex Mainframe.

terminal -o (Number of terminal)
Toggles the connection to a terminal on or off (Hosent connect as terminals). This command can only be run from the terminal directly on the QLC. Some emulators support entering a range of terminals (for example 1-150).

top
Stolen from Unix, displays how much of the processor power is being used and what programs or processes are using the processor the most.

work (service)
Toggles a service on or off. Jobs include: rain cycles, air circulation, pumping water, electrical power, lighting. When looking for covert passages, plasma and water mains are excellent considerations, but only if they are off. The status of these conduits can be found, and if still on, they may be turned off for limited periods. When traveling though cities it is good to have illumination for ease of travel and for mental well being. Added to that is possible tactical advantages of turning lights on and off during combat.

QLC Software

Communications Officers and Field Scientists have developed a large body of useful tools to operate on QLCs and especially on Hex Mainframes. Some of the available software is listed in the Computers and Software section of this book under software. Players with the Computer Programming skill also have the ability to write software for their use. The Game Master should scrutinize new programs for anything that would be game unbalancing. As the GM, you should ask your players how their software is supposed to work. If the player simply wants to recreate a program that already exists in the real world the GM should allow it but would take into account the complexity of the program to be written. Developing a GUI Operating system for a Hex Mainframe would be a complex and difficult task. It is also up to the GM to introduce glitches in player developed software.

Chezbah Reaction

When a character uses The Artifact's network to communicate to a remote location (following the process on Page 70 of The Artifact RPG) and they fail a roll, the Chezbah may be alerted to their presence. This section gives some structure to that possibility.

The Chezbah response to network use is greatly reliant on the proximity of Chezbah forces from the transmission. If the local forces are planned out because of the game then this question is relatively straightforward. If the game does not directly require the presence of Chezbah forces then the question can be answered through the random table below.

If the characters are in Chezbah territory, add 20 to their roll. If they are in Kelrath territory subtract 20 from their roll. If the characters are in remote areas subtract 22 from their roll. If the characters are in the Methane Wastes this table does not apply. There is almost no likelihood of Chezbah forces in the area.

1D100
Local Chezbah

01-75	No Local Chezbah Forces
76 - 77	5 Roaming Hounds 40 Km away
78-79	2 Warriors 10 Hounds 40 Km away
80-81	10 Warriors and 1 Priest 40 Km away

82 Convoy of Civilians 1 Priest 10 Warriors 50 Hounds 40 Km away
83-84 2 Hunter e-suits 40 Km away
85 1 Demolisher, 1 Priest and 4 Hunter E-suits 40 Km away
86-87 5 Roaming Hounds 10 Km away
88-89 2 Warriors 10 Hounds 10 Km away
90-91 10 Warriors 1 Priest 10 Km away
92 Convoy of Civilians 1 Priest 10 Warriors 50 Hounds 10 Km away
93 2 Hunter e-suits 10 Km away
94 1 Demolisher, 1 Priest and 4 Hunter E-suits 10 Km away
95 5 Roaming Hounds 1 Km away
96 2 Warriors and 10 Hounds 1 Km away
97 10 Warriors and 1 Priest 1 Km away
98 Convoy of Civilians 1 Priest 10 Warriors 50 Hounds 1 Km away
99 2 Hunter e-suits 1 Km away
100 1 Demolisher, 1 Priest and 4 Hunter E-suits 1 Km away

The chance of local Chezbah forces (see above) investigating a signal that has not been decrypted is 90% but is effected by the range from the transmission source. The Range Class modifiers of D apply to this roll. If the Chezbah are 40 kilometers away there is a -50 to their chance of investigating.

The Chezbah and the Network

The Chezbah make use of The Network with autonomy. Even Chezbah civilians are permitted and encouraged to transmit messages for friends, relatives and business dealings over the network. These messages carry very simple encryption (count as weak encryption).

The Chezbah civilian bring their message to a designated office that then relays the message to the remote office where the recipient is close to. The recipient office then hand writes out the message and delivers it to the intended recipient. This kind of traffic is easy to decrypt and is full of details on Chezbah society, but normally has little tactical value.

Chezbah Warriors are able to use the terminals located inside of a Hex to send progress reports and distress signals. These messages have strong encryption but are very useful in gaining tactical advantages (count as strong encryption).

Chezbah troop movement and positioning can be found and followed by looking for Chezbah transmissions which are almost constant. If the Chezbah encryption can be cracked, then more information may be discerned by the message sent.

Chezbah Priests and Hounds use the strongest security in their transmissions. While hounds will transmit their location and status every 48 minutes, Chezbah Priests transmit continuously. Both use very strong encryption (1200 BP), but even after the encryption is cracked, the message has little intelligible data in it. The transmissions are not text and while some video data can sometimes be recovered, it is unclear what the bulk of these transmissions contain. It is apparent that whatever data is being transmitted, is intended for an operating system that is very different from the QLC mainframes.

Whenever a Chezbah Priest is in the area, the network is used to its maximum capacity. Any other transmissions have difficulty getting through. However if there is more than one Chezbah priest in the same area, the network traffic remains the same it appears that only one priest transmits for the group. This is the same for hounds. If there is a single hound or a pack the network traffic is the same.

Chezbah Priests do not connect with QLCs through a terminal id. They seem to link directly to the processor allowing them to send commands as if directly to at the QLC. When they move from hex to hex, the Priest connects to the mainframe of the hex they are in. The exception to this is if the Hex mainframe is not functioning. In this case the Priest remains linked to the last functional mainframe that they pass. As soon as there is a closer mainframe, the Priest connects to that mainframe.

Kelrath Communications

The Kelrath do not use the network extensively but will establish secure routes between cities by isolating a string of QLC Mainframes. The ports that lead anywhere but the intended path are disabled or more often physically cut. Terminals are also disconnected. This method prevents Chezbah eavesdropping but does not exclude the possibility of the line being tapped. Periodically patrols of Geetin escorted by a Gijorn trace the communication path to make sure no one is tapping the line.

The Kelrath use average encryption in their network and radio communications.

Computers and Software

Personal Computer

Personal computers saw a meteoric rise in the early part of the century. The last radical improvement in the personal computer came in late 2052 with third generation quantum dot computing. However, as the energy needs of Earth's population diversified, solar panels caused processor grade silicon to become more and more scarce.

While this slowed the advancement of the personal computer, supercomputers using a verity of exotic optical and liquid processors became more important to information processing. While the early part of the century saw a rise in distributed computation, the latter saw a return to centralized processing in mainframe systems usually referred to as cloud computing. The Artifact has the potential to mimic the network that has been established on Earth because of its data infrastructure, but the stranglehold of the Chezbah on these systems has so far prevented this from being implemented.

The operating system of personal computers includes voice recognition (98% successful), and limited translation features (30% successful for major earth languages).

PCs can use a military or Scimrahn communicator as a bridge to the Artifact's data network. A short range radio chip that is common to most computers connects to the communicator and the communicator can then connect to the data network.

A computer can run as many programs as their processor points allow. Each software program has a number of processor points used. Once all of the computer's processor points are used it cannot run any more software until programs are shut down.

Desktop

Personal Computers or PCs come in a variety of styles and types. The most versatile and expandable of which is the Desktop. It is designed to be stationary so its components are slightly larger and less expensive.
Processor Points: 12
Storage: 100 Terabytes
Mass: 30 Kg
Cost: ¥20,000

Laptop/Tablet

The laptop or tablet personal computer is usually a centimeter thick, twenty centimeters deep and thirty to forty centimeters wide. The laptop or tablet is designed to be a portable system but is often used while stationary. The line between a Laptop/Tablet computer is often blurred when using a HUD (Heads Up Display) as the primary video output.
Processor Points: 10
Storage: 90 Terabytes
Mass: 2 Kg
Cost: ¥30,000

Wearable

The Wearable computer is designed for processing on the move. It is most popular with augmented reality systems (see software). Wearable computers are systems that are built into clothing or strapped onto the body. Wearable Computers are more resistant to shock, dust and impact than laptop or tablet computers.
Processor Points: 8
Storage: 50 Terabytes
Mass: 2 Kg
Cost: ¥35,000

Quantum Liquid Computer (QLC)

Quantum Liquid Computers use photon energy in a liquid sodium media to store and calculate information. Sodium atoms are kept under high pressure and begin to behave as a liquid in chambers called "wave guides". Electrical current applied to these wave guides alters the sodium atoms spin and thus the properties of the liquid. Dependant on the spin state, the liquid takes on different optical properties that allow the wave guides to store photons or emit photons with different spin states. Although computers using a similar processor design became more common on earth after 2040, they relied on ultra cold temperatures to operate. Quantum Liquid Computers developed on The Artifact have hundreds of times the quibits (Quantum Bits) than those built on earth.

The processors of a QLC also function as data storage instead of using a separate storage device such as a hard drive or caterpillar drive.

Personal QLC

These are the processors for the Scimrahn Comm/Comp.
Processor Points: 13
Storage: 500 Gigabytes

Mass: 200 g
Cost: ¥2,000

Small QLC
Two of these computers manage the terrain handling and balance of the TF-2394 E-Suit.
Processor Points: 32
Storage: 200 Terabytes
Mass: 50 Kg
Cost: ¥6,000

Medium QLC
One of these computers handles the operation of each TF-2394.
Processor Points: 73
Storage: 800 Terabytes
Mass: 200 Kg
Cost: ¥8,000

Large QLC
Processor Points: 156
Storage: 3 Exobytes
Mass: 600 Kg
Cost: ¥12,000

Hex Mainframe QLC
Hex Mainframes are massive QLCs that maintain each hex. In truth they are overkill for what they are used for. Only one percent of the processing power is used to handle the operation of the hexes.
There are several native programs on these QLCs that should be noted. The operating instructions allow the system to be "self healing". In other words the system will restart any crashed or errored processes to bring them back into operation.
Processor Points: 92
Storage: 1 Exobyte
Mass: 480 Kg
Cost: ¥4,000

Hosent Brain
The QLCs used in Hosent are widely available in industry hexes and are used for a large variety of functions where the size of the processor is not an issue. The Hosent Brain is a tube measuring 120 cm tall and 120 cm in diameter.
Hosent Brains that are for sale are usually just covering the labor costs of removing and transporting the processor.
Processor Points: 383
Storage: 20 Exobytes
Mass: 2,000 Kg
Cost: ¥4,000

Kerdi Brain
The Kelrath manufacture and sell the QLC that is used in Kerdi robots. They are sold without the control instructions that the Kerdi function by.
Processor Points: 264
Storage: 15 Exobytes
Mass: 500 Kg
Cost: ¥10,000,000

Software

Computers have been in general use for just over a hundred years. In that time, a vast number of programs have been written for nearly every conceivable purpose. The following is some of the software that has been found useful on The Artifact. Some of the technology and strategies that are used on the Earth's Internet have proven themselves effective on The Artifact's network. However, there are some limitations to the data transfer between mainframes. Some of the programs have been written by communications officers and are distributed freely, while others are commercial programs.
A computer can run as many programs as their processor points allow. Each software program has a number of processor points used. Once all of the computer's processor points are used it cannot run any more software until programs are shut down. It takes one turn per processor point used to start or shut down a program.

Address Spoofer
Gives a false transmission address in a data message to prevent revealing the sender's location. Note: the receiving address has to remain intact in order to get to the intended recipient.
This hides the sender's location but not the receiver's. It also means that the receiver cannot reply because they do not have the correct address to reply to.
Used Processor Points: 0
Size: 2 Megabytes
Cost: Freeware

A N R T M (Artifact Network Relay Text Messaging)
While military communicators have the ability to send streaming audio messages over The Artifact's data network, PCs need this program to send text messages.
Text messages are advantageous for several reasons. They are small and encrypting them takes little processor power,

They are less likely to be noticed due to their small size, data can be sent in one short burst instead of the long continuous streams used in audio and video communications.

This program makes sending data over the network easier and gives a +10 to the Computer Programming skill for writing a script to avoid Chezbah probes.
Used Processor Points: 0
Size: 4 Megabytes
Cost: Freeware

ASO Operations Manual (Electronic Form)

The information in the ASO operations manual can be very useful for defining how to proceed in most common situations. It includes some rudimentary Scimrahn and Kelrath. Includes tips for handling social and combat interactions in the different cultures. It also includes a good amount of information on how to find food, electricity and water. The electronic version is searchable by table of contents and by keyword.

For game purposes the manual has similar information to what is in the first 27 pages of this book but would also contain detailed procedures on how to accomplish tasks. Effective as a Foraging skill (+5) and a Scimrahn, Kelrath and Chezbah Culture skill (+5). Takes five minutes of reading each time the character wants to use the skill.
Size: 30 Megabytes
Cost: Freeware

Augmented Reality

Augmented reality software uses video cameras and audio inputs to monitor the outside world. It acts by processing video information, finding patterns and offering data back to the user. AR software uses databases of patterns that can be generated on the fly or can be pre-generated and distributed.

An example of how AR software works in normal use on Earth could go as follows. A police officer is driving his patrol car, a number of cars are in front of him. A special database of license plate patterns and a database of license plates and their owners allows the AR program to identify the cars on the road. It checks to see if the plates are not on the wrong model car (an indicator that they might have been stolen). It also checks for outstanding warrants on the plate owners. If a match is found, the software notifies the user and tells them which car has the offender.

This technology is useful in military intelligence in identifying unknown targets, their fighting power and effective countermeasures. There are several databases under development for The Artifact.

AR software can use a HUD (Heads Up Display) to display information, overlay text data, highlight objects for identification, augment poor quality video by overlaying 3D models and overlay sensor readings over visual data (such as infra-red sound or radar).

The strength of the AR software is that it processes video and audio data in real time and displays results in real time.
Used Processor Points: 2 per database
Size: 30 Gigabytes
Cost: ¥18,000

Chezbah Database

Identifies and classifies all known Chezbah personnel, whether they are combatants or not, and suggests combat strategies known to be effective. Also classifies common Chezbah equipment and can identify Chezbah vehicles.

This database is effective as a Military Intelligence skill (+40) for Chezbah targets.
Size: 20 Gigabytes
Cost: Free

Kelrath Database

Identifies and classifies all known Kelrath personnel, whether they are combatants or not, and suggests combat strategies known to be effective. It should be noted that the database has a difficult time classifying Geetin who are not in armor. Also classifies common Kelrath equipment and can identify Kelrath vehicles.

This database is effective as a Military Intelligence skill (+40) for Kelrath targets.
Size: 40 Gigabytes
Cost: Free

Scimrahn Database

Identifies and classifies all known Scimrahn personnel, and suggests combat strategies known to be effective. Also classifies common Scimrahn equipment and can identify Scimrahn vehicles.

This database is effective as a Military Intelligence skill (+40) for Scimrahn targets.
Size: 30 Gigabytes
Cost: Free

Military Vehicles Database

Identifies and classifies military vehicles common to The Artifact and suggests

strategies that are known to be effective. This database can identify critical hit locations for targeting by snipers.

This database is effective as a Military Intelligence skill (+40) for military vehicles.
Size: 15 Gigabytes
Cost: Free

Vehicle Repair Database

A database of the internal workings of ASO, I-CA and Scimrahn vehicles. Can identify worn parts, locate sources of engine noise, and display the proper method of removing or replacing parts. The program requires a directional microphone to implement some of these features. This database is effective as a Repair Machinery skill (+20 with directional mic, +15 without one).
Size: 60 Gigabytes
Cost: Free

Personal Contacts Database

Can identify personal contacts and biographical information about them that has been entered by the user, or is picked up by listening to conversations. The database creates captions about the contact and the conversation. The database records every conversation and tracks who the conversation was with. This allows the user to never forget the details of their personal contacts.

The personal contacts database can use video identification software to instantly recognize any contact that is in the database.
Size: 10 Gigabytes
Cost: ¥2,000

Rare Items Database

A database of rare and mythical items, people and places pertaining to The Artifact. When the user examines an object, the possible matches for an item are displayed based on the user giving a dialog about the item. The database attempts to match key words and phrases.
Size: 5 Gigabytes
Cost: Free

Plant Database

The Plant Database is useful for identifying Flora and the properties of the plant subjects. The database can pull up information based on video of the plant or a verbal description.

This database is effective as a Botany skill (+40) and Foraging skill (+20).
Size: 30 Gigabytes
Cost: ¥2,000

Biology Database

The biology database is a robust and well developed tool that can identify and classify known animals and plants. It also can be useful in cellular studies, dissections and can assist in classifying unknown species.

This database is effective as a Biology skill (+30).
Size: 40 Gigabytes
Cost: ¥4,000

Chemistry Database

The chemistry database aids in identifying chemical compounds and their potential functions. It can also take a group of chemicals, and determine all the known substances that they can be combined to create and the process of how to create them.

This database is effective as a Chemistry skill (+30).
Size: 50 Gigabytes
Cost: ¥6,000

Backdoor Virus

This class of viruses spread themselves to a target system and then open a full access backdoor that the hacker can use.

This listing is not a single program, it is a whole class of programs. Once it is detected for the first time it's lifespan starts to be used up. (See: Planting and Deploying Viruses: Virus Lifespan)

Each purchased virus only works on one vehicle or computer system. When purchasing a virus, the type of system it effects should be noted.
Defeat Security Rating: 15
Barrier Points: 95
Self Propagating: Yes

Class A
Detection Modifier -20
Cost: ¥32,000

Class B
Detection Modifier 0
Cost: ¥14,000

Botnet Virus

This virus spreads itself slowly at first but then uses each infected system to attack more systems.

The virus contains two programs. One that links the attacks of all the effected systems. The other sends back all the encryption codes on the infected systems

either by radio or over the network back to the hacker giving them full control over the systems. If the codes are changed while the viruses are in place the new codes are sent out to the hacker.

This listing is not a single program, it is a whole class of programs. Once it is detected for the first time it's lifespan starts to be used up. (See: Planting and Deploying Viruses: Virus Lifespan)

Each purchased virus only works on one vehicle or computer system. When purchasing a virus, the type of system it effects should be noted.
Defeat Security Rating: 10 for each system infected.
Barrier Points: 80
Self Propagating: Yes

Class A
Detection Modifier -20
Cost: ¥65,000

Class B
Detection Modifier 0
Cost: ¥28,000

Box in a Box

This program copies the operating system and conditions on a QLC and then creates a virtual system that pretends to be the QLC. Any transmission to the QLC, or attempt to shell into the QLC is sent to the virtual "Box". This way anyone who looks into the QLC will only see the status quo. The only way to detect the presence of a virtual box is by a brute force attack on the data capacity of the QLC (trying to fill it over its capacity. The user of this software can monitor all broadcasts that are coming in and can monitor anyone sending commands to the QLC and what commands they are sending.
Size: 1 Terabyte for the program 100 Terabytes for the virtual QLC
Cost: Freeware

Broadcaster

Sends a message out to all systems. This is used to keep the receivers location a secret, but nearly insures that a message will be intercepted.
Used Processor Points: 0
Size: 1 Megabytes
Cost: Freeware

Defeat Security Software

This is a software package that contains several programs that are useful for hacking computers.

The speed that a computer can hack the Barrier Points on a target computer depends on how much processor power it is given. In addition, several computers may be networked together and combine their processing power.

The software breaks down one (1) Barrier Point for every point of Defeat Security Rating (DSR) every ten minutes it is attacking the system.
Used Processor Points: 5 per each +3 DSR
Size: 70 Gigabytes
Cost: Freeware

Code Cracking Software

Code Cracking software is used to "guess" at codes used to encrypt messages. While military communicators have powerful processors built into their hardware for this purpose, a PC must have this program to perform the same function.

The speed at which a PC can crack a code is not as fast as military communicators. However the computers may be used in tandem with a communicator to speed up the process. In addition, several PCs may be networked together and combine their processing power.

The software breaks down one (1) Barrier Point for every point of Code Cracking Rating (CCR) every ten minutes it is attacking the system.
Used Processor Points: 5 per each +5 to CCR
Size: 50 Gigabytes
Cost: Freeware

Emulator for Artifact Quantum Liquid Computers

The Artifact QLC mainframes use a four quibit structure similar to the numbering system used by the inhabitants of The Artifact. Because of this, Computers made on Earth need to run special emulation and translation programs in order to communicate on The Artifact's network. There are many versions of these programs and they are often freely available.

This program is needed to connect a Personal Computer to the Artifact's network or to connect to a Scimrahn Comm / Comp.
Used Processor Points: 4
Size: 30 Gigabytes
Cost: Freeware

Encyclopedia (Electronic Form)

Encyclopedias can become very useful when the data in them is instantly available. Text to speech software can be used to read passages for "quick studies" on subjects. Electronic versions are searchable by keyword and subject.
Size: 3 Gigabytes
Cost: ¥400

Fast Kill Virus

This class of viruses disables the computer's operating instructions by deleting vital files. It does not attempt to infect other systems and because it disables a system immediately once it has broken down the system's barrier points it does not need Barrier Points. This makes the virus very small and difficult to detect.

This listing is not a single program, it is a whole class of programs. Once it is detected for the first time it's lifespan starts to be used up. (See: Planting and Deploying Viruses: Virus Lifespan)

Each purchased virus only works on one vehicle or computer system. When purchasing a virus, the type of system it effects should be noted.
Defeat Security Rating: 60
Barrier Points: 0
Self Propagating: No

Class A
Detection Modifier -80
Cost: ¥75,000

Class B
Detection Modifier -60
Cost: ¥30,000

Class C
Detection Modifier -40
Cost: ¥10,000

Kill Virus

This class of viruses spread themselves to a target system waits until it has infected two other systems and then disables the computer's operating instructions by deleting vital files.

