

Frontier Report

A Traveller Fanzine



Issue 1

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News from the frontier

Welcome to this first issue of Frontier Report, this new fanzine actively supports all editions of traveller with the exception of the current ruleset published by Mongoose Publishing. Because this fanzine complies with the fair use policy we're unable to provide any support for the Mongoose Ruleset, although to be fair we'd like to, but having to do so within the limited terms of the Fair Use policy meant too much restriction for our tastes as we genuinely love the Original Traveller Universe that has seen us through, Classic Traveller, MegaTraveller, Traveller The New Era, Marc Miller's Traveller T4, Gurps Traveller, Traveller 20, not to mention a whole host of other traveller systems such as Action Traveller and Hero Traveller. Whilst there's something to respect and love in each of those editions, Frontier Report is concentrating it's support on D6 versions of Traveller for ease of conversion between the rules. So at present we will accept submissions for any milieu provided that any rules or game mechanics are usable with a couple of six sided dice. This naturally lends more support to the original traveller rules and the later developments of MegaTraveller and Marc Miller's Traveller T4. Submissions for other rule sets will be held back until we have enough material to release a special edition issue (in addition to our normal publishing schedule) which will concentrate purely on that particular game system, for example a special edition that is packed from cover to cover with Traveller: The New Era rules and material, Gurps or T20 etc.

Frontier report is modelled on the old MegaTraveller Journal, a large, authoritative and well thought out publication that was a delight to read as well as full of really useful resources. In addition to lots of stand alone articles the MegaTraveller Journals also contained useful setting information and linked adventures. Frontier report aims to be a continuation of this fine tradition. I for one hope that it works. Each issue will be packed full of stuff and will probably be released every six months provided we can get the support of the community in the form of submissions.

In this first issue, we've turned our attention to Marc Miller's Traveller T4, this is because, firstly I love it and secondly, submissions have been sadly lacking despite appeals (with the exception of the fantastic artwork provided by Andrew Boulton, David Redington and Zach Wolfe), so my favourite d6 version of Traveller won out. It's my favourite version because I really liked the hard science technical assumptions of Traveller The New Era though found some aspects of the game too complex for detailed play, Seeing T4 in it's true light I could see the wisdom and catch a glimpse of Marc Miller's vision for T4. It was a bold attempt to marry some very hard technical assumptions with the more simplistic play of Classic Traveller with a couple of new ideas thrown in. Yes there were editorial problems with most T4 products but this shouldn't put you off. T4 was a great game, though treated badly by a fan base that had become accustomed to ever increasing levels of complexity and publishing standards. Like the more recent versions of Traveller, T4 was created in mind with multiple milieus or ages of adventure in addition to being a stand alone rule system from which to build your own universe. It was also designed to be the simple core of a much greater system that could be expanded upon indefinitely. I also (after many years of dislike) came to love the rules because I could freely tinker with them and create an abundance of house rules, bringing some of the pleasure to me that has been experienced by many Traveller players that first bought the original traveller rules and began their own customisations, many of which found their way into print for the benefit of all fans.

So I am proud to present a new T4 task system and ship building system, (the IDP design system) based on original Fire Fusion and Steel Technical Assumptions. This is meant to fit slickly alongside both the Quick Ship Design System (QSDS) and the Standard Ship Design System (SSDS) whilst giving the designer the freedom to create any design of starship or spacecraft without the limitations of either and is closer in spirit to the excellent UCP design system found in MegaTraveller. The IDP system is completely new from the ground up and is not a reworking of any previous system. Yes some components will obviously share the same physical characteristics as found in previous traveller versions, most notably Jump Drives, Power Plants and fuel requirements as well as armaments, but each item and it's corresponding listing has been engineered from formula found in both versions of Fire, Fusion and Steel and cross referenced against other resources such as the Standard Ship Design System found in the T4 book 'Starships'. The IDP system has been a labour of love for me taking up a great deal of time in design and testing, so much so that my own Traveller website 'www.the-children-of-earth.org' has suffered from a

dreadful lack of attention. In between however I have been submitting adventures to Stellar Reaches (a fanzine that I really enjoy and have been lucky enough to get published in) and will continue to do so even though I will be compiling this fanzine. There are no rivals in Traveller! Stellar Reaches will need your support too, so please send us both your stuff, although don't send me anything you've already sent to Stellar Reaches as its a dreadful waste of space to publish something that already is available for the fans in another publication. Multiple submissions are not encouraged, for more details please check out our [submission guidelines](#).

Future Issues will see the IDP design system expanded upon to allow the quick and easy manufacture of robots and vehicles, though I will need some help and extensive play testing support with this, so please get in touch.