This listing is not a single program, it is a whole class of programs. Once it is detected for the first time it's lifespan starts to be used up. (See: Planting and Deploying Viruses: Virus Lifespan)

Each purchased virus only works on one vehicle or computer system. When purchasing a virus, the type of system it effects should be noted.
Defeat Security Rating: 50
Barrier Points: 30
Self Propagating: Yes

Class A
Detection Modifier -50
Cost: ¥32,000

Class B
Detection Modifier -30
Cost: ¥14,000

Network Gateway

This software is an intelligent firewall designed to act as a secure gateway for large networks such as a Hosent Hive.

The gateway is installed on any system that talks to computers outside the network. For the example of a Hosent Hive, the network gateway would only have to run on the Hex Mainframe in that Hex.

The Network Gateway uses intelligent agents to monitor traffic
Barrier Points: 50 +1 for each extra Processor Point allocated to the gateway.
Used Processor Points: 4+
Size: 400 Gigabytes
Cost: ¥1,000

Packet Sniffer

These programs listen to the network and pick up messages that travel across the computer the packet sniffer is on. Normally, if the data packet is not meant for the computer you are at then the computer will simply forward the message and otherwise ignore it. A packet sniffer forwards the message as normal, but keeps a copy to be examined. The Chezbah use a version of this kind of program to monitor The Artifact's data network.
Used Processor Points: 1
Size: 2 Megabytes
Cost: Freeware

QLC Unix

This is a port of the Unix operating system for use on a QLC. It allows a QLC to run any of the programs listed in this section and provides a familiar operating environment for Earthers.
Barrier Points: 45
Used Processor Points: 3
Size: 100 Gigabytes
Cost: Freeware

Scimrahn Comm / Comp OS

This is the operating system used on the Comm / Comp but is designed to be installed on any QLC.
Barrier Points: 50
Used Processor Points: 8
Size: 200 Gigabytes
Cost: Freeware

Security Software

This software is a bundle of security programs including firewalls, antivirus programs, and algorithmic monitoring agents that monitor communication on the system and look for patterns of harmful communications and processes.

The security package can be installed on either a personal computer or there is a version ported over for QLCs.

Personal Computer
Barrier Points: 100
Used Processor Points: 3
Size: 300 Gigabytes
Cost: ¥1,000

QLC
Barrier Points: 90
Used Processor Points: 8
Size: 800 Gigabytes
Cost: Freeware

Translator software

Translator software uses multiple processes to find the most likely translation of a spoken phrase. The program is normally effective in everyday conversation, but has difficulty with technical or unusual subject matters. Often when the translator does fail it is in the syntax of the translated phrase. This can make the translation difficult to understand or can twist the meaning into something entirely different.

This program is effective as a single language skill (40% success rate). A different program must be purchased for each language that needs translation.
Used Processor Points: 2
Size: 20 Gigabytes
Cost: ¥4,000

Video Identification

Video identification software uses biometrics to record an individual's identity. This biometric data can be entered manually, or the program can generate the information from still images or video files. It can then be used as security to verify a person's identity, or can be used to locate a person in live video or recorded video.

This software can be integrated into an augmented reality software system to generate possible matches in real time.
Used Processor Points: 3
Size: 50 Gigabytes
Cost: ¥5,000

Video mapping software

Video mapping software is designed to take input from a camera, process the video information and produce a three dimensional map of the solid objects in the video. The longer the video and the more the area is explored will effect the software's ability to map the area.

The program can generate a map in real time from video input, or can take recorded video and generate a map. It is important to note that the software will only be able to record what it "sees". If something such as a door or hole is blocked from the camera's view, the software will not be able to extrapolate that it was there. Likewise if the camera is never pointed in a certain direction, the software may attempt to extrapolate what was there, but will choose to insert blank walls or that nothing was there at all.

The mapping program will use the video information to create images that are automatically applied to walls, floors etc. so the map may be toured as if it were the real place.

Maps can be re-touched by more video of an area that is taken at a later time. The program can also export its map as a three dimensional object to other programs. These maps are compatible with augmented reality software.
Used Processor Points: 2
Size: 150 Gigabytes
Cost: ¥6,000

Virtual Private Network (VPN)

Virtual Private Networking is a system that establishes an encrypted session between to computers. This is used to create a secure connection over an insecure network such as the Internet or The Artifact network. The hazards of communicating over The Artifact's network warrant that any VPN use a very strong encryption and are therefore very processor intensive.
Barrier Points: 700
Used Processor Points: 10
Size: 7 Gigabytes
Cost: Freeware

Equipment Compendium

The equipment in this book is not always available to those outside of Gadios and the Game Master should make it difficult to acquire any of the items listed here unless there are special circumstances. In addition to this, the high cost of transporting material to The Artifact make importing these goods prohibitively expensive. As a result, nearly all of the goods listed here are manufactured in or near Gadios by corporations that are setting up shop on the Artifact.

Survival Gear

AC Power Inverters

An inverter converts DC power such as that produced by a vehicles alternator or from a battery to alternating current that is used to power most devices.
Mass: 2 kg
Cost: ¥3,080

Acoustic Amplifier

These are listening devices that amplify faint sounds by 35-40 decibels so that they can be more readily heard. Background sound is also amplified.

These devices often have a simple microphone attached, but their performance is greatly enhanced by using a quality external microphone. A headset can be used to monitor the output of the amplifier, or it can be plugged into almost any other device that has a sound input.
Mass: 600 g
Cost: ¥2,000

Acoustic Ablation

Acoustic ablation systems take ambient noise and broadcast the opposite waveform to cancel out (or ablate) sound. The system is only effective at ablating relatively quiet noises such as heartbeats, footsteps, and breathing (sounds that are less than 50 db).

This ECM is only effective at blocking detection that would use sound.
ECM Range Class: A
Mass: 800 g
Cost: ¥3,000

Acoustic Ear Protection

When near sources of loud noises, it is beneficial to have hearing protection. These hearing protectors lower the decibel level of sound reaching the ears by 35 db.
Mass: 200 g
Cost: ¥600

Acoustic Ear Protection / Amplification

Similar to normal ear protectors, but these incorporate a sound amplification system. When near sources of loud noises greater than 82 db (gunshots, loud equipment, etc. will trip the system) these hearing protectors lower the decibel level of sound reaching the ears by 35 db. When not in the presence of loud noises, other noises are amplified by 15 db enabling the user to hear faint and normally inaudible sounds easily.
Mass: 200 g
Cost: ¥3,200

Air Mattress

Tired of sleeping on the cold hard ground? An air mattress can help keep you more comfortable and warm. However if the ground is warmer than the air the mattress will actually make you colder.
Mass: 500 g
Cost: ¥2,000

Aireocapsules

Aireocapsules are nanometer diameter spheres that hold reactively high concentrations of oxygen. They are ingested or injected and travel through the blood stream. The Aireocapsules start absorbing CO_2 and releasing oxygen. This gives the user the ability to maintain very high levels of activity in thin atmospheres or to hold their breath for very long periods of time.

Aireocapsules are designed to detect a rise in CO_2 in the bloodstream maintaining a normal blood-oxygen level and can remain in the bloodstream for hours until activated. The Aireocapsules begin to release oxygen and absorb CO_2 immediately. This enhances the physical stamina of the user.

Effects: The user can hold his or her breath for the effective duration of the dose. If the user engages in strenuous physical activity they get a +40 to Con and +5 to Str for the duration of the dose. As long as the user can breath normally and they are not engaged in strenuous activity, the Aireocapsules shut down and remain in the blood stream extending the duration of the dose until CO_2 levels increase again.
Injection dose: 2 hours

Ingestion dose: 15 minutes
Cost: ¥2,000 per dose

ASO Operations Manual

The information in the ASO operations manual can be very useful for defining how to proceed in most common situations. It includes some rudimentary Scimrahn and Kelrath. Includes tips for handling social and combat interactions in the different cultures. It also includes a good amount of information on how to find food, electricity and water.

For game purposes the manual has similar information to what is in the first 27 pages of this book but would also contain detailed procedures on how to accomplish tasks. Effective as a Foraging skill (+5) and a Scimrahn, Kelrath and Chezbah Culture skill (+5). Takes ten minutes of reading each time the character wants to use the skill.
Mass: 100 g
Cost: free

Bicycle

Bicycles are lightweight and very quiet. They are also very small making them ideal in cramped spaces.

Str Roll

Speed in Km/h

	Fail	Full	1/2	1/4	1/8
Speed:	15	20	24	27	30

Mass: 8-15 kg
Cost: ¥6,000-12,000

Chain Hoist

A chain hoist is a heavy-duty chain that is wrapped around one or a number of pulleys. When attached to an overhead surface capable of bearing the weight, the hoist can lift up to 6 tons off the ground. Chain hoists are often operated by hand although some use electric motors. Because of the pulleys involved, the lifting process is slow. Often it takes upwards of one minute to raise an object one meter.
Mass: 50 Kg
Cost: ¥10,000

Chain Saw

A chain saw is useful for cutting through unarmored obstructions at a rapid rate. However armored objects will quickly dull the blade.
Damage: 20
Parry: -10
Mass: 2-5 Kg
Cost: ¥6,000-10,000

Chemical Suit

Prevents toxic chemicals from touching the skin, also masks human sent, useful for keeping Seeters away.
Mass: 1 Kg
Cost: ¥400

Cot

Cots are collapsible beds made of canvas stretched over a frame.
Mass: 6.7 Kg
Cost: ¥800

Collapsible Chair

A very nice item to have. By staying off the ground a chair can keep you dryer and relatively warmer.
Mass: 2.1 Kg
Cost: ¥200

Collapsible Table

A wonderful invention for keeping items off the ground, such as food or cards.
Mass: 9 Kg
Cost: ¥1,000

Communication Wire

Often, when given enough time, military forces will set up their own communication networks to protect against eavesdropping. The two most common media for setting up such a network are copper and fiber optics.

Copper

Copper communication wire is cheap and relatively easy to work with. However the wire can be tapped without much effort if the cable is found.

Copper wire requires a signal booster (repeater) every five hundred meters
Mass: 2 Kg per 100 meters
Cost: ¥400 per 100 meters

Fiber optic

Fiber optic cable is more expensive than copper but it has several advantages. It is very hard to tap a fiber optic line without making the user aware that something is going on. Fiber optic cable carries more information than a copper pair. It also can send a signal greater distances without a signal booster.

Fiber optic lines require a signal booster every 12 Km.

Mass: 6 Kg per 500 meters
Cost: ¥6,000 per 500 meters

Compass

It was originally thought that a compass would be useless in the Artifact, however the magnetic plasma conduits will draw the magnetic needle to alignment with it.
Mass: 50-175 g
Cost: ¥600-4,000

Compression Sack

Compression Sacks are like duffel bags with special reinforcements that allow the bag to ratchet down on its contents and reduce their total volume. This is very useful for clothing and other fabric items as it forces the load to take up less volume.
Mass: 120 g
Cost: ¥400

Cooler

These thermally insulated containers can keep food cold for about 30 hours if they are replenished with a coolant. This is usually ice, but sometimes coolers have electricity-powered refrigerants.
Mass Empty: 1 Kg
Mass Full: 15-20 Kg
Cost: ¥800
Powered Cost: ¥2,000

Diving Fins

Used for faster swimming in water.
Effect:+10% to swimming speed.
Mass: 190 g
Cost: ¥600

200 Liter Drums

Good for holding water, fuel, oil or other goods. It is a bad idea to change what liquids a barrel is holding, for instance, a barrel that once held fuel should never be used to store drinking water.
Mass: 15 Kg
Cost: ¥1,000

Duct Tape

Invented to hold metal ductwork together, Duct Tape has become a must have for temporary fixes of all sorts.
Cost: ¥30 per 10 meter roll

100 mph tape

Very similar in appearance to Duct Tape, 100 mile per hour tape gets it's name from it's intended function of sealing bullet holes in airplanes. It now sees a great deal of use by the NACSP military forces as a temporary repair tool.
Mass: 550 g
Cost: ¥40 per 10 meter roll

Electrical Power Converter

The electrical power that is used in The Artifact's incremental cities is over five hundred volts AC and operates at 14 kilohertz. In other words if you plugged any conventional device that was developed on earth it would very likely melt. To make the commonly available electrical power usable, a power converter is needed.

The converter can output electricity at 120 volts ac at 50 or 60 hertz, or 12 volts DC. Some units also can output 220 volts AC.
Mass: 60 Kg
Cost: ¥6, 240

Electrical Wire

Electrical wire is very useful for setting up camps and distributing electrical power. They allow electric lights to be distributed for better illumination. Electrical wire is also very useful for powering communication equipment and sensor systems.
Mass: 2 Kg per 10 meters
Cost: ¥300 per 10 meters

Gas Mask

Gas masks are not often seen since Vac Suits do a better job of protecting from hostile environments. However gas masks are easier and quicker to put on in an emergency.
Mass: 709 g
Cost: ¥400

Generator

A small internal combustion engine that turns a pre-specified fuel into electricity. The fuel can be gasoline, diesel, methane, hydrogen, or alcohol.

Runs for 5 hours on a refill.
Mass: 30 Kg
Cost: ¥10,000
Refill Cost: ¥100

Ghillie Suit

3d camouflage suit used for hiding in foliage. +10 to Camouflage skill when hiding in foliage.
Mass: 2.27 Kg
Cost: ¥1,000

Handcuffs

Useful for restraining people from using their hands.
Mass: 340 g
Cost: ¥350

Head Lamp
Hands free flashlight.
Mass: 40 g
Cost: ¥200

Heater (Electric)
Uses either 12vDC from a vehicle or 110v AC from a power converter.
Mass: 3.17 Kg
Cost: ¥600

Heater (Fuel)
These heaters use some form of pre-determined fuel to heat a room or tent. The fuel used can be propane, methane, hydrogen, alcohol or gasoline.
Runs for 3 hour on a refill.
Mass: 3.17 Kg
Cost: ¥2,000
Fuel Refill Cost: ¥40

Heads Up Display (HUD)
HUDs were originally implemented widely in combat vehicles in the late 20th century. They displayed targeting information and allowed the pilot to keep his or her head up while accessing this information. This is the reason for the name "Heads Up Display". The HUD projects an image either on to a pane that lies directly in front of the user's eye, or it is projected directly into the user's retina. Although originally adapted to increase piloting performance, the HUD's usefulness does not end there. The HUD's function is limited only by the imagination of developers.
The biggest limitation to the HUD was the display quality. Resolution was one problem, but brightness and opacity was another. It wasn't until the 2020's that these technical hurdles were cleared and personal HUDs came into widespread acceptance.
HUDs are usually combined with some form of headphone(s) to allow for sound and video to be delivered in the same package.
Mass: 50-250 g
Cost: ¥2,000-10,000

Human Scent Remover
This is a chemical spray that neutralizes the odors of the human body. Many find it useful for keeping Seeter from smelling you.
Mass: 560
Cost: ¥200

Hydraulic Jack
Hydraulic jacks are useful for lifting things temporarily off the ground, or separating two items provided the jack can be inserted into a gap.

5 ton capacity
Good for lifting light to medium sized vehicles such as transports or trucks
Mass: 20 Kg
Cost: ¥3,000

10 ton
Good for lifting large trucks, light APCs and shifting small boulders.
Mass: 25 Kg
Cost: ¥4,000

20 ton
Good for lifting APCs and shifting medium sized boulders.
Mass: 35 Kg
Cost: ¥6,000

30 ton
Good for lifting armored vehicles, light tanks and shifting large boulders
Mass: 50 Kg
Cost: ¥10,000

Inflatable Raft
An inflatable raft can be carried inside a large backpack. When needed, compressed air canisters or an air compressor can quickly inflate the flotation device.
Mass: 30 Kg
Cost: ¥4000

Anchor
Mass: 5 Kg
Cost: ¥600

Infrared Camera
These digital cameras are designed to pick up the infrared spectrum. They transmit motion video to any common display and/or storage device.
Datarate/hour: 6 gigabytes
Mass: 190 g
Cost: ¥16,000

Laser Pointer
A small convenient solid state laser. Can be fixed to a key chain, and can be seen in most day light equivalent conditions up to a

hundred yards away. Uses four watch batteries.
Mass: 5 g
Cost: ¥200

Laser Communicator
Laser Communicators require a direct line of site to operate and can be difficult to align properly. Some laser communicators are mounted on vehicles but portable units often use a miniature tripod to stay on target.
A laser communicator requires a dexterity roll to align. The PDF modifiers for range class apply to this roll.
Range Class: D
Mass: 500 g
Cost: ¥4,000

Leak Stop Aerosol Can
Good for stopping minor leaks in tires temporarily.
Mass: 250 g
Cost: ¥100

Life Vest
With a life vest a person can float in water almost indefinitely.
Mass: 1 Kg
Cost: ¥600

Metal Detector
Used to detect small and/or buried metal that can indicate mines or valuables among other things.
Mass: 1 Kg
Cost: ¥3,000

Microphone Directional
A microphone that is primarily designed to detect sounds emanating from a single direction. These microphones are often used for high fidelity recording.
This microphone increases the sensitivity of a device by five decibels (5 db).
Mass: 200 g
Cost: ¥2,500

Microphone Parabolic
This type of microphone uses a parabolic dish and a directional microphone to detect faint sounds even at a distance. Because of the parabolic dish, the microphone can pick up very faint background noises.
This microphone increases the sensitivity of a device by fifteen decibels (15 db).
Mass: 300 g
Cost: ¥5,000

Microphone Omnidirectional
Omnidirectional microphones detect sounds coming from all directions around it. The sound quality is not as good as a directional microphone.
This microphone increases the sensitivity of a device by two decibels (2 db).
Mass: 200 g
Cost: ¥ 2,000

Mirror (angled dentist)
Useful for a wide verity of tasks such as looking into machine parts and looking around corners without exposing oneself. The mirror is very small so large objects that are close by are hard to recognize (-20 Int).
Mass: 20 g
Cost: ¥100

Moisture Absorbent Packets
Protects guns knives papers books and clothing from moisture accumulating in storage. Will not absorb any significant quantity of standing water.
Mass: 2 g
Cost: ¥60

Motion Detector
Motion detectors use infrared beams to detect objects moving into their field of view. Crossing a single beam can trip the detector. The motion detector can be used to activate devices, sound alarms, turn on lights or cameras.
Every turn that an object is moving through the detector's field of view there is a ninety percent (90%) chance of detection. Range Class CDF modifiers effect this chance.
Range Class: A
Mass: 100 g
Cost: ¥200

MRE (Meals Ready to Eat)
MREs are the modern military rations. Each pack contains everything necessary to make and eat a meal including chemical heat packs to warm pre-cooked food.
1 day supply (3 meals)
Mass: 2 Kg
Cost: ¥250

Multi-function pocket tool
An expansion on the concept of a pocket knife, these tools often include needle nose pliers, wire cutters, wire strippers, a straight and phillips head screwdriver, a can opener, a bottle opener, a small knife, and an

assortment of other small tools. These multi-purpose tools do not function as well as the single purpose tools they emulate, but are much easier to carry and function adequately for quick jobs.
Mass: 100 g
Cost: ¥ 600

Parachute

A parachute can be useful when a character is on the upper floors of a Hex or flying a vehicle and suddenly need to get down to the ground.

Using a parachute successfully requires and Agility attribute check plus any Parachute skill the character might have.

Modern parachutes consist of a main chute, and a backup chute. The main chute has only a 1 in 1000 chance of failing because of an equipment failure. Backup chute failure is even rarer.
Mass: 15 Kg
Cost: ¥60,000

PDA (Personal Digital Assistant.)

Personal Digital assistants often are small handheld computers that can perform a smaller verity of tasks than a full sized computer. While many PDAs have powerful processors, they are often limited to using non-volatile memory for storage instead of caterpillar or quantum storage. Because of this they can only hold five to six hours of uncompressed video, or the equivalent. While the front of a PDA is often a small menu screen, a HUD is used as the main display.
Processor Points: 3
Storage: 100 Gigabytes
Mass: 125 g
Cost: ¥ 4,000

Pots and pans

Pots and pans are indispensable for preparing food. While they are bulky they are allow the character to prepare fresh foods instead of pre-packaged meals such as MREs.

Small assortment of pans
Mass: 20 Kg
Cost: ¥3,000

Large assortment of pans
Mass: 40 kg
Cost: ¥8,000

Camping set of pans
Mass: 1.5 Kg
Cost: ¥800

Pocket Chain Saw

This tool is a chain saw blade that has handles attached to either end of the chain. The chain is wrapped around the object being cut and drawn back and forth to perform the cutting action. While the trees on The Artifact are usually small and have poor quality wood, they are still useful for fuel.
Mass: 50 g
Cost: ¥600

Ratcheting tie downs

These tie downs are excellent for securing heavy loads so they do not shift during transport.
Mass: 100 g
Cost: ¥100

Ratcheting Winch 6 ton

These hand-powered winches attach by hooks to lift or pull two items together.
Mass: 2 Kg
Cost: ¥800

RF Scanner

A RF (Radio Frequency) Scanner monitors the entire RF spectrum for activity and tunes to the active frequency allowing the user to intercept radio transmissions. The Scanner also operates as a radio transmitter.
Mass: 100 g
Cost: ¥600

Sandbags

Sandbags are used to build temporary walls with materials that are readily available. The bags are nylon or some other resilient material. The Sandbag is filled with sand, dirt, rocks or any other heavy fill. The bags are stacked up to create a temporary but resilient barrier.
Mass: 100 g
Cost: ¥600

Shovel (folding)

Also referred to as E-Tools or entrenching tools. These small but sturdy shovels are useful for digging trenches or foxholes for protection from enemy fire.
Mass: 1 Kg
Cost: ¥300

SOLAS Food Pack

SOLAS (for Saving Of Life At Sea) food packs are high calorie food bars. They were formulated to sustain the lives of those lost at sea, but have come into high demand

among corporate scouts. Each pack contains nine (9) food bars. Three bars have enough calories to sustain a person's life for a day, so each pack can sustain life for three days. The only other difficulty is finding water.

It should be noted that the caloric intake of three bars a day is about a third of an average American's daily caloric intake. While it will sustain life, those from more affluent countries will not comfortably subsist on these rations. They will keep a human being alive.

Scimrahn can quite comfortably sustain themselves on these packs for extended periods.

SOLAS packs have a five year shelf life.
Mass: 600 g
Cost: ¥200

Spot Light

Hand held rechargeable 5 million-candlepower lamp. The beam can illuminate a spot greater than two hundred (200) meters away.
Mass: 5 Kg
Cost: ¥800

Spray Lubricant

The petroleum based lubricant is useful for getting rid of squeaks in rubbing parts, lengthens the operational life of mechanical parts, can help loosen stuck fasteners etc. +5 to Repair Machinery.
Mass: 170 g
Cost: ¥15

Stove (portable)

The portable stove is a propane or methane burning device that has a single burner. A bottle of fuel is screwed into an inlet valve. The Stove can be used for cooking or heating small spaces.
Burn Time: 1 hour per bottle
Mass: 500 g
Cost: ¥800

Fuel Bottle
Mass: 700 g
Cost: ¥200
Refill Cost: ¥80

Steel Toe Boots

Steel toe boots have a protective steel shield guarding the toes of the wearer. These boots are resilient and provide good protection for the feet. Contrary to popular belief steel toe boots effectiveness as weapons is dubious at best.
Mass: 700g
Cost: ¥800

Sunglasses

Sunglasses are useful on the surface where the suns are constantly shining.
Mass: 50g
Cost: ¥40-2000

Surgical Table (Folding)

This collapsible surgical table is useful for setting up temporary field hospitals. The table is mechanically adjustable to multiple surgical positions and folds into a box 80x100x120cm.
Mass: 200kg
Cost: ¥260,000

Thermos

A bottle that is thermally insulated by a vacuum. Used to store warm liquids for several hours.
Mass: 200 g
Cost: ¥200

Tactical Robot

Law enforcement and military organizations use tactical robots for situations where human survivability is low. These robots (also called tactical idiots and bricks because of their low intelligence) are used to remove bombs and mines from out of harms way.

They are heavily armored to withstand explosive blasts. The tactical robot is controlled by remote and can use radio or wire (where radio is not expected to penetrate) to receive orders. They are capable of some autonomy, but this is extremely limited. If contact with its control system is lost, the robot will attempt to follow the path it took back to the control system. This is one of the things that has earned the robots reputation for being tactical idiots, the robots are rarely successful in finding their way back. The brick nickname comes from operators saying that throwing a brick at an explosive device would be as effective as these Robots. These units are often sold with a transport and control vehicle that contains all the radio and control equipment necessary to operate the robot.

Length 1.8 m
Mass 567 Kg

Attributes
Constitution - 100

Strength- 150
Reflex - 10
Charisma - 1
Intuition - 5
I.Q. - 5
Agility - 10
Beauty- 10
Psyche- 10
Dexterity - 20
Hit Points - 100

Actions (1)

Damage Punch - 2 (punch damage is low due to the slow speed of the robot)
Crush - 20

Defenses Armor (AR 30)

Special Abilities
The tactical robot can communicate via radio.

Movement
Walking Speed: 5 meters/turn
Vertical Jump: 0 meters
Horizontal Jump: 0 meters

Control Vehicle

Type	Truck
Model	Varies
Overall height	1.65 m
Overall width	2.3 m
Overall length	3.8 m
Dry Mass	2253.6 kg
Full Mass	3687 kg
Power plant type:	Internal combustion

Movement

top speed	120 kph
Total fuel capacity:	16 hours
Fuel type:	Gasoline
Armor Rating:	10
Hit Points:	110
Crew:	1
Passengers:	2
Cargo Capacity:	1000 Kg
Piloting Modifier:	0

The control vehicle contains the following.
1 Tactical Robot
Robot transport harness
One ton lift gate.
Robot control cabin (built into the vehicle).
Radio transmitter range: 1 km
Communications Cable: 400 M
Cable AR: 8
Cable HP: 5
Complete system Cost: ¥5,000,000

Ultraviolet Camera
These digital cameras are designed to pick up the ultraviolet spectrum. This is useful for detecting high energy applications such as lasers, and force fields. They transmit motion video to any common display and/or storage device.
Mass: 190 g
Cost: ¥32,000

Video Camera (analog)
Because of the lack of resources on Earth, many old technologies are back in use. Analog video cameras record information on magnetic tapes or disks. They are more popular among poor and developing nations because of their low cost.
Maximum Recording Time: 2 hours
Mass: 500 g
Cost: ¥800

Video Camera (digital)
Digital video cameras record information on miniDVD disks or in high-end systems, caterpillar drives. They provide very high quality video and many can automatically correct for low light conditions and shaky camera handling.
Datarate/hour: 8 gigabytes
Mass: 400 g
Cost: ¥16,000

Video Mini Cams
These are Digital video cameras used mainly as computer input or in surveillance. Mini Cams do not provide the best quality images but are lightweight and unobtrusive. Mini Cams often do not store data but continually output to another device such as a dedicated recorder, computer, or video monitor. Mini Cams are useful as security cameras.
Datarate/hour: 2 gigabytes
Mass: 50 g
Cost: ¥500

Winch (Powered)
Powered winches are a made up of a engine or motor that winds a steel cable around a spool. Winches are useful for removing light obstructions, getting vehicles, animals, or people out of conditions that they normally would not be able to get out of by themselves.
Electrical winches can be attached to a vehicle or strapped to a sturdy enough object. Although not strong enough to pull a

heavy vehicle, a winch can apply enough force to aid the vehicle in traversing obstructions.
Mass: 30 Kg
Cost: ¥2,000

Scientific Hardware

Animal Tracking Tags

When studying the behavior of animals it is useful to monitor their movement over long periods of time. Animal tracking tags allow the animal to be located and identified by a broadcast radio signal with a distinctive pattern. Tags are similar in size and thickness to a credit card and are flexible so that they may be bent. On one side of the card is a battery of solar cells and on the other is a dielectric that when touching the skin of the subject animal will produce low level electric current. Tags can either be glued on to small or smooth skinned animals, or they can be mechanically fastened to an animals ear. Tags are designed to have a long life span rather than a powerful signal so the biologist tracking the animal must often get within one kilometer of the study subject to pick up the radio signal.
Battery life: 6 months
Mass: 100 g
Cost: ¥2,000

Atmospheric Instrumentation

This suite of devices gives accurate data on the atmospheric conditions in the local area.

Wind Speed Meter
Gives the average wind speed along with the gust speed.

Precipitation Gauge
Measures the hourly precipitation by taking a ten minute sample and then extrapolating the total.

Barometer
Measures the atmospheric pressure.

Thermometer
Measures the local temperature.

Hygrometer
Measures the relative humidity of the air.

Mass: 800 g
Cost: ¥6,000

Centrifuge

A centrifuge is a device that uses centrifugal force to separate solids suspended in liquid media into it's component parts.
Mass: 2.1 Kg
Cost: ¥24,000

Electron Microscope

The electron microscope bounces electrons off an object to create an image. The electron microscope is able to image objects that are far too small to be small to be seen with a traditional microscope because the wavelength of light is larger than the subject being observed. Multiple magnetic mirror electron microscopes have allowed the imaging of individual atoms and can observe molecule by molecule atomic reactions.
Mass: 600 Kg
Cost: ¥240,000,000

Gas Chromatograph / Mass Spectrometer

The GC/MS is a device that can determine the molecular composition of most materials. From that composition, a database of materials can be referenced and unknown materials can be identified. The GC/MS can also be used to test the purity of air and water with very high precision.

A Gas Chromatograph is a device that separates a sample of gaseous or liquid material, into its component gases. A mass spectrometer then measures the mass of the sample and bombards the sample with ions. It is then able to determine what the chemical composition of the materials that is in the sample.

Solids can be processed through a gas chromatograph by dissolving a material in a known solution. The solution is then negated from the results and what is left is the solid matter.
The resulting chemical composition is then compared against a database that can identify the material by chemical composition and the quantities of the chemicals in the sample.

The GC/MS requires a sample of gas or liquid to be at least three microliters or a solid to be one half gram to one gram in mass. The process takes at least one hour but may take more for very complex substances.
Mass: 16 Kg
Cost: ¥640,000

Interference Microscope

The interference microscope is a microscope that uses fast phase variations in two beams of light. The resolution limit of a normal microscope is due to the wavelength of

light being larger than the object being observed. The fast phase variation of the interfering beams of light allows measurements that are impossible for normal light. The interference microscope can see at much higher resolution (on the nanometer scale) than an optical microscope because it uses an interference pattern of two light beams to measure the subject.
Mass: 13 Kg
Cost: ¥30,340,000

Isolating Glove Station

These shatterproof glass boxes have integrated coated neoprene gloves that can be used to manipulate an object inside the box. The box is sealed so as to be air tight and coated to reduce heavy particle radiation. Most biohazards can be safely manipulated inside the glove station.
Mass: 15 Kg
Cost: ¥50,000

Laser Ablation Spectrometer

The Laser Ablation Spectrometer functions much as the Gas Chromatograph / Mass Spectrometer but needs far less of a sample to perform an analysis. The Laser Ablation Spectrometer uses a pulsed laser to vaporize a tiny portion of the sample without prior preparation. The sample can be gas liquid or solid. Even very hard solids will usually emit some form of gas in miniscule amounts. The Laser Ablation Spectrometer is easier to use with solids than a traditional GC/MS because solids do not need to be dissolved and therefore the dilution media does not need to be subtracted from the results.

The resulting chemical composition is then compared against a database that can identify the material by chemical composition and the quantities of the chemicals in the sample. The Laser Ablation Spectrometer requires a sample of gas or liquid to be at least one hundred picoliters or a solid to be one tenth of a gram. The process takes at least one hour but may take more for very complex substances.
Mass: 18 Kg
Cost: ¥1,230,000

Oscilloscope

Oscilloscopes are used to observe electrical waveforms, their frequency and amplitude. The Oscilloscope can be used to observe most waveforms by connecting it to a device that generates an electrical signal from the wave. For example a microphone can be connected to an Oscilloscope and the sound wave can be observed.
Mass: 8 Kg
Cost: ¥6, 680

Portable X-ray gun

Used for looking inside an object without having to open it. The X-ray image shows the relative density and reflectivity of objects inside. Can be used as a medical device or to examine mechanical or electronic devices without disturbing them among other things.
Mass: 5 Kg
Cost: ¥50,000

Protein Expression Analyzer

This device samples a large array of biological tissues and tests for the expression of proteins such as DNA and RNA. The device can simultaneously study the effects of DNA damage, oxidative stress, and various metabolic inhibitors on gene expression. The device can obtain an expression profile of your target gene and gain insight into how it may function. This can enable the production of medicines to block viral and bacteriological pathogens or to develop treatments for genetic diseases.
Mass: 23 Kg
Cost: ¥560,000,000

Variable Electrical Power Supply

At times, when studying electronic devices it is useful to be able to apply electrical current to only a portion of a device to determine its function. In other instances, the normal power supply of a device might not be available. This lab quality power supply can generate DC power from the milivolt range up to approximately 12,000 volts from the Artifact power grid. It can also generate AC current in the same range and can vary the frequency of the output.

The power supply does not generate electrical power, it merely conditions it to meet the need of the electrical device being studied. The power supply is designed to take input from The Artifact's power grid but alternately can be supplied by an AC generator.
Mass: 65 Kg
Cost: ¥31, 760

Defensive Systems

Anti-Plasma Fence

These are actually a row of electromagnetic posts that are erected around a semi-permanent or permanent camp. Developed by the I-CA, these barriers create an electromagnetic field that draws plasma fire. The posts are armored to withstand the punishment of drawing the plasma. Since plasma weapons use magnetic fields to deliver their destructive payloads, the Anti-Plasma fence disrupts that field which attracts and dissipates the plasma.

This fence system draws a large amount of power and requires it to be connected to the Artifact's power grid.

Posts are most effective when placed two meters apart. The barrier is operational until at least two consecutive posts have been destroyed. This opens a corridor for plasma fire, but does not disable the entire fence. Only destroying all of the posts or cutting the power supply will completely nullify the fence.

The I-CA sells these fences to Corporations and the Scimrahn. The ASO has copied the design and is deploying their own version which is nearly identical.

AR: 30
HP: 150 per post
Height: 4 m
Diameter: 20cm
Mass: 100 Kg per Post
Cost: ¥1000 per Post

Anti-plasma Infrared Guided Micro Missile Launcher

Infrared guided micro missiles are armed with a low yield explosive warhead. An infrared heat seeking guidance system controls them. There is no user intervention other than deploying the missile. The micro missiles automatically target the most powerful plasma stream in its current fire arc.

The launcher is most often mounted on E-suits, but there have been a number of these units mounted on Scimrahn Deltas.

Guidance System
Percent to hit: 75%
Effect: Disrupts 1D10 x70 points of plasma damage per missile on a successful intercept.

	PB	S	Med	L	Ex
Damage:	40	20	10	5	1

Blast Range Class: A
Range Class: C
Payload: 10
Mass: 280.3 Kg
Rocket Mass: 5.1 Kg
Cost: ¥1,500,000
Missile Cost: ¥826,000

Chaff

Chaff is a defensive countermeasure that uses a small explosive device to disperse a cloud of highly reflective treads. This cloud scatters electro-magnetic and photon energy in random directions, confusing radar and reducing the effectiveness of lasers

Chaff rounds are available for grenade launchers and 20mm guns.
Effect: Chaff rounds create a negative modifier for optics in a 300 meter radius and an additional negative modifier to hit a target with a laser weapon.

	PB	S	Med	L	Ex
Optics PDF:	-50	30	-15	-10	-5
Laser PDF:	-20	-15	-10	-5	-1

Blast Range Class: B
Mass: 300 g
Cost: ¥5,400

Concertina Wire

These spools of razor edged wire are quickly strung across an enemy's path. Concertina Wire is also called razor wire because of it's razor sharp edges. Even if an enemy is armored, the wire can entangle the subject.
Effect: does one point of damage. If the Concertina Wire does damage to an animal or person they must make a Con roll to keep walking or running. Victims are entangled. If a victim is entangled they must make a Agi roll under their 1/4 fraction column to escape or suffer one point of damage for each failed attempt to escape.

Save vs. entanglement: Agility roll. Must roll under the victim's Agi to avoid entanglement.
Cost: ¥100 per 70 meters

IR Flare Decoy

The IR flare is similar to an illuminator Grenade but the IR flare emits mainly infra-red light. The light is bright enough drown out any other sources of low intensity infrared such as vehicles and humans that are near the flare.

The launcher for these flares is a simple aluminum tube with an electrical trigger that can be wired into a vehicles electrical system.

Effect: The IR Flare makes it very difficult to target any object inside the effect radius with Infrared Optics.

	PB	S	Med	L	Ex
Optics PDF:	-70	-50	-30	-10	-5

Blast Range Class: C
Range Class: A
Mass: 400 g
Cost: ¥4,000

Flares
Mass: 75 g
Cost: ¥8,000

Multiple Flare IR Decoy

The Multiple IR Flare Decoy creates a larger field effect than a single flare. Multiple flare launchers are mounted to a vehicle and triggered by an electrical button switch or trigger device.

Effect: The IR Flare makes it very difficult to target any object inside the effect radius with Infrared Optics.

	PB	S	Med	L	Ex
Optics PDF:	-70	-60	-40	-20	-5

Blast Range Class: B
Range Class: A
Mass: 400 g
Cost: ¥4,000
F l a r e s
Mass: 75 g
Cost: ¥8,000

Personal ECM System

The Personal ECM system is designed to combat the FCS and AFCS systems but is also effective against cameras, video cameras, telescopic and infrared optics. The unit is attached to the belt or shoulder. A low intensity laser system scans a thirty (30) degree cone in front of the weapon. The unit scans for a phenomenon known as "Sensor-Retroreflectivity". This phenomenon can be illustrated as being similar to the glow in an animal's eye at night when a light is shined at it. The Personal ECM System looks for this phenomenon and fires an argon laser at the optic. There is no roll to strike since the system handles this. When an optics system is targeted by the ECM system. Microabrasions in the optics glass scatter this particular wavelength of light turning the entire lens a glaring, opaque green. As a result, a sniper could not see through their scope, an FCS operator could not, with any accuracy lase their target and a AFCS could not see targets.

The ECM has a 60% chance of identifying and neutralizing optics. The ECM can simultaneously effect all optics systems in its scanning cone, but a percentile roll must be made for each target.
Battery Life: 6 Hours
Mass: 1.1 Kg
Cost: ¥140,000

Smoke Grenade

	PB	S	Med	L	Ex
Vision PDF:	-70	-50	-30	-10	-5

Blast Range Class: A
Mass: 175 g
Cost: ¥4,000

Archaic Weapons

Baton

These are simple weapons used to cause pain and dissuade a target from further aggression. Also called nightsticks, these clubs are used by police to subdue criminals. A wide verity of batons are available, from the police like side handle baton to telescoping spring batons.
Damage: 2 points
Parry: -10
Mass: 750 g
Cost: ¥300-900

Blowgun

A blowgun is a long narrow tube that is used to guide small darts. The user blows into the tube. This forces the dart down the tube and propels it through the air.

Blowgun darts are good for hunting very small prey by themselves. However with the addition of a poison or sedatives applied to the tip of the dart, much larger targets may be taken down.

	PB	S	Med	L	Ex
Damage	2	2	2	2	1

Range Class: A
Payload: 1
Rate of Fire: 1
Mass: 50 g
Cost: ¥1,000

Bola

A bola consists of two weights tied to either end of a rope. The Bola is swung in a circular motion over the head. When released, the bola spins as it flies. On striking a target,

the bola wraps around and entangles limbs. The bola is effective in entangling even large animals such as cattle.
Effect: The Bola entangles it's victim and when the weights fully wrap around the victim can stun the victim. Roll for normal hit location. If the Bola strikes the legs, the victim cannot walk, and must make a Agi roll to keep standing. If the Bola strike the arms or chest the victim cannot use their arms. If the Bola strike the head double the damage as normal. If the Bola does damage the victim must save versus stun as normal.
Damage: 1
Range Class: A
Parry: -10
Mass: 1 Kg
Cost: ¥400

Bow

The bow in its simplest form is a wooden shaft that is bent to put tension on a cord. An arrow with a notch in the back is placed on the cord. The cord is then pulled back which bends the wood shaft further and creates tension. That tension is then released when the cord is released propelling the arrow toward its target.

Most modern bows are called recurve bows because of two inversely curved segments on the ends of the bow.

Bows are very quiet but not silent.

	PB	S	Med	L	Ex
Damage	8	8	7	4	2

Range Class: B
Payload: 1
Rate of Fire: 1
Mass: 500 g
Cost: ¥6,000

Bullwhip
Damage: 2 points
Parry: -40
Ensnare: Agi + WS Whip
Mass: 500 g
Cost: ¥200-400

Caltrops

Caltrops are four pointed metal spikes. Three spikes will rest on the ground while one of the spikes points straight up. The points are arranged so that when dropped, one point will always stay up. A number of caltrops are usually dropped in clusters in the path of a wheeled vehicle, animal or humans. The caltrops do not do any significant amount of damage, but impede motion.

The victim has a saving roll to notice the caltrops (roll vs. Int) but will have a much harder time if on an animal or in a vehicle (-40 to Int).

Requires 20 caltrops per square meter to be effective.
Effect: does one point of damage per step up to 5 points. The points however are sharp enough to pierce anything up to AR 5 due to the weight of a human body pressing into the point or will pierce anything up to AR 15 for any vehicle or animal over 500 kg. If the caltrop does damage to an animal or person they must make a Con roll to keep walking or running. If the caltrop does damage to a wheeled vehicle treat the damage as a critical hit to the vehicles drive system.
Cost: ¥100 per 20

Compound Bow

The compound bow uses mechanical tension from a spring instead of tension generated by the wood shaft in a regular bow. The mechanical tension is created by a system of pulleys and creates a "draw" with a high tension at the beginning and a lower tension at the end. This makes the bow easier to aim by allowing the user to hold the cord back for extended periods.

Bows are very quiet but not silent.

	PB	S	Med	L	Ex
Damage	9	9	8	5	2

Range Class: B
Payload: 1
Rate of Fire: 1
Mass: 550 g
Cost: ¥7,000

Composite Bow

Composite bows create tension through a large cam that rotates when the bowstring is drawn. Like the Compound bow, the Composite bow creates a high tension at the beginning of the draw but lowers toward the end of the draw. The drop in tension is greater in a Composite Bow than a Compound and therefore allows the same user to use a bow with a greater draw.

Bows are very quiet but not silent.

	PB	S	Med	L	Ex
Damage	10	9	8	5	3

Range Class: B
Payload: 1
Rate of Fire: 1
Mass: 550 g

Cost: ¥8,000

Arrows
Broadhead arrows are used in most types of hand drawn bows.
Cost: ¥80 per arrow.

Double sided axe
Damage: 20
Parry: -10
Mass: 2-5 Kg
Cost: ¥3,000-10,000

Sjambok
Tool used in Africa as a cattle prod, riding crop, a whip and a self-defense weapon. The Sjambok is a flexible shaft wrapped in leather, It is swung like a stick and is very effective against small animals because of its speed and accuracy.
Damage: 2 points
Parry: -20
Mass: 500 g
Cost: ¥200-400

Slingshot
A Slingshot uses elastic bands to launch small objects.

	PB	S	Med	L	Ex
Damage	6	6	4	2	1

Range Class: A
Payload: 1
Rate of Fire: 1
Mass: 50 g
Cost: ¥1,000

Sling
A Sling is a pouch with cords attached. It is swung or snapped to launch fist sized rocks at great speed. This weapon can be made with very little resources and it's ammunition can consist of rocks or hard clay balls.

WS Sling (2) - A Sling cannot be used without having the WS Sling skill. Although an effective weapon, it is very hard to learn to use accurately.

	PB	S	Med	L	Ex
Damage	10	10	9	7	5

Range Class: B
Payload: 1
Rate of Fire: 1
Mass: 10 g
Cost: ¥1

Spear
Damage: 15
Parry: -10
Mass: 4-5 Kg
Cost: ¥3,000-5,000

Sword
Damage: 15
Parry: 0
Mass: 3 Kg
Cost: ¥2,000-10,000

Throwing Knife
Damage: 7
Parry: -30
Mass: 100-250 g
Cost: ¥1,500-3,000

Throwing Axe
Damage: 12
Parry: -15
Mass: 1.5-2.5 Kg
Cost: ¥3,000-7,000

ASO / I-CA Weapons

10 Gauge shotgun

	PB	S	Med	L	Ex
Damage	25	18	15	10	8

Range Class: A
Payload: 1-2-6
Rate of Fire: 2
Mass: 2.8 Kg
Cost: ¥7,000

10 Gauge Ammunition (200 rounds)
Cost: ¥1,500

Derringer Pistol

The Derringer Pistol is most often a single shot weapon designed for concealability. They often consist of a two to three centimeter barrel and a guardless trigger.

	PB	S	Med	L	Ex
Damage:	8	7	5	2	1

Range Class: A
Payload: 1
Rate of Fire: 1
Mass: 30 grams
Cost: ¥4,000

High Caliber Pistol

	PB	S	Med	L	Ex
Damage:	11	11	10	8	5

Range Class: B
Payload: 10
Rate of Fire: 5
Mass: 1 KG
Cost: ¥12,000

Low Caliber Hunting Rifle

Low caliber hunting rifles are used to hunt small prey such as rodents. These weapons are lightweight as is their ammunition. Ammunition for these rifles is often very affordable.

	PB	S	Med	L	Ex
Damage:	8	8	7	5	2

Range Class: B
Payload: 1-10 (often 1 or 5)
Rate of Fire: 2
Mass: 2 KG
Cost: ¥10,000

Medium Caliber Hunting Rifle

Medium caliber hunting rifles are often used to hunt medium to large prey.

	PB	S	Med	L	Ex
Damage:	10	10	9	8	5

Range Class: B
Payload: 1-10 (often 1 or 5)
Rate of Fire: 2
Mass: 2.8 KG
Cost: ¥10,000

High Caliber Hunting Rifle

High caliber hunting rifles are meant for hunting large to very large prey. Ammunition for these rifles can be very expensive.

	PB	S	Med	L	Ex
Damage:	15	15	12	10	5

Range Class: B
Payload: : 1-10 (often 1 or 5) Rate of Fire: 2
Mass: 4.5 Kg

Cost: ¥30,000

Low Caliber Sniper Rifle

Low caliber sniper rifles use high power rounds to propel the slug a great distance.

The damage listed below is for a standard round, these weapons are most often used with armor piercing rounds. See: Rifle Ammunition, Armor Piercing.

	PB	S	Med	L	Ex
Damage:	10	10	9	8	5

Range Class: C
Payload: 10-30
Rate of Fire: 2
Mass: 2.1 KG
Cost: ¥10,000

Medium Caliber Sniper Rifle

The medium caliber sniper rifle has slightly better stopping power due to the mass of the bullets it fires but is little better at extended ranges due to increased drift and a more dramatic drop off in the projectile's velocity over a distance.

The damage listed below is for a standard round, these weapons are most often used with armor piercing rounds. See: Rifle Ammunition, Armor Piercing.

	PB	S	Med	L	Ex
Damage:	12	12	10	8	5

Range Class: C
Payload: 10-30
Rate of Fire: 2
Mass: 2.8 KG
Cost: ¥10,000

High Caliber Sniper Rifle

High caliber sniper rifles saw their first uses nearly a hundred years ago in the attempt to defeat improving vehicle armor. These weapons have also been found effective anti-sniper and EOD (Explosive Ordinance Disposal) weapon because of their high level of penetration. The weapon is effective in counter sniping when the target is under hard cover. They have actually been shown effective at shooting through cover to remove the sniper threat. It's EOD role is both because of the weapon's long range accuracy and its ability to hit buried targets from a distance.

High caliber sniper rifles often require a bipod to be fired accurately because of their high recoil. Without a bipod, high caliber sniper rifles have an effective range class of B.

The damage listed below is for a standard round, these weapons are most often used with zirconium tipped rounds. See: Rifle Ammunition, Armor Piercing Incendiary.

	PB	S	Med	L	Ex
Damage:	20	20	18	16	10

Range Class: C with Bipod
Range Class: B without Bipod
Payload: 10
Rate of Fire: 3
Mass: 4.5 Kg
Cost: ¥30,000

Assault Weapon / Submachine Gun

The Assault Weapon is the primary infantry weapon for more than a hundred years. The trend has been to produce lighter more accurate weapons. Thousands of designs have been produced many have variants for special purposes such as for use by paratroopers or as a personal defense weapon for pilots of vehicles. These variants are often lighter with collapsible stocks. Many modern assault weapons have "component systems" that expand the role of the weapon such as bayonets, attachable grenade launchers, and in the case of the G-82 (see: The Artifact, Equipment) there is the AVW rocket launcher. More modern weapons have computers built into their sights that can perform a series of functions.

Assault weapons differ from sub-machine guns in that the user can select the firing mode of the weapon. Nearly all weapons have a single round mode for sniping and extended range fire and a burst mode that fires two (2) to five (5) rounds dependent on the weapon. A large majority of assault weapons also have a fully automatic mode that will continue to fire as long as the trigger is pulled and there are rounds in the magazine.

Modern weapons are often of the "bullpup" configuration, meaning that the magazine and therefore the firing chamber is behind the trigger mechanism. This serves to make the weapon more stable when firing. This however is not always the case especially noteworthy is that neither the ASO nor I-CA weapons are of this configuration.

Ammunition for assault weapons can be either standard cased rounds or the more modern caseless rounds (See: Rifle Ammunition, Caseless Rounds). However one weapon cannot fire both interchangeably. The advantage of cased ammunition is the resilience of the ammunition and weapon. Weapons firing cased rounds are more rugged

and can better withstand extreme environments. Weapons firing caseless rounds need to have very strict conditions in their firing chamber (i.e. no moisture or dust). The advantage of caseless rounds is lighter weight ammunition because there is no heavy brass and a higher rate of fire because the weapon cuts out the step of ejecting the case. All weapon stats are given for cased rounds.

This category is called Assault "Weapons" because the class is very broad. Some are classified as rifles and others as carbines. For game purposes the distinction is not important but for accuracy, the more general term is used.

Low Caliber Assault Weapon

The low caliber assault weapon is the choice of most modern militaries. The small caliber is usually the 5.56mm NATO standard round. The advantage of smaller caliber is greater accuracy at longer ranges and better armor penetration.

	PB	S	Med	L	Ex
Damage:	10	10	9	8	5

Range Class: B
Payload: 30
Rate of Fire: 15
Mass: 2.56-3.9 Kg
Cost: ¥12,000

Medium Caliber Assault Weapon

Medium caliber weapons are still in use by a select few armies in 2085. Most notably is the Chinese AK-140 developed in 2040 and still in use today. They have greater stopping power than low caliber weapons but they are less accurate at longer ranges.

	PB	S	Med	L	Ex
Damage:	12	12	10	8	4

Range Class: B
Payload: 30
Rate of Fire: 15
Mass: 4.3 KG
Cost: ¥12,000

Optional Weapon Systems for Assault Weapons

The first optional weapon system for an infantryman's gun was the bayonet. This addition was indispensable for the early gun since they were unreliable and only fired a single shot. However as guns became the primary battlefield armament, the bayonet became less important. The history of optional weapon systems dries up until the under barrel grenade launcher was introduced. At the end of the 21st century the integrated Fire Control System (see: FCS) greatly enhanced the functionality of the grenade launcher, HEAP Guns and rocket propelled rounds.

Under Barrel Grenade Launcher

Under barrel grenade launchers are often 40mm or 37mm grenades that use a high-low pressure system that allows the propellant to develop a relatively high pressure in a high-pressure chamber before venting gases into a low pressure chamber in the grenade cartridge case. The under barrel grenade launcher is a single-shot, muzzle-loading weapon. It has a protected fixed front sight and a rear leaf sight that is adjustable for windage.

This optional system is among the oldest of assault weapon modifications. The oldest of these weapons are incompatible with FCS systems. However the under barrel systems that are available for the AK-140 are able to use FCS systems. There is no under barrel grenade launcher for the G-82 assault weapon.

Damage: See Grenades
Range Class: B
Payload: 1
Rate of Fire: 1
Mass: 1.1 Kg
Cost: ¥25,000

Under Barrel 20mm Gun

The under barrel 20mm gun is a short range weapon designed to fire high explosive air bursting rounds or high explosive armor piercing rounds. The 20mm gun has significant recoil making it difficult to fire accurately at a distance.

High Explosive Air Bursting

	PB	S	Med	L	Ex
Damage:	40	25	8	2	1

Blast Range Class: A
Range Class: B

Ammunition
Mass: 100 g
Cost: ¥1,600

High Explosive Armor Piercing

	PB	S	Med	L	Ex
Damage:	50	50	40	30	10

Range Class: B
Payload: 3
Rate of Fire: 1

Mass: 1.6 kg
Cost: ¥135,000

Ammunition
Mass: 100 g
Cost: ¥2,000

Under Barrel 12 Gauge Shotgun
This is a cut down version of a 12 gauge shotgun. It is fully functional as such but cannot be aimed and is inaccurate due to it's short barrel (-10 modifier to hit). This optional weapon system is incompatible with FCS systems.

Use statistics for a 12 gauge shotgun found in The Artifact Gamebook (pg. 185).
Mass: 1.4 Kg
Cost: ¥3,500

Over Barrel Grenade Launcher

The grenades used for the over barrel launcher are slightly smaller than those used in the under barrel launcher, but are longer and therefore carry the same payload. The majority of these weapon systems use a three round tubular magazine and one grenade is inserted into the barrel giving the weapon a four round capacity.

Over barrel weapons are only available to assault weapons that do not have a built in stock. This is because the over barrel weapon acts as the stock of the assault weapon.
Damage: See Grenades
Range Class: B
Payload: 4
Rate of Fire: 1
Mass: 3.9 kg
Cost: ¥6,000

Over Barrel 20mm Gun

The over barrel 20mm gun uses a longer barrel than it's under barrel counterpart. It uses gas compensators to vent off some of the gas that causes excessive recoil on the under barrel version. This weapon is designed to fire high explosive air bursting rounds or high explosive armor piercing rounds.

Over barrel weapons are only available to assault weapons that do not have a built in stock. This is because the over barrel weapon acts as the stock of the assault weapon.

High Explosive Air Bursting

	PB	S	Med	L	Ex
Damage:	40	25	8	2	1

Blast Range Class: A
Range Class: C

Ammunition
Mass: 100 g
Cost: ¥1,600

High Explosive Armor Piercing

	PB	S	Med	L	Ex
Damage:	50	50	40	30	10

Range Class: C

Ammunition
Mass: 100 g
Cost: ¥2,000

Payload: 6
Rate of Fire: 3
Mass: 3.6 kg
Cost: ¥245,000

Over Barrel Rocket Launcher

This kind of optional system is rare. A notable exception is the G-82 but the majority of modern assault weapons forgo the rocket-propelled weapons for HEAP guns for better payload and ease of use. There has also been the problem of a rocket's backwash injuring the user or friendly forces as the weapon is fired. These optional weapon systems use a "cold launch" system that propels the rocket fifteen meters and then the primary rocket fires. This kind of system is sophisticated and expensive.

Over barrel weapons are only available to assault weapons that do not have a built in stock. This is because the over barrel weapon acts as the stock of the assault weapon.

	PB	S	Med	L	Ex
Damage:	200	150	100	50	10

Blast Range Class: A
Range Class: D
Payload: 2
Mass: 5.2 KG
Black Market Cost: ¥1,000,000

Rocket Mass: 4.3 KG
Black Market Cost: ¥5,000

Over Barrel HEAP Gun

Although 20mm guns fire HEAP (high explosive armor piercing) rounds, the HEAP gun fires a more powerful round and uses a recoilless design to allow for accurate fire.

Over barrel weapons are only available to assault weapons that do not have a built in stock. This is because the over barrel weapon acts as the stock of the assault weapon.

	PB	S	Med	L	Ex
Damage:	60	60	50	40	20

Range Class: C
Payload: 5
Rate of Fire: 2
Mass: 5.1 kg
Cost: ¥165,000

Ammunition
Mass: 180 g
Cost: ¥2,500

Low Caliber Sub-machine pistol

The sub machine pistol is often seen in guerilla combat and are often seen in urban environments were close combat is likely. Sub machine pistols often have a prodigious rate of fire, sacrificing accuracy and aiming for a hail of fire. Low caliber weapons are easier to handle because of lower recoil and therefore enable longer effective bursts.

	PB	S	Med	L	Ex
Damage:	10	10	9	8	5

Range Class: A
Payload: 10-50
Rate of Fire: 30
Mass: 900 g-2.54 kg
Cost: ¥12,000

Medium Caliber Sub-machine pistol

The sub machine pistol is often seen in guerilla combat and are often seen in urban environments were close combat is likely.

Medium caliber sub machine pistols have very good stopping power. Their heavier slugs reduce the number of rounds that can be accurately fired in a round due to their high recoil.

	PB	S	Med	L	Ex
Damage:	12	12	10	8	4

Range Class: A
Payload: 10-30
Rate of Fire: 20
Mass: 900 g
Cost: ¥12,000

Low Caliber Machine Gun

The low caliber machine gun is used to provide heavy firepower and still be portable by a single footsoldier. Because of the high rate of fire of these weapons it is nearly impossible to fire anything other than short bursts (under 15 rounds) when standing. However light machine guns often have built in bipods that can be used in a prone firing position.

	PB	S	Med	L	Ex
Damage:	10	10	9	8	5

Range Class: C with Bipod
Range Class: B without Bipod
Payload: 25-100 belt
Rate of Fire: 30
Mass: 8 Kg
Cost: ¥20,000

Medium Caliber Machine Gun

Medium machine guns are often just on the border of what a single footsoldier can carry. Many forces will have one soldier carry the weapon and the other carry the ammunition boxes. Medium machine guns are nearly impossible to fire standing unless mounted in some way. It is most common to see them used with a built in bipod in a prone position, but tripods are preferable if a base of fire is to be established.

	PB	S	Med	L	Ex
Damage:	15	15	12	10	8

Range Class: C with Bipod
Range Class: B without Bipod
Payload: 25-100 belt
Rate of Fire: 30-60
Mass: 9-20 Kg
Cost: ¥20,000

High Caliber Machine Gun

High caliber machine guns are often mounted to vehicles or serviced by a crew of up to five footsoldiers. There is no way that a high caliber machine gun can be fired from a standing position and even a bipod is not enough to stabilize these weapons. Often sandbags hold a tripod down as these monsters churn out fire. These guns are sometimes employed in an anti-aircraft function.

	PB	S	Med	L	Ex
Damage:	20	20	18	16	10

Range Class: C
Payload: 25-100 belt
Rate of Fire: 30-60
Mass: 20-38 Kg
Cost: ¥20,000

Gun Platform

These are small-automated weapon systems that have a simple motion detector

that scans a 30-degree cone in front of the platform. Any motion will trip the system and the weapon will aim at the last point of motion. When there are multiple moving objects the gun platform can split its fire between targets. The Gun Platform does not distinguish between a moving person and a backpack thrown in front of it. It does however look for an object that is at least 20cm in diameter.

The gun platform fires five round bursts at each target. It will continue to fire until the target has stopped or has moved out of its 30-degree cone.

The gun platform is transported in a protective case that can be carried like a briefcase. When deployed the top of the case is removed and set aside.

An optional communications package can be added on to the system to give a user the ability to "pull the trigger". This way the user can designate when the system should fire.

Ref: 66
Agi: 60
Actions: 3

	PB	S	Med	L	Ex
Damage:	10	10	9	8	5

Range Class: B
Payload: 200
Rate of Fire: 20
Mass: 45 KG
Cost: ¥520,000

Optional Communications Package
Cost: ¥40,000

Grenade launcher

Grenade Launchers fire 40mm grenades at greater velocities and distance than by being thrown. While these launchers do not use the typical hand grenades in most foot soldiers standard issue, the 40mm grenades have the same effect as their counterparts.
Damage: See Grenades
Range Class: B
Payload: 1
Rate of Fire: 1
Mass: 3.1 Kg
Cost: ¥6,000

Rocket Propelled Grenade (RPG)

Mostly outmoded in modern warfare, the Rocket Propelled Grenade is seen in use in third world countries and criminal organizations. The RPG as it is most often referred to is a seventy (70) to eighty (80) millimeter grenade with a forty (40) millimeter cylindrical rocket engine attached. The launcher is most often a one meter long tube with two handles and an attached scope for aiming. The grenades carry a mediocre punch but are only accurate at short ranges.

	PB	S	Med	L	Ex
Damage:	170	100	60	20	1

Blast Range Class: A
Range Class: B
Payload: 1
Mass: 6.2 KG
Grenade Mass: 2.11 KG
Cost: ¥400,000

Disposable Antitank Rocket Launcher

Disposable antitank weapons are single shot weapons that carry a sixty (60) to seventy (70) millimeter rocket inside a fiberglass reinforced plastic tube. The tube telescopes to its full length and is ready to fire. These weapons have short effective ranges.

	PB	S	Med	L	Ex
Damage:	150	80	30	10	1

Blast Range Class: A
Range Class: B
Payload: 1
Mass: 3.3 KG
Cost: ¥200,000

Recoilless Flame-thrower

The Recoilless Flame-thrower is a shoulder-fired weapon. It fires rocket-propelled napalm rounds. The RPO is reusable and can be fired at a rate of one shot per minute. The Recoilless Flame-thrower is effective as antitank weapons, "bunker-busters," and against troop formations.

Effect: When used against vehicles the high heat of the napalm round has a 10% chance of a crew critical hit, a 10% chance of a fuel supply critical hit for vehicles with explosive fuels or plasma, and a 10% chance of an ammo explosion regardless of hit location and armor rating.

The napalm in the round will continue to burn for 2D10 turns and will continue to do damage to targets that were hit even after they have left the blast radius. This is due to the napalm sticking to the target.

	PB	S	Med	L	Ex
Damage:	30	30	30	10	5

Blast Range Class: A

Range Class: B
Payload: 1
Rate of Fire: 1/6
Mass: 3.5 KG
Cost: ¥400,000

Ammunition
Mass: 5.2 KG
Cost: ¥20,000

White Phosphorus Grenade

White phosphorus is an elemental form of phosphorus that bursts into flames in the presence of water or when heated significantly. The element burns so hot that it is an effective anti-armor weapon. International treaties restrict the use of white phosphorus devices on personnel and only on their equipment.

	PB	S	Med	L	Ex
Damage:	150	75	30	10	3

Blast Range Class: A
Mass: 175 g
Cost: ¥13,000

Artillery Weapons

Artillery can be defined as simply as large firearms. However for the purpose of this book, artillery will be defined as firearms that are too large or powerful to be carried as a sidearm. The majority of weapons listed here is intended for mounting on vehicles or structures and cannot be carried or fired without doing so.

Crew Serviced Weapon

These weapons are small artillery that can be carried and operated by a crew of as little as two but more often three to five soldiers. They are more easily transported and operated than heavy machine-guns and are more effective against lightly armored targets. They can fire either range-fused air bursting munitions, or high explosive armor piercing (HEAP) rounds.

High Explosive Air Bursting

	PB	S	Med	L	Ex
Damage:	60	35	16	4	1

Blast Range Class: A
Range Class: C

High Explosive Armor Piercing

	PB	S	Med	L	Ex
Damage:	80	80	70	65	40

Range Class: C
Payload: 31 per can
Rate of Fire: 5
Mass: 14.5 Kg
Cost: ¥300,000
7 Kg per 31 round can

Recoilless Rifle

The recoilless rifle is a light weapon designed to be mounted on light trucks, transports, or as a towed weapon.

	PB	S	Med	L	Ex
Damage:	80	80	70	60	40

Range Class: C
Payload: varies by installation, (50-100 rounds)
Rate of Fire: 1
Mass: 80 Kg
Cost: ¥310,000

Light Automatic Cannon

Light ordinance automatic cannons are often seen as a towed weapon system or mounted on light naval craft. Air bursting munitions are often employed for anti-aircraft roles.

	PB	S	Med	L	Ex
Damage:	80	80	70	60	40

Range Class: D
Payload: varies by installation, (50-1,000 rounds)
Rate of Fire: 15
Mass: 290 Kg
Cost: ¥470,000

Machine Gun Grenade Launcher

These weapons are designed to give a small unit the ability to deliver suppressive fire to large areas at a distance. The machine gun grenade launcher class of weapons is effective against lightly armored vehicles and in lowering force fields. These systems use 40mm grenades. There is no way that these weapons can be fired from a standing position and even a bipod is not enough to stabilize them. Often a tripod is sandbagged to hold them down as they fire or they are mounted to a vehicle. These guns are sometimes employed in an anti-aircraft function.
Damage: See Grenades
Range Class: C
Payload: 20 round belt
Rate of Fire: 8
Mass: 31.5 Kg (with tripod 60.1 Kg)
Cost: ¥6,000

Recoilless Automatic Cannon

The recoilless automatic cannon is a light ordinance weapon that is designed for light vehicles such as transports, trucks, small naval vessels and aircraft.

	PB	S	Med	L	Ex
Damage:	80	80	70	60	40

Range Class: D
Payload: varies by installation, (50-100 rounds)
Rate of Fire: 4
Mass: 563 Kg
Cost: ¥760,000

Medium Automatic Cannon

Medium ordinance automatic cannons are externally powered cannons designed for mounting on vehicles such as APCs medium sized naval vessels or tanks. Their recoil is often too much for lighter framed vehicles such as transports or trucks.

	PB	S	Med	L	Ex
Damage:	100	100	90	70	50

Range Class: D
Payload: varies by installation, (50-300 rounds)
Rate of Fire: 7
Mass: 575 Kg
Cost: ¥530,000

Heavy Ordinance Close-In Weapons System

These large emplacement weapons are high caliber gatling cannons. They are most frequently used in naval vessels to protect against incoming missiles, small surface craft, surface mines and aircraft. These systems usually have independent radar system and forward looking infrared radar for tracking individual threats. Some of these weapon systems are capable of autonomously detecting, tracking and assess the success of a kill.

The CIWS fires four, three hundred (300) round bursts at each target. It will continue to fire until the target has been destroyed or moves out of range.

The damage statistics given are for standard rounds. However the CIWS is most often armed with Armor Piercing Discarding Sabot (APDS) rounds, or Depleted Uranium sub-caliber penetrator

Ref: 66
Agi: 60
Actions: 3

	PB	S	Med	L	Ex
Damage:	60	60	55	50	30

Range Class: C
Payload: 1,550 rounds
Rate of Fire: 1200
Mass: 6,120 Kg
Cost: ¥40,520,000

25 mm Machine Gun System

	PB	S	Med	L	Ex
Damage:	80	80	70	65	40

Range Class: C
Payload: varies by installation, (100-1000 rounds)
Rate of Fire: 30
Mass: 850 Kg
Cost: ¥520,000

76mm gun

This is the largest artillery piece that has been transported to The Artifact at this time (although not the highest caliber artillery piece). The I-CA has imported two hundred of these systems so far and transported them to the Methane Wastes. However they have not been forthcoming with the purpose for transporting so many. However, they are not hiding them and will even show them off from time to time. There are also rumors that the I-CA has sold an unknown number of these weapons to unspecified buyers.

The damage statistics given are for standard rounds. However 76mm guns are often armed with high explosive rounds.

	PB	S	Med	L	Ex
Damage:	400	400	380	350	250

Range Class: D
Payload: varies by installation, (500-2000 rounds)
Rate of Fire: 20
Mass: 6,120 Kg
Cost: ¥520,000

Infrared Guided Air to Air Missile Launcher

Infrared guided air to air missiles are most often armed with an explosive fragmentation warhead. An infrared heat seeking guidance system controls them. There is no user intervention once the missile is deployed. Because of this if the missile is dodged the character does not roll to re-acquire the target (see: The Artifact, Game Rules, Missiles), this is done by the IR guidance system. The guidance systems of these missiles have some pattern recognition

abilities so they are not as easy to fool as versions built a century ago, but tend to be confused by low IR signature vehicles such as AG vessels that do not rely on thrusters for movement. They are also easily foiled by most ECM systems in use on The Artifact (If the target makes a successful ECM roll the missile will loose its lock on the target).

The launcher is most often-mounted on fighter jets but can operate on helicopters and AG vehicles.

Guidance System
Percent to Re-acquire: 75%

	PB	S	Med	L	Ex
Damage:	3K	1,500	1,500	750	150

Blast Range Class: A
Range Class: E
Payload: 1
Mass: 561.6 Kg
Black Market Cost: ¥1,500,000

Rocket Mass: 78.4 Kg
Missile Black Market Cost: ¥826,000

Radar Guided Air to Air and Surface to Air Missile Launcher

Radar guided air to air missiles are most often armed with a high explosive warhead. A compact radar guidance system controls them. There is no user intervention once the missile is deployed. Because of this if the missile is dodged the character does not roll to re-acquire the target (see: The Artifact, Game Rules, Missiles), this is done by the radar guidance system. These missiles are very versatile and have some anti-missile capabilities (-10 to intercept another missile). They are highly maneuverable and can strike in any direction in respects to the launcher. They are also easily foiled by most ECM systems in use on The Artifact (If the target makes a successful ECM roll the missile will loose its lock on the target).

The launcher is most often-mounted on fighter jets but can operate on helicopters and AG vehicles in an air to air capacity. In a surface to air capacity the launcher can be mounted on a wide verity of platforms including naval vessels and all the way down to light transports.

Guidance System
Percent to Re-acquire: 90%

	PB	S	Med	L	Ex
Damage:	10K	8K	8K	3K	900

Blast Range Class: B
Range Class: E
Payload: 1
Mass: 1,486 Kg
Black Market Cost: ¥10,740,000

Missile Mass: 225 Kg
Missile Black Market Cost: ¥3,308,000

Pistol Ammunition

Low Caliber Pistol

Low caliber pistols often have very low stopping power and are often disregarded as a sidearm. However low caliber pistols are still dangerous and easier to fire due to low recoil.
Mass: 1 Kg per 100 rounds
Cost: ¥150 per 100 rounds

Medium Caliber Pistol (FMJ)

Medium caliber pistol rounds are effective and easy to fire. They balance stopping power with average recoil.
Mass: 3.2 Kg per 100 rounds
Cost: ¥300 per 100 rounds

High Caliber Pistol (FMJ)

High caliber pistol rounds offer the best stopping power but also high recoil which can become tiring and possibly injure the user.
Mass: 6.4 Kg per 100 rounds
Cost: ¥540 per 100 rounds

Soft Point

The soft point round has an opening in the tip of the round's metal jacket. This causes the bullet to expand on striking its target. This causes greater damage to unarmored targets, but is less effective against armored targets.

Soft point rounds are illegal for military use but are effective hunting rounds.
Damage: +2 for objects with AR 0, -2 for objects with an AR 1 or greater.
Cost: Soft point rounds cost roughly the same as FMJ rounds.

Hollow Point

Like the soft point round, the hollow soft point has an opening in its metal jacket. However the hollow soft point has an indentation in the tip of the bullet that causes rapid expansion that is greater than the regular soft point. As a result, the hollow soft point is even more damaging to unarmored targets but is also even less effective against armored targets.

Hollow soft point rounds are illegal for military use.
Damage: +4 for objects with AR 0, -4 for objects with an AR 1 or greater.
Cost: Hollow soft point rounds cost roughly the same as FMJ rounds.

Reduced Penetration (frangible)

Used in aircraft to reduce the possibility of cabin depressurization. Also used for urban settings to reduce the possibility of a bullet passing through the target, walls or doors reducing the likelihood of unwanted casualties.
Damage: Double the AR of targets when using these rounds.
Cost: 3x FMJ rounds cost.

Rifle Ammunition

Rifle ammunition is given below in general categories for simplicity. It should be noted however that ammunition is often very specific to the model gun that it was manufactured for. This is especially true in the case of the higher caliber ammunitions. Some low caliber ammunition (especially in the low caliber hunting rifle range) the GM may show some flexibility in transferring ammunition between models, but with higher caliber weapons this should be expressly forbidden. An example of this is swapping between a high caliber machine gun and a high caliber sniper rifle. One type of ammunition is belt fed and a clip feeds the other but even this is a minor difference. There is also the caliber, the grains, the firing mechanism can be different, and often the ammunition for one model will perform poorly even if it should happen to function in a different model weapon. As a result, when ammunition is purchased, it should be listed next to the weapon it can be used with.

Low Caliber Hunting Rifle

Low caliber hunting rifle ammunition is lower powered than the low caliber rifle entry. These rounds are effective for hunting small animals and are inexpensive.
Mass: 1 Kg per 100 rounds
Cost: ¥100 per 100 rounds

Low Caliber Rifle (FMJ)

Low caliber rifle ammunition manufactured for assault weapons is distributed in battlepacks of three hundred rounds and come in thick waterproof bags with carry handles. Low caliber rifle rounds that are manufactured for machine guns are sometimes distributed in belts of 25 or 50 and are distributed in ammo cans. Otherwise they are distributed in the same manner as assault weapon ammunition.
Mass: 1 Kg per 100 rounds
Cost: ¥260 per 100 rounds

Medium Caliber Rifle (FMJ)

Medium caliber rifle rounds manufactured for assault weapons are most likely sold in battlepacks of 200 rounds and come in thick waterproof bags with carry handles. Five battlepacks (1,000 rounds) are stored in small wooden ammo crates.

Medium caliber rifle rounds that are manufactured for machine guns are sometimes distributed in belts of 25 or 50 and are distributed in ammo cans. Otherwise they are distributed in the same manner as assault weapon ammunition.
Mass: 6.2 Kg per 200 rounds
Cost: ¥700 per 200 rounds

High Caliber Rifle (FMJ)

There are relatively few weapons that use high caliber rifle ammunition. Because of this, ammunition is often manufactured specifically for individual weapons.

High caliber rounds are bulky and expensive and a hundred (100) rounds often fills an entire ammo can.
Mass: 15.9 Kg per 100 rounds
Cost: ¥3,600 per 100 rounds

Caseless Rounds

Caseless rounds require a weapon that is designed to fire them. When a weapon is purchased or assigned to a character, if it is to use caseless rounds it must be designated next to the weapon.

Caseless rounds are expensive and raise the possibility of the weapon jamming. However, they allow a higher rate of fire than brass cased round and weigh less.
Effect: Rate of fire x1.4. If the weapon is exposed to dust or water there is a +20% chance of jamming when fired.
Mass: x.6
Cost: x2 FMJ rounds cost.

Tracer Bullet

Tracer rounds are used to create a bright red visible streak along the path of the bullet. This makes grouping bursts easier, but also gives away the position of the person firing. The streak is generated by a flammable

insert such as magnesium and ignites when the bullet is fired. This effect is also useful for designating a target to a group and signaling. Tracer rounds are red tipped so they can be easily identified.
Effect: +10 to all fraction columns when firing a burst.
Cost: Tracer rounds cost roughly the same as FMJ rounds.

Steel Core

Steel core rounds are used to enhance the penetration of a round. Steel core rounds are not as effective as modern armor piercing rounds but are effective against light body armor and lightly armored vehicles.

Steel core rounds are often black or green tipped.
Damage: same as FMJ (standard rounds)
Armor piercing 25%
Cost: +40% of FMJ rounds cost.

Soft point

Military ammunition is covered in a full metal jacket (or FMJ) as is required by international law. The soft point round has an opening in the tip of the round's metal jacket. This causes the bullet to expand on striking its target. This causes greater damage to unarmored targets, but is less effective against armored targets.
Soft point rounds are illegal for military use but are effective hunting rounds.
Damage: +2 for objects with AR 0, -2 for objects with an AR 1 or greater.
Cost: Soft point rounds cost roughly the same as FMJ rounds.

Hollow Soft Point

Like the soft point round, the hollow soft point has an opening in its metal jacket. However the hollow soft point has an indentation in the tip of the bullet that causes rapid expansion that is greater than the regular soft point. As a result, the hollow soft point is even more damaging to unarmored targets but is also even less effective against armored targets.

Hollow soft point rounds are illegal for military use.
Damage: +4 for objects with AR 0, -4 for objects
with an AR 1 or greater.
Cost: Hollow soft point rounds cost roughly the same as FMJ rounds.

Reduced Penetration (frangible)

Used in aircraft to reduce the possibility of cabin depressurization. Also used for urban settings to reduce the possibility of a bullet passing through the target, walls or doors reducing the likelihood of unwanted casualties.
Damage: Double the AR of targets when using these rounds.
Cost: 3x FMJ rounds cost.

Reduced Velocity

The majority of rifle rounds travel at supersonic speeds. This means the bullet itself creates a loud crack in addition to the sound of the gun being fired. This can be detrimental to snipers or anyone who is trying not to be located. The reduced velocity round travels just under the speed of sound and therefore produces no supersonic crack.
Reduced velocity rounds are blue tipped.
Damage: -2
Cost: 2x FMJ rounds cost.

Armor Piercing Discarding Sabot (APDS)

Saboted rounds have a soft plastic case around the bullet that falls away after leaving the barrel. The remaining sub-caliber penetrator is often made of a material such as tungsten.

APDS rounds are only available for medium to heavy caliber rounds.
Damage: -1
Armor piercing 60%
Cost: x3 FMJ rounds cost.

Armor Piercing

Modern armor piercing rounds are often made of a dense and hard substance such as tungsten and may have a coating such as Teflon at the tip.

Armor piercing rounds are usually green tipped.
Armor piercing 50%
Cost: x3 FMJ rounds cost.

Incendiary

Incendiary rounds usually have a insert of a combustible material such as magnesium or zirconium. As the bullet mushrooms the intense heat ignites the insert and starts any nearby combustible material on fire. Incendiary rounds are often used by snipers to ignite fuel tanks in unarmored or lightly armored vehicles and fuel dumps. Incendiary rounds will also start wood on fire.

Soft targets such as cloth or flesh do not offer enough resistance to start the insert on fire.

Incendiary rounds are tipped blue.
Effect: +30 to get a critical hit on a fuel tank called shot.
Cost: x3 FMJ rounds cost.

Armor Piercing Incendiary

Armor Piercing Incendiary rounds has an insert of magnesium or zirconium in front of an armor-piercing insert. As the round impacts the target, the friction of the jacket crumpling ignites the flammable insert. The armor-piercing insert is then propelled forward through the bullet and into the target, trailing the flammable insert material behind it.

Soft targets such as cloth or flesh do not offer enough resistance to start the flammable insert burning.

Armor piercing incendiary rounds are tipped with aluminum or white.
Effect: +30 to get a critical hit on a fuel tank called shot.
Armor piercing 50%
Cost: x3 FMJ rounds cost.

D.U.M. rounds (Depleted Uranium Munitions)

Depleted uranium is a rare naturally occurring metal that is mined on earth. It has several unique properties that make it highly effective. The first is that uranium is denser than lead and therefore carries more energy. Uranium rounds are also "self sharpening". The tip burns away as it penetrates leaving a continuously sharp point instead of mushrooming.
Damage x3
Armor Piercing 50%
Cost: x10 FMJ rounds cost.

Depleted Uranium Sub-caliber Penetrator

Depleted uranium Sub-caliber Penetrators are D.U.M. rounds that are saboted to create a thinner and more stable projectile. Only medium and heavy caliber weapons can use this kind of ammo. The saboted rounds carry less punch than regular rounds, but are better at penetrating heavy armor.
Damage x2
Armor Piercing 75%
Cost: x15 FMJ rounds cost.

Explosive rounds (HESH)

Explosive-tipped bullets are essentially hollowpoint bullets with an explosive element designed to dramatically and rapidly enhance bullet expansion upon impact.

HESH rounds are illegal for military use. Damage x2 to unarmored targets, -4 to targets with an AR of 3 or more.
Cost: x5 FMJ rounds cost.

Artillery Ammunition

Standard Ammunition

Standard artillery ammunition prices are not usually listed because it is assumed that military characters will be supplied with ammunition that they need. Standard ammunition prices are listed by Range Class and use the Point Blank Damage of the weapon to determine their cost.

Range Class A
Cost: ¥0.1 x PB Damage

Range Class B
Cost: ¥0.25 x PB Damage

Range Class C
Cost: ¥1 x PB Damage

Range Class D
Cost: ¥3 x PB Damage

Range Class E
Cost: ¥10 x PB Damage

High Explosive

High explosive rounds are used against lightly armored ground targets such as E-Suits.
Damage: x1.25
Cost: x3 normal

Fused Delay Explosive

Fused Delay rounds are used against semi-hardened targets. Because the round pierces the armor and then detonates, the round has a greater chance of causing a critical hit.
Damage: normal
Armor piercing 20%
Critical: +10%
Cost: x2 normal

Armor Piercing Discarding Sabot

APDS rounds are used against heavily armored targets.
Damage: Reduced by 10%

Armor piercing 50%
Cost: x5 normal

Tracer

Tracer rounds are used to create a bright red visible streak along the path of the shell. This makes grouping shots easier, but also gives away the position of the person firing. The streak is generated by a flammable insert such as magnesium and ignites when the shell is fired. This effect is also useful for designating a target to a group and signaling. Tracer rounds are red tipped so they can be easily identified.
Damage: Normal
Cost: x2 normal

Air Burst Munitions

ABM rounds are used against aircraft, light vehicles, dismounted troops and bunkers.

The damage that ABM rounds do is based on the point blank damage for that round. Each range slot is multiplied by a decimal number shown below. The ABM does less direct damage than a standard round but has a blast radius and effects all targets in that radius.

	PB	S	Med	L	Ex
Damage:	0.9	0.7	0. 3	0.1	0.01

Range Class: B
Cost: x2 normal.

D.U.M. rounds (Depleted Uranium Munitions)

Depleted uranium is a rare naturally occurring metal that is mined on earth. It has several unique properties that make it highly effective. The first is that uranium is denser than lead and therefore carries more energy. Uranium rounds are also "self sharpening". The tip burns away as it penetrates leaving a continuously sharp point instead of mushrooming.
Damage x2
Armor Piercing 50%
Cost: x10 normal.

Depleted Uranium Sub-caliber Penetrator

Depleted uranium Sub-caliber Penetrators are D.U.M. rounds that are saboted to create a thinner and more stable projectile. The saboted rounds carry less punch than regular rounds, but are better at penetrating heavy armor.
Damage x1.5
Armor Piercing 75%
Cost: x15 normal.

12 Gauge Ammunition

Anti-Riot rounds

Anti-Riot rounds fire either rubber bullets or a small beanbag that stuns the target. Because of the force of the shotgun blast, these rounds can do significant damage at close range.

	PB	S	Med	L	Ex
Damage	8	5	Stun	Stun	Stun

Range Class: A
Cost: ¥120 each

Anti-Sniper round

Anti-Sniper rounds fire small flechettes that can pass through light cover each flechette does not do a lot of damage, but the round increases the likelihood of hitting a concealed target.

	PB	S	Med	L	Ex
Damage	1d10	1d10	1d6	1d6	1d6

Range Class: A
Plus to Strike: +20
Cost: ¥94 each

Birdshot

The damage listed under a shotgun is for solid slug rounds. Solid rounds travel further and inflict more damage at long range. Birdshot is used to increase the chances of hitting small targets such as birds or rodents. However Birdshot also has very high stopping power at close range.

	PB	S	Med	L	Ex
Damage	22	15	4	2	1

Range Class: A
Plus to Strike: +20
Cost: ¥60 each

Bird Bomb

Used in agriculture to scare off birds and other animals, bird bombs are small explosive devices that create a loud noise.

	PB	S	Med	L	Ex
Damage	3	1	-	-	-

Range Class: B
Cost: ¥60 each

Explosive Round

	PB	S	Med	L	Ex
Damage	30	25	20	18	15

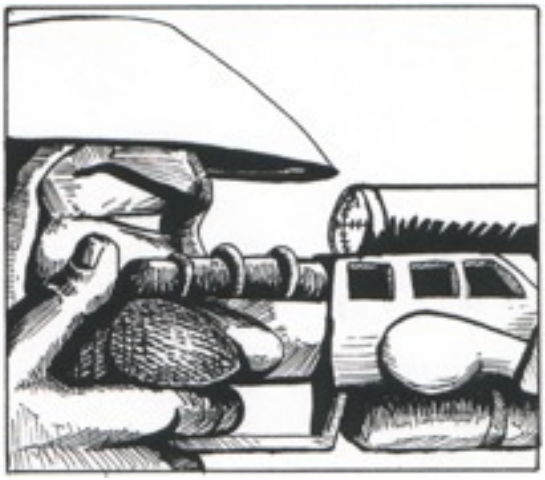
Range Class: B
Cost: ¥240 each

Flare Round Range Class: B

	PB	S	Med	L	Ex
Damage	3	1	-	-	-

Cost: ¥160 each

Gun Accessories



This optional equipment enhances the performance and usability of a weapon.

Telescopic Sight

The telescopic sight gives a plus to strike at medium and greater ranges. However fast moving targets are harder to target through the sight.
Plus to Strike: +30 at medium or longer rages, but an additional -20 to hit fast moving targets.
Mass: 250 g
Cost: ¥ 4000

Laser Sight

The laser sight projects a tiny red dot of laser light on the target. However the dot is too difficult to see past forty meters without a telescopic sight.
Plus to Strike: +10 for targets under forty meters away.
Mass: 150 g
Cost: ¥ 2000

Infra-Red Sight

Infra Red sights allow for use when visibility is poor. These sights also commonly also function as telescopic sights. Plus to Strike: No negative modifiers for darkness, fog, smoke, or foliage.
Mass: 450 g
Cost: ¥ 5500

Laser Sight/Rangefinder

This accessory is identical to the Laser Sight, but also determines range to a target. This is especially useful when linked to a Guncomp.
Mass: 55 g
Cost: ¥ 2100

Bipod

This accessory is used with weapons with masses over five kilograms. A bipod also aid in reducing recoil. This accessory allows the use of heavy weapons without con rolls and increases accuracy in bursts.
The Bipod gives a +10 to the character's 1/2, 1/4, and 1/8, fraction columns when it is in use. While the Bipod is in use, the character's wielding mass is ignored.
Mass: 3 kg
Cost: ¥ 6,000

Recoil Reducer

Recoil reducers are used to reduce some of the kick from slug throwing weapons. The reducer is often a rubber pad attached to the but of a rifle stock but occasionally is a mechanical device inside the stock of the rifle.

The recoil reducer gives a +2 to the character's 1/2, 1/4, and 1/8, fraction columns.
Mass: 100 g
Cost: ¥ 400

Bayonet

Bayonets are knifes fixed to the barrel of a gun, usually used with rifles but can be used with shotguns if specially modified.
Damage: 10
Mass: 300 g
Cost: ¥ 800

Detachable/Folding Stock

Detachable stocks are used on shotguns and assault rifles. Removing the stock makes the weapon easier to carry (+10 to Ref rolls) but eliminates bonuses for aiming and the sniper skill.
Mass: 10 g more than a normal stock
Cost: ¥ 3000

Flashlight Holder

This small clamping mechanism attaches to the barrel of a rifle or a shotgun. Will accommodate most round flashlights. Frees the hands to aim with while illuminating the target.
Mass: 50 g

Cost: ¥ 600

Shotgun Belt
Holds 25 shotgun shells or 50 rifle rounds. Type (shotgun or rifle) must be specified.
Mass: 250 g
Cost: ¥ 250

Bandoleer
Holds 45 shotgun shells or 90 rifle rounds over the shoulder. Type (shotgun or rifle) must be specified.
Mass: 350 g
Cost: ¥ 600

Dummy Cord
A dummy cord is attached to the user's belt or other fixed position and to the butt of a pistol. This is especially important when the user is rushed and needs his hands or if knocked unconscious. The dummy cord will keep the pistol at their side.
Mass: 20 g
Cost: ¥ 200

Fire Control System (FCS)
These devices are available for most modern Assault Weapons and their optional combat systems. The FCS is primarily a telescopic sight, infrared sight and laser rangefinder when attached to the assault weapon itself. However it becomes a primary component of optional combat systems such as smart grenade launchers and rocket propelled systems such as the AVW. The FCS is designed to transmit the range to target to an optional combat system. This allows grenades to airburst over a specified target or the munitions can detonate over foxholes or past corners to strike targets that are under cover.
Most FCS systems include a video camera for recording events on the battlefield.

Plus to Strike for Assault Weapon: +40 at medium or longer rages, but an additional -20 to hit fast moving targets. No negative modifiers for darkness, fog, smoke, or foliage. Plus to Strike for Optional Combat Systems: +30 No negative modifiers for darkness, fog, smoke, or foliage.

Battery Life: 20 Hours
Mass: 570 g
Cost: ¥ 30,000

Advanced Fire Control System (AFCS)
The AFCS saw it's first service in 2023. The AFCS is a pattern-recognizing computer that can identify human and vehicular targets and track them to a limited extent. The AFCS also performs all the functions of the FCS systems. When used with the assault weapon it was designed for, the AFCS attempts to recognize all the human and vehicular targets in it's camera's field of view. The operator then can enter one of four modes.
Combat mode designates all of the human and vehicular targets that the system identifies as valid targets. As the trigger is squeezed, the system will only authorize fire when it believes the round will hit a target. This means that if a target is not recognized by the system it will not fire. 75% likely to recognize a programmed target.

Plus to Strike for Assault Weapon: +40 No negative modifiers for darkness, fog, smoke, or foliage. Plus ten (+10) to all fraction columns (1/2, 1/4 and 1/8) when rolling on the Multiple Actions table.

Plus to Strike for Optional Combat Systems: +30 No negative modifiers for darkness, fog, smoke, or foliage.

Sniper mode Attempts to recognize targets in the same way as Combat mode, but will only fire on sensitive hit locations. These must be pre-programmed in the AFCS software. Sensitive hit locations generally are, the head and body of humans (although head only can be specified) and fuel tanks and sensors of vehicles. 50% likely to recognize a programmed target.

Plus to Strike for Assault Weapon: +40 No negative modifiers for darkness, fog, smoke, or foliage. Plus ten (+10) to all fraction columns (1/2, 1/4 and 1/8) when rolling on the Multiple Actions table. The weapon only fires sensitive hit locations as specified above.

Plus to Strike for Optional Combat Systems: +30 No negative modifiers for darkness, fog, smoke, or foliage.

Selective mode allows the operator to designate what targets that are in the AFCS viewfinder which targets should not be fired upon. This mode is effective for hostage situations and for a verity of other field operations. It takes one (1) action to designate

that a target should not be fired upon and the AFCS will loose it's ability to track an individual target if they move out of the unit's field of view (approx. a 30 degree cone in front of the AFCS). 75% likely to recognize a programmed target.

Plus to Strike for Assault Weapon: +40 No negative modifiers for darkness, fog, smoke, or foliage. Plus ten (+10) to all fraction columns (1/2, 1/4 and 1/8) when rolling on the Multiple Actions table. It is 90% likely that the AFCS will not fire on a target if it has been specified.

Plus to Strike for Optional Combat Systems: +30 No negative modifiers for darkness, fog, smoke, or foliage. The Optional Combat System will not fire if targets have been specified.

Manual mode returns the weapon to normal operation and the ACFS acts as the FCS system.

Plus to Strike for Optional Combat Systems: +30 No negative modifiers for darkness, fog, smoke, or foliage.

Battery Life: 12 Hours
Mass: 695 g
Cost: ¥ 70,000

Weapon Mounted Personal ECM System

The Weapon Mounted ECM system is identical in function to the Personal ECM System (see: Defensive Systems). The unit attaches to the underside of a rifle or carbine barrel. The ECM has a 60% chance of identifying and neutralizing optics. The ECM can simultaneously effect all optics systems in its scanning cone, but a percentile roll must be made for each target.
Battery Life: 6 Hours
Mass: 1.1 Kg
Cost: ¥ 140,000

Pistol Silencer

Fixed to projectile pistols greatly reduces flash and noise. A silencer is not exchangeable between different weapons.
Mass: 160 g
Cost: ¥ 10,000

Rifle Silencer

Fixed to projectile rifles greatly reduces flash and noise. Some rifle silencers only disperse the sound of the rifle firing so that it is more difficult to locate the weapon that is firing. A silencer is not exchangeable between different weapons.

Most rifle rounds fire their projectile at supersonic speeds. This produces a loud supersonic crack. Some silencers can suppress this noise by slowing the bullet, but they behave as reduced velocity rounds. (see: Rifle Ammunition, Reduced Velocity)
Mass: 500 g
Cost: ¥ 30,000

Flash Suppressor

This tube screws onto the end of a rifle barrel and prevents flash from giving away your position in dark situations.
Mass: 100 g
Cost: ¥ 1,000

Muzzlebrake

This tube screws onto the end of a rifle barrel. Holes on top of the brake keep the muzzle from rising enhancing accuracy.

The muzzlebrake gives a +10 to the character's 1/2, 1/4, and 1/8, fraction columns when it attached to the rifle.
Mass: 100 g
Cost: ¥ 1,000

Holster

A handy item often overlooked, a holster is much safer than keeping a sidearm in a pack or tucked in one's pants.
Mass: 200 g
Cost: ¥ 100-200

Underarm Holster

Conceals pistols under 1 kg in mass
+10 Conceal Object
Mass: 100 g
Cost: ¥ 150-200

Horizontal Concealment Holster

Horizontal holsters are designed to fit underneath a coat (including suit coats) or cloak. A horizontal holster has a quicker draw time than conventional holsters and can be drawn more discretely.
+10 to Ref when drawing.
+10 Conceal Object
Mass: 200 g
Cost: ¥ 240

Sling

A sling can be used to carry a rifle or shotgun over the shoulder for quick access.
Wielding mass X 2

Mass: 300 g
Cost: ¥ 100-200

Guncomp

Gun comps are tiny computer chips installed into the handle of a gun. Tiny sensors are placed around the gun to monitor number of rounds fired, number remaining in the clip, and temperature levels. The comp also has a voice recognition circuit (90% reliable) to activate and deactivate the safety. A one by three cm. three digit display is fixed to the outside of the gun, showing the number of rounds left. If the gun jams, overheats or malfunctions in any way, the display will flash on and off. The LCD screen is available in opaque and lighted versions. (Lights are easy to see in the dark by you and your enemy.) A secondary screen can link up to rangefinders and telescopic scopes, giving the gun a smart targeting feature (+10 to hit).
Mass: 15 g
Cost: ¥ 60,000

Gun Case

Used for transporting weapons so they do not get damaged or rust. Also holds extra ammunition and gun cleaning accessories
AR 2
HP 10
Mass: 2 kg empty
Cost: ¥ 1,000

Pistol Case

Used to transport Pistols so they are not damaged or rust. Also holds extra ammunition and gun cleaning accessories
AR 2
HP 10
Mass: 1 kg empty
Cost: ¥ 1,000

Gun Sock

A lightweight protective cover used for storing and protecting guns from moisture, minor abrasion and grit.
Mass: 15 g
Cost: ¥ 200

Magazine Pouch

Keep extra Magazines on the belt within easy reach to facilitate reloading. Holds 3 magazines.
Mass: 30 g
Cost: ¥ 180

Jungle Clipper

Attaches two magazines together so a fresh magazine is readily available once the first is spent.
Mass: 4 g
Cost: ¥ 100

Demolition and Construction Munitions

Contact Detonator

The contact detonator uses an electrical circuit as a detonator. The detonator can be set to trip when the circuit is closed or open. This is often employed to boobytrap something such as a door or window, either sensing that it has opened or closed. Any electrical devices can be used in conjunction with this system to either create or break the electrical circuit (requires an electronics skill roll in addition to the standard Explosives skill roll).

The detonator has a safety pin that must be removed for it to operate.
Cost: ¥500

Infra-red Detonator

The infra-red detonator consists of two devices, the detonator and the transmitter. The transmitter is reusable. The detonator is also the receiver and uses any standard blasting cap to detonate an explosive payload. The transmitter and the detonator have short selectable keys that prevent accidental detonation by infra-red radiation. These keys must match in order for the detonator to operate.

The infra-red detonator requires an unobstructed line of site to operate.

The detonator has a safety pin that must be removed for it to operate.
Range: 1km unobstructed
Cost: ¥800

Laser Detonator

The laser detonator consists of two devices, the detonator and the Laser. The laser can be any source of low level laser light. The detonator is also the receiver and uses any standard blasting cap to detonate an explosive payload. Any laser light striking the detonator will trigger the device.

The Laser detonator requires an unobstructed line of site to operate.

The detonator has a safety pin that must be removed for it to operate.
Range: 2km unobstructed
Cost: ¥1,200

Motion Detection Detonator

Motion detector detonators use infrared beams to detect objects moving into their field of view. Crossing a single beam can trip the detector. The detonator uses any standard blasting cap to detonate an explosive payload.

The detonator has a safety pin that must be removed for it to operate.

Every turn that an object is moving through the detector's one hundred and eighty degree (180) field of view there is a ninety percent (90%) chance of detection. Range Class PDF modifiers effect this chance.
Range Class: A
Mass: 100 g
Cost: ¥200

Pull Cord/Trip Line Detonator

The pull cord/trip line detonator has a tension spring that is adjustable to the amount of force required to activate the detonator. This can range from a slight touch, to a hard yank on the attached cord. An eyelet is used to connect any cord under five millimeters in diameter to the device. When pulled with the correct tension or greater, the detonator triggers any standard blasting cap.

The detonator has a safety pin that must be removed for it to operate.
Cost: ¥550

Radio Detonator

The radio detonator consists of two devices, the detonator and the transmitter. The transmitter is reusable. The detonator is also the radio receiver and uses any standard blasting cap to detonate an explosive payload. The radio and the detonator have short selectable keys that prevent accidental detonation by radio signal. These keys must match in order for the detonator to operate.

The radio signal can be jammed or may be cut off by physical obstruction.

The detonator has a safety pin that must be removed for it to operate.
Range: 5km unobstructed
Cost: ¥ 1,000

Temperature Detonator

The temperature detonator normally consists of two bimetallic strips that bend as it is heated or cooled. One detects a temperature drop and the other a rise in temperature. The detonator can be set to detect either or detonate when it gets to a specific temperature.

The detonator has a safety pin that must be removed for it to operate.
Cost: ¥600

Tilt/Vibration Detonator

The tilt/vibration detonator uses a mercury switch to trigger a standard blasting cap. The mercury switch will create a circuit if the detonator is rocked, or tipped more than 3 degrees from plumb. The detonator itself has a bubble level built in that can be used for leveling the switch. for These detonators are dangerous because they can trip the sensor as soon as they are armed. If the detonator is not level, it will go off.
The detonator has a safety pin that must be removed for it to operate.
Cost: ¥600

Time-delay Detonator

The time-delay detonator uses a timer to trigger any standard blasting cap. The time -delay is often selectable and can range from seconds to hours.

The detonator has a safety pin that must be removed for it to operate.
Cost: ¥800

Field Prepared Detonators

The detonators listed above are pre-made systems. However any character with Electronics and Explosives skills can prepare their own detonators if they have access to the correct equipment. Field prepared detonators take one hour to build. Jury rigging the detonator can reduce that time but it has a much greater chance of failure. If a half-hour is taken to build the detonator, it has a twenty five-percent (25%) chance of failure. If fifteen minutes is taken to build the detonator, it has a fifty-percent (50%) chance of failure. If less time than that is taken, the detonator has a seventy-five percent (75%) chance of failure.

The builder must have access to equipment that they can use to build the detonator such as radios for a radio detonator etc.
Cost: ¥various

Detcord

Detcord is a ropelike explosive that is used to start multiple explosions in a timed sequence. The cord is an explosive itself that when wrapped around a lightly or unarmored object can "cut" the object.

When used to trigger multiple explosions the cord is strung between the explosive payloads. There is a millisecond

time delay for anything up to a hundred meters of cord. As such delays between explosions are not perceivable. The time delay is only useful for enhancing the explosive force of the multiple charges by creating a path for the force to travel (requires an Explosives skill roll and a Structural Recognition skill roll). When successful, the damage caused by this time-sequenced explosion is increased by ten percent (10%).
Damage: 5 per meter of cord.
Blast Range Class: None
Mass: 80 g per meter of cord
Cost: ¥2,000 per meter of cord

Penetration Augmented Munition

These munitions are designed to be effective against reinforced structures such as bridges or bunkers, and have also been show effective in removing large volumes of concrete or CCC. The Penetration Augmented Munition uses a three-phase process that reduces the volume of explosives necessary to defeat a target. The first phase is a shaped charge that blasts a hole into the target. The second phase propels a charge into the hole created. The third phase consists of the charge detonating inside of the target.

A silenced explosive stud driver secures the munition to the target. The Munition is then triggered by a standard blasting cap.

The Penetration Augmented Munition, if used against a vehicle will cause 1d10 critical hits.
Damage: 5000
Blast Range Class: None
Mass: 13 Kg
Cost: ¥800,000

Light Attack Munition

These are self-contained munitions designed to be carried and used by footsoldiers to defeat lightly armored vehicles and structures. The munition consists of a shaped charge and a multi-mode fuse system that supports blasting cap detonation, user selectable time delay firing device (up to 2 hours), or a fuze by wire mode that allows remote detonation by running communication wire.

The light attack munition uses a shaped charge to defeat armored targets.
Damage: 600
Blast Range Class: None
Mass: 500 g
Cost: ¥20,000

Teleport Bomb

The teleport bomb is a special tactical device developed by the Chinese government. It uses teleporter technology to deliver an explosive payload to a target. To teleport the payload to the target a receiver must be in place. The receiver needs a method of communicating with the transmitter. In most instances standard radio transmission will suffice, however sometimes wormhole communicators are used but this greatly increases the power requirements of the receiver.

The receiver does not have an internal power supply. In order to function, there must be a power source capable of supplying roughly sixty thousand (60,000) watts of power.

	PB	S	Med	L	Ex
Damage:	10k	5k	5k	2k	1k

Blast Range Class: C
Mass: 120 KG
Cost: ¥200,000,000

Non-Lethal Weapons

These are weapons that are explicitly designed and employed so as to incapacitate personnel or their equipment, while minimizing fatalities, permanent injury to personnel, and undesired damage to property and the environment. Unlike conventional lethal weapons that destroy their targets, non-lethal weapons employ means other than gross physical destruction to prevent the target from functioning. Non-lethal weapons are intended to have one, or both, of the following characteristics: 1. They have relatively reversible effects on personnel or materiel , 2. They affect objects differently within their area of influence

Adhesive Foam

Adhesive foam was conceived as a method for restricting the move ment of a target with minimal harm. A backpack of pressurized liquid feeds a nozzle that sprays a solid stream of ultra-dense adhesive foam. The foam is so sticky that it instantly adheres to the target. The foam is also extremely cohesive resisting nearly any attempt to remove it. When the foam is targeted at the feet and legs, it also sticks to the floor and completely immobilizes the target. If the foam strikes any other part of the body it is a major hindrance to the target's movement. However the technique had one major flaw. If the foam were to strike the face, the victim would not be

able to remove it and would suffocate. A breakthrough in material technology allowed this hurdle to be overcome. Chemical binders of hydrophobic molecules repel the water in the foam and bridge the bubbles of air found in the foam and form tubes that allows air to be transmitted through the foam and prevent suffocation.

This technology first began appearing in commercial applications such as "super glue" and quick setting foam insulation. It is extremely persistent and is virtually impossible to remove without a liquid solvent. The solvent can be applied as a spray or poured on. The foam then appears to dissipate, releasing its hold. Sticky foam came to public attention on February 28, 1995 when U.S. Marines used it in Mogadishu, Somalia, to prevent armed intruders from impeding efforts to extricate United Nation forces from that county.

Effect: If hit in the feet or legs and the floor is a solid surface, victims are effectively glued to the floor and are immobilized. If hit anywhere else in the body, the victim cannot use that appendage or anything that was held or stored there. Anything touching that body part will also become stuck including other body parts.

Save vs. immobilization: Strength roll. Must roll under the victim's 1/2 fraction column, and cannot touch the floor again directly or will have to brake free again.

Range Class: A
Payload: 2
Rate of Fire: 1
Mass: 16 KG
Cost: ¥62,300

Anti-riot Microwave Emitter

Developed in the late 1990's by the United States government. The original device was vehicle mounted and designed to be used at a distance. The low energy microwave stream causes the target to feel as if their skin were burning. The microwave emitter has seen vast technical improvement over the years, including miniaturizing which has made the device a sidearm sized device. This however has raised several moral issues in regards to its use. Since the device leaves very little physical trace of it's use when used in the proper manner, it has been employed as a torture device by a range of organizations.

Effects: Victims feel as if their skin is burning. This often causes the victim to panic and flee. If the victim panics they must do whatever they can to run away from the beam.

Save vs. Panic: Psyche roll

PB	S	Med	L	Ex
Damage: 2	1	burn	burn	burn

Range Class: B
Payload: 5
Rate of Fire: 1
Mass: 31 KG
Cost: ¥76,000

Stun Gun

The stun gun is a hand held device that delivers a high voltage electric charge to the target. There are two types of stun guns, one that fires two needle like projectiles trailed by thin wires and the hand to hand models. There is a large variety of these devices available on the open market. They are for the most part considered safe unless used repeatedly on a target. Stun guns are effective on a large majority of targets, only those that are extremely large are routinely slightly more resistant to its effects. However, some narcotics such as PCP, Cocaine, and Pump in higher doses have been known to make a person highly resistant to the stun gun's effects.

Effects: Victims are rendered unconscious. Save vs. stun: Constitution roll or Psyche roll. Victim must roll under the 1/4 fraction column. Victims over 125 kg have a plus ten to their 1/4 fraction column for the purposes of this roll.

Projectile
Damage: stun
Range: 3 meters
Payload: 1/10
Rate of Fire: 1
Mass: 75 g
Cost: ¥2,000

HTH
Damage: stun
Range Class: touch
Payload: 10
Rate of Fire: 1
Mass: 75 g
Cost: ¥1,800

Tranquilizer Rifle

This specially designed breach loading rifle fires a needle tipped vial of tranquilizer at a target. Dosage can be adjusted when filling the vials with the tranquilizer to suit the requirements of the target. In this manner even extremely large or resistant targets may be effectively brought down. (See: Sedatives)

PB	S	Med	L	Ex
Damage: tranq	tranq	tranq	tranq	tranq

Range Class: B
Payload: 1
Rate of Fire: 1
Mass: 2.3 Kg
Cost: ¥9,000

Tranquilizer Pistol

These are CO2 powered pistols that fire a short range hypodermic needle. The hypodermic needle is normally used to deliver a dose of sedatives (See: Sedatives) but can also deliver a variety of other drugs.

PB	S	Med	L	Ex
Damage: tranq	tranq	tranq	tranq	tranq

Range Class: A
Payload: 1
Rate of Fire: 1
Mass: 7 g
Cost: ¥16,000

Sedatives

Sedatives are chemical agents that induce sleep. While there are a variety of drugs that may be used to that end, this section will treat them more or less generically. The most effective means for delivering sedatives is by injection because the dosage entering the bloodstream is consistent. However some may be ingested or inhaled with various degrees of effectiveness, but rates of respiratory absorption and digestive system absorption is different, along with the quantity of exposure. As a result, the preferred delivery method is by hypodermic injection. The addition of a chemical called DMSO (dimethyl sulfoxide) increases the absorption rate of several kinds of sedatives about ten times what is normal. This allows for a sedative delivery just by touching the skin. However sedatives do not often come mixed with DMSO. In order to create a skin contact sedative, the player must make a successful chemistry roll to properly prepare the sedative.

Effect of Injection: The amount of drug delivered is tailored to the intended target. As such, the person preparing the injection designates the period of sedation. However the longest period of sedation is thirty minutes for a healthy human, any more than this and a number of serious and potentially deadly health effects occur. These can include respiratory failure and cardiovascular failure.

For targets larger than one hundred Kilograms and animals with unknown biology, the longest "safe" period of sedation is considered to be fifteen minutes.

Effect of Inhalation, Ingestion or Skin Absorption: Because the quantity of drug delivered to the blood stream is unknown, the effective duration of sedation is random. In addition the quantity of drug required for a minimal effect is much greater (5 times the normal dose). In addition the sedatives used in injection are not compatible with the sedatives used in ingestion and inhalation. Mixing the two will often cause adverse health effects, such as respiratory failure and cardiovascular failure. The average period of sedation through ingestion or inhalation is between thirty seconds and five minutes (2D10 turns). The victim may attempt to make a drug resistance roll and cut that time in half.

Save vs. effect: Constitution roll under 1/8 fraction column.

Average 5 Min Dosage: 20 cc
Cost: ¥600 per dose

Emetic (vomiting) **Agents**

Emetic agents cause violent spasms in the digestive tract that cause projectile vomiting and evacuation of the bowls. These agents are dangerous and can cause serious damage and even death. Emetic agents are most often ingested but there are some agents that can be inhaled.

Effect: Victims are incapacitated by violent vomiting and bowel evacuation. If the victim fails their constitution roll and does not receive medical assistance in twelve hours, they will die from the effects of this agent.

Save vs. death: Constitution roll + Drug Resistance skill or a subsequent roll vs. General Medicine.

Save vs. effect: Constitution roll under 1/8 fraction column.

Average Dosage: 20 cc
Cost: ¥240 per dose

Concussion Grenade

Concussion Grenades use a mild explosive and incendiary charge to create a concussive blast and blinding flash that stun a target. These grenades are also called Flash-Bangs.

Effect: Victims are often winded and if they were looking in the direction of the grenade when it went off will be temporally blinded (1d6 turns).

Save vs. stun: Constitution roll
Save vs. blind: Reflex roll

	PB	S	Med	L	Ex
Damage:	3	1	stun	stun	stun

Blast Range Class: A
Mass: 175 g
Cost: ¥8,000

Sedative Grenade

The sedative grenade is a specially prepared concussion grenade that delivers an airborne and skin contact sedative.

Effect: Victims are often winded and if they were looking in the direction of the grenade when it went off will be temporally blinded (1d6 turns). The sedatives take several seconds to over a minute to take effect (1d6 turns before they are effective). The effect of sedation is between thirty seconds and five minutes (2D10 turns). The victim may attempt to make a drug resistance roll and cut that time in half. Full body armor will half the time that the character is sedated. Vac-suits will block any of the effects of sedation but not the blinding or stun effects of the flash bang. If a vac-suit is damaged, the effect of the sedation is only halved.

Save vs. stun: Constitution roll
Save vs. blind: Reflex roll
Save vs. sedation: Psyche roll + Drug Resistance skill

	PB	S	Med	L	Ex
Damage:	3	1	stun	stun	stun

Blast Range Class: A
Mass: 175 g
Cost: ¥8,000

MK1 Illuminating-Grenade

The MK1 Illuminating Grenade, which produces 55,000 candlepower for 25 seconds, effectively blinds targets caught in the center of its illumination zone for short periods of time. The MK1 can also be used for non-combat purposes for illuminating large areas. The illumination effectively lasts for two turns.

Effect: Victims are blinded temporarily (1d6 turns) if they are in dark conditions and are near the grenade when it went off. Save vs. blind: Victim must roll under their Reflex 1/4 fraction column.

	PB	S	Med	L	Ex
Damage:	Blind	Blind	Blind	-	-

Blast Range Class: B
Mass: 231 g
Cost: ¥6,000

Isotropic Radiator-Grenade

These special munitions illuminate or bloom with laser-bright intensity causing the same retinal or optical damage as LEL (low energy laser) weapons. Isotropic radiation is generated by an explosive burst that superheats gaseous plasma surrounding it, causing a laser-bright flash. However the bloom is too brief to serve as effective illumination.

Effect: Victims are blinded temporarily (2d10 turns) if they are near the grenade when it went off regardless of local illumination. Failing the saving roll causes permanent partial loss of vision unless corrective surgery can be performed. Optics such as low-light and infrared can be damaged by the bloom (25% for each device).

Save vs. blind: Victim must roll under their Reflex to prevent permanent vision loss and under their 1/4 to prevent temporary blindness.

	PB	S	Med	L	Ex
Damage:	Blind	Blind	Blind	Blind	-

Blast Range Class: B
Mass: 350 g
Cost: ¥30,000

Clogger Grenade

The Clogger Grenade uses a low yield explosive device to distribute sticky-soft polymer agents to clog up body armor joints. The clogging agent hangs in the air like smoke

and will persist for six turns unless air movement blows it away. Clogging agents are mixed with dyes and result in "tinted clouds" whose presence let friendly forces know not to enter them. These clouds can be intermixed with "decoy mines" consisting solely of colored smoke.

Effect: Armored victims loose mobility when caught in the cloud. The PDF modifier below applies to Agi and Ref until the effected body armor is removed or cleaned with a solvent. The clogging effect is inconsequential to vehicles.

	PB	S	Med	L	Ex
Damage:	-30	-20	-10	-5	-2

Blast Range Class: A
Mass: 350 g
Cost: ¥30,000

Aqueous Barrier Foam

Barrier Foam is a dense soapy material that is blown into place. It is fire retardant non-toxic and biodegradable. The foam can be piled up over one hundred and thirty centimeters (130 cm). The foam is not used to block movement, but impedes movement and can be used to conceal booby traps. Simple traps can be made into major obstacles by covering them in barrier foam. Concertina wire becomes nearly impassable and very difficult to clear. Caltrops are nearly undetectable when covered with the barrier foam. By applying the foam over obstacles, it impedes the ability to defeat them (-20 to any dexterity rolls when working in the foam). Barrier foam slows movement by as much as 25% for humans on foot and wheeled or tracked vehicles. E-suits only suffer a 10% loss in speed.

Barrier Foam is generated from a detergent and a water source such as a reservoir. The detergent is stored in five liter bags. Each bag mixes with a hundred liters of water to generate 150 cubic meters of foam in ten minutes. The foam fills in the lowest elevations in a one hundred meter radius and then builds up to a maximum height of 130cm.

Sprayer Mass: 80 Kg
Cost: ¥9,200

Detergent (5 liter)
Mass: 5 KG
Cost: ¥800

Aqueous Barrier Foam Riot Control Agent

The ordinary suds of barrier foam can be enhanced with the addition of chemical irritants similar to those found in teargas. (See: Chemical Irritants.) Any animal (including humans) not sufficiently protected will suffer from the effect of the chemical irritant until they can be washed down with large quantities of water. Body armor by itself will protect for a short period of time, but the fluid will slowly leak through joints and into fabric. The most effective defense against the irritant is wearing a chemical suit or Vac-suit.

Effects: Victims feel as if their skin and eyes are burning. This often causes the victim to panic and flee. If the victim panics they must do whatever they can to run out from the foam.

Save vs. Panic: Psyche roll -40 or Constitution roll -40

CS riot control agent (5 liter)
Mass: 5 KG
Cost: ¥1,600

Personnel Net Gun

Fires a net that entangles a human target. The net is 6 meters wide and employs glue-coated strands. The glue can be removed by spraying or pouring on a solvent. The weights have been known to injure targets with relative frequency.

Effect: The net uses a weighted glue coated net to entangle a target. Victims are immobilized.

Save vs. immobilization: Strength roll. Must roll under the victim's 1/2 fraction column to remove the net.

	PB	S	Med	L	Ex
Damage:	8	4	2	1	stun

Range Class: A
Payload: 1
Rate of fire: 1
Mass: 750 g
Cost: ¥8,000

Nets
Mass: 2 Kg
Cost: ¥1,000

Vehicular Net Cannon

The net cannon fires a steel cable net that is 9 meter wide and can envelop a car or armored vehicle.

Effect: The net uses a weighted steel net to entangle a target. Vehicular targets under 4 meters long are immobilized.

Save vs. Personnel immobilization: Strength roll. Personnel must roll under the victim's 1/2 fraction column to remove the net.

Save vs. Vehicular immobilization: Piloting roll. The vehicle pilot gets one chance to make a successful piloting roll or the vehicle is trapped.

	PB	S	Med	L	Ex
Damage:	20	10	5	1	stun

Range Class: B
Payload: 1
Rate of fire: 1
Mass: 90 Kg
Cost: ¥40,000

Nets
Mass: 40 Kg
Cost: ¥40,000

Bucha Strobe Grenade

The Bucha strobe effect is a high intensity strobe light that flashes near human brain wave frequency causing vertigo, and disorientation.

Effects: Victims are disoriented -20 to IQ -10 to Agi -20 to Dex -30 to Con -10 to Str -20 to Psy.
Save vs. Disorientation: Constitution roll or Psyche roll. Victim must roll under either their Constitution or Psyche.

Blast Range Class: A
Duration: 20 Turns
Mass: 680 g
Cost: ¥760,000

Photic Driver

The Photic Driver uses infrared strobes and high power ultrasound to create a disorienting effect that is not easily identified. The victim feels dizzy and of balance because of the inner ear being bombarded by pulsing ultrasound. The flashing infrared strobe penetrates closed eyelids and causes skin discomfort. The effect can cause those prone to epileptic fits to go into convulsions.

Effects: Victims are disoriented -10 to IQ -10 to Agi -20 to Psy. +1 stress point per 5 turns of exposure.

Save vs. Disorientation: Psyche roll. Victim must roll under their Psyche.

Blast Range Class: A
Duration: according to the availability of electricity.
Mass: 31 Kg
Cost: ¥391,000

Chemical Irritants

Teargas Grenade
Effects: Victims feel as if their skin and eyes are burning. This often causes the victim to panic and flee. If the victim panics they must do whatever they can to run away from the teargas.

Save vs. Panic: Psyche roll -effect modifier or Constitution roll -effect modifier

	PB	S	Med	L	Ex
Effect:	-40	-40	-30	-10	-5

Blast Range Class: A
Mass: 175 g
Cost: ¥4,000

Electrically Activated Teargas Grenade

This type of teargas grenade is similar in operation to a normal teargas grenade except that it is activated by an electrical charge. This type of grenade is most often installed as a defensive measure inside of bunkers and vehicles.
Effect: (see: Teargas Grenade)

Oleoresin Capsicum Spray (pepper spray)
Effects: Victims feel as if their skin and eyes are burning. This often causes the victim to panic and flee. If the victim panics they must do whatever they can to run away from the spray and are otherwise incapacitated for 1d6 turns.

Save vs. Panic: Psyche roll -30 or Constitution roll -30

Range: 3 meters
Payload: 3-10
Rate of Fire: 1
Mass: 80-200 g
Cost: ¥200-600

Disposable Riot Control Launcher

This hand held launcher consisting of an aluminum tube with a hand activated striker on it's base. The launcher uses a low power charge to propel a rubber teargas grenade.

Effects - Teargas Grenade: (see: Chemical Irritants, Teargas Grenade)

Range Class: B
Payload: 1
Rate of Fire: 1
Mass: 250 g
Cost: ¥7,000

Chemical Cocktails

These concoctions are not normally sold, but are made by a character with the chemistry skill.

Molitov Cocktail

The simplest of concoctions, any flammable liquid is poured into a glass bottle. A rag is placed in the neck and lit. The entire bottle is then thrown at a target. These are not sold pre-made but the price is for the components.

	PB	S	Med	L	Ex
Damage:	8	5	4	2	1

Blast Range Class: A
Duration: 3 turns
Mass: 500 g
Cost: ¥40

Stink Bomb

Stink bombs are generally composed of two or more chemical agents that when mixed, generate a putrid odor that is unpleasant but will not cause any negative health effects. This type of device is most often used to clear an area before the target knows it is being attacked.
Effects: Victims are repulsed by the foul smelling gas. This causes the victim to flee the odor.

Save vs. Flee: Psyche roll

Mass: 200 g
Cost: ¥200

Noxious Gas Bomb

This is a generic listing for a simple device that mixes two or more chemicals to generate a toxic gas. This gas in question is usually something like chlorine gas. The gas will generally have a disagreeable odor, cause the victims to become ill after several minutes of exposure and possibly death on longer exposures.

Effects: Victims are repulsed by the foul smelling gas. This causes the victim to flee the odor. If the target does not flee the area they will become sick in 2D6 turns unless a successful roll vs. Constitution is made. However the target must roll 1D6 again for the number of turns that they have to roll vs. Con again. Every successful Constitution roll only delays the effects of the gas for another 1D6 turns. Victims that become ill are incapacitated for 2D10 turns. Once the victim becomes ill they must make a roll vs. Con or they will die in 2D10 turns unless removed from the gas.

Save vs. Flee: Psyche roll

Mass: 200 g
Cost: ¥200

Acids

Acids are corrosive chemicals. For the purposes of this heading, only industrial strength acids will be considered. The main use of acids is to destroy chemical weapons and are used to quietly burn through armor of hardened structures. Weaponized acids are prohibited by international treaty and therefore Field Engineers must be very careful with how they are used. Acids are used to dissolve metals and organic compounds. However there use on personnel is prohibited. Acids may be used on structures. Even their use on vehicles has been prohibited. Acids ignore armor ratings but are only effective against specific materials that are mentioned along with each acid.

Wear rubber gloves, facemask or safety glasses, apron, and ensure good ventilation. Do not assume that gloves provide an impenetrable barrier to the acid.

Aqua Regia (Latin, "royal water")

Aqua Regia is a mixture of concentrated hydrochloric and nitric acids. Aqua regia was used by alchemists and its name is derived from its ability to dissolve the so-called noble metals, particularly gold, which are inert to either of the acids used separately. Aqua Regia is transported in

opaque vials that hold the hydrochloric and nitric acids in separate containers. When the lid is unscrewed, it breaks the containers that keep the constituent acids separate. The solution can then be applied to the target.

Proper protection should be worn when using Aqua Regia as it is extremely corrosive. Inhalation of vapor can cause serious injury. Ingestion may be fatal. Liquid can cause severe damage to skin and eyes.

Damage: 2 points per turn for 5 turns on most materials.
Volume: 250 ml
Cost: ¥400

Hydrochloric Acid (concentrated)

Hydrochloric acid is a powerful corrosive that can dissolve metals and organic materials. It is not effective on glass and ceramics. Proper protection should be worn when using hydrochloric acid as it is extremely corrosive. Inhalation of vapor can cause serious injury. Ingestion may be fatal. Liquid can cause severe damage to skin and eyes and permanent damage.

Damage: 2 points per turn for 5 turns on metals (excluding gold and platinum) and organic materials (includes CCC).
Volume: 250 ml
Cost: ¥40

Hydrofluoric Acid

Hydrofluoric acid is corrosive to glass, concrete, silica, and metals. It is also extremely toxic even when inhaled or through skin contact.

Proper protection should be worn when using hydrofluoric acid as it is extremely corrosive. Inhalation of vapor can cause serious injury. Ingestion may be fatal. Skin contact may be fatal. Acts as a systemic poison, any contact with this material requires immediate medical attention.

Damage: 1 point per turn for 3 turns on metals (excluding gold and platinum). 1 point per turn for 5 turns on organic materials (includes CCC). 2 points of damage for 3 turns on glass, ceramics and concrete. 2 points per turn for 7 turns as a ingested poison. 1 point of damage per turn that the vapor is inhaled.

Volume: 400 ml
Cost: ¥60

Nitric Acid (concentrated)

Concentrated nitric acid is a powerful corrosive that can dissolve metals and organic materials.

Proper protection should be worn when using nitric acid as it is extremely corrosive. Inhalation of vapor can cause serious injury. Ingestion may be fatal. Liquid can cause severe damage to skin and eyes and permanent damage.

Damage: 3 points per turn for 2 turns on metals (excluding gold and platinum) and organic materials. 1 point of damage for 5 turns on glass, ceramics and concrete.
Volume: 250 ml
Cost: ¥55

Sulfuric Acid (concentrated)

Concentrated sulfuric acid is a powerful acid that also reacts violently with water. It is even more effective when heated. Sulfuric acid dissolves organic materials and is often used as a desiccating agent. Heated sulfuric acid can dissolve most metals (excluding gold and platinum). Sulfuric acid when mixed with water causes a violent reaction that releases heat. If the two are mixed quickly this reaction can cause water to boil and explode into steam this can splash hot sulfuric acid over a one meter area.

Proper protection should be worn when using sulfuric acid as it is extremely corrosive. Inhalation of vapor can cause serious injury. Ingestion may be fatal. Liquid can cause severe damage to skin and eyes and permanent damage including blindness.

Damage: 1 point per turn for 2 turns on metals (excluding gold and platinum). 2 points per turn for 5 turns on organic materials.

Damage Heated: 1 point per turn for 5 turns on metals (excluding gold and platinum). 3 points per turn for 5 turns on organic materials.

Volume: 300 ml
Cost: ¥55

Vehicles

Earth Vehicles

Type **Wheeled**
Model **Quad ATV**

These four wheeled all terrain vehicles are excellent short range transports. They can travel at speeds in excess of 120 kph.

Overall height	.62 m
Overall width	1.2 m
Overall length	2 m
Dry Mass	300 kg
Full Mass	380 kg
Power plant type:	Internal combustion

Movement

top speed	120 kph
Total fuel capacity:	3 hours
Fuel type:	Gasoline

Armor Rating: 3
Hit Points: 25
Crew: 1
Passengers: 0-1
Piloting Modifier: 0
Cost: ¥100,000

Earth Vehicles

Type Wheeled
Model ARC30

Armored Reconnaissance Carrier 30

The Armored Reconnaissance Carrier is a multifunction wheeled vehicle that can be refitted to a large verity of functions. The vehicle is amphibious and fully all terrain. The front of the vehicle has a crew cabin for a pilot and vehicle captain. The vehicle has eight large wheels that allow it to traverse obstacles under 1 meter high. The pilot can adjust the tire pressure in any or all of the tires to adjust to driving conditions. There is a light turret three quarters of the way to the back of the vehicle and twelve weapon ports that allow passengers to fire small arms out of the vehicle.

The crew and engine compartments have automatic fire detection and suppression systems.

Overall height	3.1m
Overall width	3.4m
Overall length	6.7m
Dry Mass	12,430 kg
Full Mass	13,909 kg
Power plant type:	Internal Combustion

Movement

Top Speed	70 kph
Total fuel capacity:	12 hours
Fuel type:	Petroleum Diesel

Armor Rating: 20
Hit Points: 800
Crew: 2
Passengers: 15
Piloting Modifier: -10
Cost: ¥38,000,000

Turreted Medium Machine gun

	PB	S	Med	L	Ex
Damage:	15	15	12	10	8

Range Class: C
Payload: 2000
Rate of Fire: 60
Fire Arcs 1-8

Turreted Heavy Machine gun

	PB	S	Med	L	Ex
Damage:	20	20	18	16	10

Range Class: C
Payload: 500
Rate of Fire: 45
Fire Arcs 1-8

Six Smoke Grenade Launchers

	PB	S	Med	L	Ex
Vision PDF:	-70	-50	-30	-10	-5

Blast Range Class: A
Range Class: B
Payload: 6
Rate of Fire: 6
Fire Arc 6

12 Weapon Ports

Weapon ports are slots with small armored flaps to protect passengers. These

slots are not operable from the outside of the vehicle. From the inside of the vehicle, simply pushing small arm's barrel through the port will open the door allowing the passengers to fire out of the vehicle.

2 Ports in Crew Compartment
Fire Arcs 1-3
1 Port in Crew Compartment
Fire Arcs 3-5
1 Port in Crew Compartment
Fire Arcs 1, 7 + 8
4 Ports in Passenger Compartment
Fire Arcs 3-5
4 Ports in Passenger Compartment
Fire Arcs 1, 7 + 8
2 Ports in Passenger Compartment
Fire Arcs 5-7

ECM: -5 to skill
Range Class: C
Sensors: -10 to Int
Range Class: D
Shields: 1 active at 100hp
Cargo Capacity: 5000 KG

Shield information
No. of shields 1 (Arcs 1-3)

Fire Arcs

1	2	3
8	●	4
7	6	5

Hit locations 1d10

Arc 1	Arc 2	Arc 3	Arc 4	
1-4	1	1	-	L Side
5	2	2-5	1-5	R Side
6-8	3-7	6-8	6	Front
- -	-	7	Back	
9-10	8-10	9-10	8-10	Turret

Arc 5	Arc 6	Arc 7	Arc 8	
1	1	1-4	1-5	L Side
2-5	2	5	-	R Side
-	-	-	6	Front
6-8	3-7	6-8	7	Back
9-10	8-10	9-10	8-10	Turret

Critical hits 1d10
Front 20% chance of critical
1-2 Cockpit, pilot killed
3-4 Shield generator destroyed
4-10 Ammo Explosion! passengers killed, APC disabled

Back 35% chance of critical
1-3 Fuel Explosion! 500 points 10m blast radius
4 Shield Generator destroyed
5-10 Engine damage, all systems at half power.

Side 70% chance of critical
1-10 Wheel damaged drop top speed by 10 KPH

Turret 50% chance of critical
1-4 Heavy machine gun destroyed
5-7 Medium machine gun destroyed.
8-10 Sensor system destroyed -20 to sensor, ECM, + ECCM rolls

VARIANTS:

ARC30-RCB (Radiological-Chemical-Biological Reconnaissance Vehicle)

This is the chemical reconnaissance version of the ARC30. It is equipped with lane-marking poles and flags. The flag/pole dispensers are located on the rear corners of the vehicle hull. The RCB has a sealed hull and a eight hour oxygen supply. This chemical reconnaissance version is armed only with twin medium machine guns.

ARC30-2C (Command Vehicle)

This is the commander's variant of the ARC30, and is equipped with an advanced sensor navigation and communication package. The vehicle enables the commander of a motorized rifle battalion to control his unit and maintain communications with the regimental commander. For this purpose it is fitted with two Video transmitters, two portable video transmitters. The ARC30 command vehicle consists of a ARC30 with the turret removed and additional radios and antennas added. There is also a generator, which is often mounted on the vehicle roof. Immediately behind a central hatch which is in place of the turret. With a wider and raised superstructure, the vehicle gives greater space for operators and additional equipment.

ECM: -10 to skill
Range Class: C
Sensors: +20 to Int
Range Class: D
Shields: 1 active at 200hp

Shield information
No. of shields
1 (Arcs 1-3)

ARC30 with Heavy Missile Launcher

This vehicle consists of a ARC with its turret removed and in its place, a quadruple heavy missile launcher. This missile weighs 29.48 kg and has a range of 3500-m. A total of eight missiles are carried including the four in the ready to launch position.

	PB	S	Med	L	Ex
Damage	11000	9000	9000	3000	900

Blast Range Class: B
Range Class: D
Payload 8
Rate of fire 4
Fire Arcs 1-3

ARC30 with Retractable Missile Launcher

This vehicle is ARC30 with its turret removed and fitted with a platform, under which are mounted six light missile launch tubes. This platform is carried within the hull under armor protection while traveling. When engaging targets, the platform is raised. The gunner, who is seated on the right side of the vehicle, controls the missile through a sight mounted on the front right of the vehicle roof. The vehicle carries eight additional missiles, and the platform can be rearmed while lowered.

	PB	S	Med	L	Ex
Damage	1000	500	500	250	50

Blast Range Class: B
Range Class C
Payload 12
Rate of fire 1-4
Fire Arcs 1

ARC30 with Heavy Missile Turret

This vehicle consists of the ARC30 with the turret removed and replaced with a rotating heavy missile launcher. The crew reloads the launcher through a small hatch located behind it. The gunner controls the missiles through a sight mounted on the front right of the vehicle. The vehicle can carry 10 missiles to reload the launcher.

	PB	S	Med	L	Ex
Damage	11000	9000	9000	3000	900

Blast Range Class: B
Range Class: D
Payload 10
Rate of fire 1
Fire Arcs 1-8

ARC30 with Surface to Air Missile System

This version consists of a rotating surface-to-air missile launcher/turret mounted on a modified ARC30 chassis (the belly-wheels have been removed). The launcher/turret is fitted with four infrared-seeking, fire-and-forget missiles, and is manned by one man. Additional missiles can be carried on either side of the hull.

Infra-red Guidance System
Percent to Re-acquire: 75%

	PB	S	Med	L	Ex
Damage:	3K	1,500	1,500	750	150

Blast Range Class: A
Range Class: E
Payload: 4
Rocket Mass: 78.4 Kg
Fire Arcs 1-8

ARC30-P Maintenance Assistance

A number of older ARC30 APCs have been converted for use in the maintenance assistance role and have a raised tarpaulin cover over the troop compartment that runs almost to the rear. Consists of an ARC30 with the turret removed and replaced with a crane and other repair equipment. Standard equipment includes an A-frame, winch, tow bars, small stowage platform to the turret rear and stabilizers under the nose of the vehicle. This vehicle is not armed.

ARC30 Medical Vehicles

The ARC30 vehicle has been adapted to a series of medical vehicles. The M-1 is a medical evacuation vehicle, The M-2 is a battalion medical station, and the M-3 is a mobile dressing station with a team of doctors and their equipment. Up to four casualties on stretchers can be carried inside the hull, and an additional 12 can be housed in an attached tent.

ARC30A

This vehicle incorporates a new turret system, which is of all welded steel construction. Mounted externally on the top of the turret is a medium automatic cannon. A medium machine gun is mounted coaxially to the right of the cannon. The heavy machine gun is removed on this model. Mounted on

either side of the cannon is a bank of three additional electrically operated, smoke grenade launchers. Turret traverse is through 360 degrees with weapon elevation being between -5 and +70 degrees.

Medium Automatic Cannon

	PB	S	Med	L	Ex
Damage:	100	100	90	70	50

Range Class: D
Payload: 100
Rate of Fire: 7
Fire Arc 1-8

Six Smoke Grenade Launchers

	PB	S	Med	L	Ex
Vision PDF:	-70	-50	-30	-10	-5

Blast Range Class: A
Range Class: B
Payload: 6
Rate of Fire: 6
Fire Arc 1-8

Earth Vehicles

Type Unmanned Helicopter

Model Guardian

The Guardian VTOL is a remote surveillance and strike vehicle. It is capable of launching off the back of a truck and can land in a space 15 meters around. The Guardian is not autonomous and must be piloted from remote. This can cause some significant limitations to its use in the underground. There have been instances that Chezbah priests have taken control of the VTOL despite the use of safeguards.

The Guardian VTOL has a variant developed for use on The Artifact. Because of earth forces inability to launch their own communications satellites, their ability to co-ordinate troop movement has been limited. However the Guardian's ability to hover at over twenty thousand feet, makes it an effective surrogate. The G-Com1 is a communications variant that can be used to oversee the battlefield and give commands from afar.

Overall height	1.2m
Overall width	2.1m
Overall length	2.1m
Dry Mass	3693 kg
Full Mass	4820 kg

Power plant type: Internal combustion

Movement

Flying Top Speed	500 kph
Total fuel capacity:	7 hours
Fuel type:	Gasoline

Armor Rating:	5
Hit Points:	70
Barrier Points:	60
Crew:	0
Passengers:	0

Piloting Modifier: 0
Cost: ¥1,000,000

Missile Rack

	PB	S	Med	L	Ex
Damage	900	700	500	250	50

Blast Range Class: B
Range Class C
Payload 5
Rate of fire 5
Fire Arcs 1

ECM: 0 to skill
Range Class: C
Sensors: +5 to Int
Range Class: D

Fire Arcs

\ 1 /
4 ● 2
/ 3 \

Hit locations 1d10

Arc 1	Arc 2	Arc 3	Arc 4	
1	1	1	1	Landing Gear
4-7	4-7	4-7	4-7	Body
8-10	8-10	8-10	8-10	Rotor

Critical hits 1d10

Landing Gear 80% chance of critical
1-10 Landing gear destroyed.
Body 60% chance of critical
1-2 Sensor system destroyed -20 to sensor rolls
3-4 Ammo explosion! 200 pts 5m blast radius
5-6 Missile Rack Destroyed
7-8 Fuel Explosion! 40 points 10m blast radius
9-10 Engine damage, all systems at half power.

Rotor 99% Chance of critical
1-3 Minor damage slow descent to the ground.
4-10 Major damage, crash landing!

Variants: G-Comm1 Command Vehicle

The G-Comm1 is a command and co-ordination vehicle that is used to observe and communicate with units up to 100 kilometers away from the command post. This variant is unarmed.

Sensors: +20 to Int
Range Class: E

Scimrahn Vehicles

Type Anti-Grav
Model Rapid Attack Transport

This light AG vehicle is used by the Scimrahn in guerilla actions against the Chezbah.

The R.A.T. as it is called by Earth forces (restor pid or fast strike in Scimrahn) is one of the smallest AG vehicles and the only one to have it's own defensive force field.

Overall Height	40 cm
Overall Width	86 cm
Overall Length	2.4 m
Full Mass	423 kg

Power plant type: Plasma Coil

Movement

top speed	120 kph
Total fuel capacity:	2 hours
Fuel type:	Plasma

Armor Rating:	15
Hit Points:	50
Crew:	1
Passengers:	0
Piloting Modifier:	0
Cost:	¥57,000,000

Shields: 1 active at 200 hp

Shield information
No. of shields 1 (Arcs 1 or 3)

Fire Arcs

\ 1 /
4 ● 2
/ 3 \

Hit locations 1d10

Arc 1	Arc 2	Arc 3	Arc 4	
1-4	1-3	1	1-3	AG Eng
5-9	4-7	2-3	4-7	Body
10	8-10	4-10	8-10	Thrusters

Critical hits 1d10

Body 60% chance of critical
1-6 Pilot hit
7-8 Shield Generator Destroyed
9-10 Controls Destroyed -40 to Piloting skill

Thrusters 40% chance of critical
1-4 Fuel Explosion! 100 points 10m blast radius
5-10 Thruster damage, cut flight speed in half.

AG Eng 20% Chance of critical
1-6 Minor damage slow descent to the ground. RAT inoperative!
7 - 10 Major damage, crash landing!

Type Armor
Model Powered Armor

A light weapon system that is used as a quick strike platform. Powered Armor uses a plasma coil to power the system. While not a vehicle in itself, the powered armor does have shield generators and weaponry that make it nearly a match against an E-suit at close range. The prohibitive cost to build the suits does however prevent their widespread use. In addition, the armor is very heavy and the user must support the bulky armor slowing movement and tiring the user.

Overall Height	Varies
Overall Width	80 cm
Overall Length	89.5 cm
Full Mass	52 kg

Power plant type:	Plasma Coil
Total fuel capacity:	4 hours

Armor Rating: 100
Hit Points: 200
CDF Modifiers
Ref: -20
Int: -5
Agi: -15
Dex: -15
Cost: ¥24,000,000

Particle Spear

The particle spear is powered through a conduit in the arm.

	PB	S	Med	L	Ex
Damage	350	300	100	20	2

Range Class: B
Rate of Fire: 1
Mass: 2.8 Kg
Shields: 1 active at 300 hp

Scimrahn Survival Gear

E-Suit Finger Camera

The finger camera replaces the tip of one of the TF-2394 index fingers (usually the left). It can rotate 360 degrees and swivel 90 degrees on the tip of the finger. It is used to look around corners and into places that would be difficult to get the sensor head into.
Mass: 400 g
Cost: ¥2,500

E-Suit Life Support Backup

The Life Support Backup is a system of batteries that store power while the E-Suit is functioning. If the E-Suit is damaged, exceeds its fuel capacity or the E-Suit cannot make it to safety, the Life Support Backup can keep the pilot alive for up to two days.
Mass: 110 Kg
Cost: ¥35,000

E-Suit Re-entry System

The TF-2394 is capable of launching into orbit at the poles, with the aid of an anti-grav engine or a booster rocket (see: The Artifact, Vehicles, TF-2394 Additional Hardware). However it must move back to the poles to make a safe re-entry unless it is using an anti-grav engine. In many cases this can be impractical because the total trip can exceed the total fuel capacity of the E-suit. When this is the case, a Re-Entry system is desirable.

The Re-Entry system is an inflatable balloon and tail system that both protects and stabilizes the E-Suit. The balloon inflates in front of the E-Suit to form a protective thermal barrier, while the tail is a fabric ribbon that trails five hundred meters behind the E-Suit with a parachute pod at it's end. Once the suit reaches thirty thousand feet above the surface, the parachute is deployed and the balloon deflates allowing the E-Suit's thrusters to fire. If the E-suit does not have enough fuel to fire it's thrusters. It can leave the balloon inflated and use it as a cushion in a crash landing. In this event the balloon bursts on impact in a controlled fashion, ejecting its gasses back at the E-Suit. This further slows the Suit's decent. However the safety record of these landings are questionable.
Mass: 250 Kg
Cost: ¥1,500,000

E-Suit Saddle Pods

E-Suits are not normally designed to carry much more than a passenger. Saddle pods bolt to the upper legs of an E-Suit and allow a small amount of personal items and food to be transported with a minimum impact on the function of the E-Suit.
Capacity: 100 Kg
Mass: 40 KG
Cost: ¥7,000

Freezer Unit for Scimrahn Freighters

These refrigeration units run off the Freighter's power and cool the contents of the freighter. If fully frozen, many food items can be carried for upwards of six months to a year. However some foods do not freeze well and may be damaged by the freezing process.
Mass: 140 KG
Cost: ¥100,000

Helmet HUD

Scimrahn armor is designed to take a number of add on components. On of these is a Heads Up Display that fits into the helmet visor of both Scimrahn light and heavy armor. The HUD can display text and low resolution video.
The HUD is most often used along with the Scimrahn Comm/Comp and is installed inside the helmet.

Mass: 110 g
Cost: ¥3,000

Listening Spike

The Listening Spike is an interesting sensor device that fires a small HDCCC spike into a nearby solid surface. The device then listens for vibration in that surface detecting the vibration of vehicles, footsteps etc. Although the unit's range is approximately one kilometer, it can be extended by the S-15 E-suit.

The Listening spike may detect ambient noise such as a conversation in a shorter radius but the fidelity of the sound is sometimes poor.
Sensor range class: C
Ambient noise range Class: B
Mass: 950 g
Cost: ¥70,000

Scimrahn Shelter Bag

The shelter bag is very popular among lone scouts. It is similar to a sleeping bag but is designed to completely envelop the person in it. The bag is infrared ablative and normally camouflaged to help prevent detection while the user is sleeping. The bag is designed to protect from the extreme cold that is common in the recesses of the underground and is rated to -25 degrees Celsius.
Mass: 1.1 KG
Cost: ¥3,000

Surgical Box (Kelrath)

The Scimrahn trade with the Kelrath primarily for food, but there are some items that the Kelrath manufacture that the Scimrahn cannot replicate. One such item is the Kelrath Surgical Box. The box is a cube sixty centimeters to a side and has four extendible legs. On top of the box is two holes that the operator reaches into to control the box. Also on top of the box is a view screen used to monitor the patient. The underside of the box is an array of fifty manipulators each with a different purpose. Heavy manipulators can spread open the chest cavity, while light manipulators can move and hold body tissues. Lasers are used to cut and cauterize. Tiny optical and sonic probes can enter in to the body and show the surgeon what they could not otherwise see. Special manipulators can grab hold of veins and arteries and bridge them to resume normal blood flow. A pump can take over heart function for a period of up to five hours. The Box's four extendible legs hold it several centimeters from the patient's body, and the operator stands over the patient.

The Surgical Box is not a common medical device even for the Kelrath. Only the best of Kelrath doctors could afford to buy this device. As a result, there have only been a few of these devices that have been made available for trade.
Mass: 200 KG
Cost: ¥30,000,000

Laser Sound Projector

The laser sound projector is a device that uses two crossing ultraviolet laser beams to generate a tiny field of heated gas. The heated gas hums quite loudly. The pitch of the humming can be modulated to emulate a range of sounds including human voices and the hiss of plasma fire. However the heated gas is luminous and can be seen for a significant distance. Because of this, the heated gas blob is often projected in a location that is hidden from sight.
Range: 300 meters
Mass: 20 Kg
Cost: ¥120,000

Scimrahn Smoke Pod

This device is either dropped or hung from a belt and creates a thick billowing cloud of smoke that is opaque. The Smoke pod is a defensive device that is effective primarily against lasers and to obscure the vision of enemy troops, but is also marginally effective against plasma weapons. The primary disadvantage of the smoke pod is that those using it are often unable to see out of the smoke. Even infrared optics have difficulty cutting through the dense smoke that is formulated to diffract photons.
Effect: All laser weapons firing through the smoke have their range class diminished by one letter. (for example: Range Class B becomes A. Range Class C becomes B, Etc.) All low energy lasers such as those used in sensors and counter measures (ECMs) are completely ablated. In addition, targeting any object through the smoke has a negative PDF to hit due to vision being obscured. (Note: Sonic and magnetic sensors are unhindered by the smoke and therefore have no negative modifiers.)

	PB	S	Med	L	Ex
Vision PDF:	-90	-80	-60	-20	-5

Blast Range Class: A
Mass: 334 g
Cost: ¥6,000

Scimrahn Weapons

Discharge Laser

The ion laser uses two ultraviolet lasers to create a path for electricity to travel. In this manner the Discharge laser is able to stun an unarmored target along with normal laser damage.

Effects: Unarmored victims are rendered unconscious. If the target's armor is breached by the laser beams, the stun is also effective.

Save vs. stun: Constitution roll or Psyche roll. Victim must roll under the 1/4 fraction column. Victims over 125 kg have a plus ten to their 1/4 fraction column for the purposes of this roll.

	PB	S	Med	L	Ex
Damage:	13	12	6	3	1

Range Class: B
Payload: 50-250 Backpack
Rate of Fire: 1
Mass: 3.8 KG
Cost: ¥45,000

Mass Spear

This weapon is a combination of a thudstick and a spear. The weapon is engaged when thrust forward and like the thudstick multiplies the impact force of the spear to break through armor.
Damage: 45
Range: 2 meters
Payload: 10
Rate of Fire: 1
Mass: 2.5 kg
Cost 70,000

Plasma Pike

Before the Scimrahn had the ability to manufacture E-suits the Plasma Pike was their only means of defeating a Chezbah E-suit. Despite their best efforts to refine the design, it often required a lucky shot or the use of a number of the Plasma Pikes to take down a single E-suit.

The Pike is a two and a half meter long weapon that carries a single charge. However the lack of a high power magnetic bottle makes the weapon impossible to hold while firing. The flash from the plasma ejection is hot enough to kill or severely injure anyone within two meters of the weapon. To fire the weapon, it is driven into the ground, aimed and then a timer is engaged. The timer gives just enough time to flee the lethal blast radius.

This weapon can be refilled from a plasma conduit without any additional equipment.

The blast range class for this weapon is centered on the Pike itself. The Pike itself has an armor rating of 30 and is not damaged in firing.
This weapon requires it's own weapon skill. (WS Plasma Pike)

	PB	S	Med	L	Ex
Damage	600	300	250	150	50
Blast Damage	30	10	5	1	1

Range Class: C
Blast Range Class: A
Payload: 1
Rate of Fire: 1
Mass: 15 Kg
Cost: ¥200,000

Pulser cannon

The Pulser cannon is usually used to defend a location from attacking vehicles. The weapon is so large that few vehicles can carry it.

This high-energy device directs a high frequency radio burst and is tuned to rupture magnetic fields. While devices like magnetic mines also do this, the disruption cannon is designed to penetrate magnetic shielding used in plasma containment units. The intended effect is a breakdown of the plasma's magnetic bottle, and causes a rupture. The Pulser cannon has three other effects. One, the device will do damage to shield generators. If the pulse disrupts the forcefield enough that it collapses, the shield generator is destroyed. Second, any computer controlled vehicle that is struck by the pulse, suffers a critical hit equivalent to it's computer being destroyed (This will usually be a -50 to pilot the vehicle). Third, liquid fuels have a 30% chance of exploding and living creatures suffer damage as listed below due to liquids boiling from the energy.

The intended effect however is that if the disruption damage is higher than the damage of any plasma weapons on the vehicle than the vehicle suffers an ammo explosion equal to the combined damage of it's plasma payload.

Disruption damage

	PB	S	Med	L	Ex
Damage	2000	1500	1000	500	100

Living tissue damage

	PB	S	Med	L	Ex

	PB	S	Med	L	Ex
Damage	90	70	45	30	10

Range Class: C
Rate of Fire: 1
Mass: 45,00 Kg
Cost: ¥70,000,000

Vortex Cannon

A more powerful variant of plasma weapons. Not only does the Vortex Cannon do damage as normal plasma would, gas pressure from the vortex causes a physical impact.

The vortex Cannon is available as a TF-2394 Optional Weapon System.

	PB	S	Med	L	Ex
Damage	700	700	450	350	120

Range Class: C
Payload: 10
Rate of Fire: 1
Mass: 1564.5 Kg

When this weapon is mounted the top speed of the E-suit is dropped ten (15) kph and flight is not possible.
Cost: ¥6,200,000