Our special focus on Imperial Life this issue concerns large scale mining and belting operations, originally due to be part of a sourcebook until I found out that Mongoose Publishing were going to re-release Beltstrike. I quickly worked out that the new Beltstrike would probably contain an awful lot of setting information, explanations and rules regarding Belting and Mining operations in the Imperium, so in respect of that, I stopped the large scale belting and mining project just in case anything should clash. I for one do not wish to undermine any one else's products. I seriously doubt that the new Beltstrike adventure will contain any of the information offered in this fanzine. Where overlap (if any) occurs then clearly the official publication I.e. Beltstrike will win out and should be considered the final word, this is as it should be, after all I didn't buy a licence.

Also didn't you think it was odd that there was no Belter career in the T4 rule book, we'll we've fixed that too. The features detailed are just a small sample of all of the stuff put together in this first issue so feel free to browse the fanzine and enjoy. Please send your feedback and your comments to admin@the-children-of-earth.org as always this fanzine belongs to you, the Traveller Fan so get sending your stuff to me at the above email address and I will edit it and include it in the next issue. The special focus for the next issue (approximately six months from now, will be cybernetics and genetic technologies).

Hope you enjoy all of the features in this very first issue of Frontier Report,

Mark (Commander Drax) Bridgeman

Belters



Asteroid Belt Miners or 'Belters' (informally) are seldom thought of as pioneers, the most popular misconception of which is that they are solitary individuals determined to carve out a quiet life for themselves within the empty pockets of known space ripping asteroids apart with explosives or lasers in search of valuable minerals.

In truth belters are highly skilled individuals who for the most part operate in hard vacuum, low gravity (or zero gravity) environments, whether that's strip mining a moon's surface or extracting useful ores and minerals from asteroid or planetoid bodies. Although often distrustful of some outsiders these mineralogical pioneers are gregarious enough to form small semi permanent communities that can be quickly abandoned, asset stripped or packed up when the mineral supply runs out. Often these smaller communities (many of which are based along extended family lines) revolve around a much larger permanent settlement situated on a high value mineralogical site, such as a larger asteroid or small moon.

A high proportion of abandoned settlements found away from system mainworlds are mined out belter habitations. Despite being abandoned these excavated settlements are occasionally useful for storage, smuggling or as a base for criminal activity particularly amongst corsairs, privateers and Free Traders. Known sites are occasionally monitored by the authorities wishing to clamp down on nefarious activities and form part of a regular patrol route.

A prospecting belter is a space trained Geologist by trade, highly educated, self reliant and multi skilled. Belters living in permanent settlements are often more cosmopolitan and business orientated acting as ore traders and brokers, dealing with merchants and corporations (sometimes forming their own new start up companies) and are more akin to professional administrators, business factors or bureaucrats than a simple rock miner. This is because where belters go there is often no other local authority so the larger belter communities have to take upon themselves the full burden of governmental responsibility, law setting, dispute resolution and maintenance of their communities. It should also come as no surprise that permanent belter emplacements usually attract economic migrants from nearby worlds or other belting settlements to work alongside the miners and prospectors bringing whatever expertise they have to bear, often as managers, administrators, medical technicians, entertainers, waitresses, hydroponics technicians, biofarmers or sewage and life support workers. Whilst not all of these jobs are exactly glamorous, belting communities will have the same needs as any other settlement. Most larger scale belter communities will have a handful of dedicated experts in a particular discipline that may spend some or all of their time passing on their skills and expertise to others in the community particularly the young. Thus individuals born to belting settlements are not necessarily disadvantaged or forced to become 'rock miners' due to a lack of choices or opportunities. This is true to a much greater extent amongst the larger scale subsector or sector wide mining conglomerates.

Data Mining

Many so called prospectors spend as much time in front of their computers as they do 'on site' engaging themselves in mineralogical research, mining computers and data centres for geological trends, searching for meaningful patterns amongst apparently randomly located 'claims' whilst using navigational/astrogational programs to track the positions of known planetoids/asteroid bodies in addition to cross referencing known data against survey work previously done. Pulling together all of this information will naturally lead some belters to become excellent researchers and teachers who approach their work with academic pride and meticulous work practices. In short prospecting costs money and is often little more than an educated guess, prior preparation helps edge the bet from an almost zero chance of success to a dead cert.

“When the research is done the ship gets launched... not before...”

Whilst not strictly cartographic scientists and explorers they are none the less very technical, having skills and training programmes that would be on par with those found in some aspects of the Imperial Interstellar Scout Service (IISS). Thus a large proportion of belters will be able to fend for themselves and survive for extended periods of time without assistance in unexplored regions of space, hence the need for a similar type of vessel to the commonly encountered Type S Scout/Courier. Whilst some seekers are built from the keel up as mineralogical prospecting vessels a large proportion of them are modified Scout/Couriers. Despite the popular media image of lone belters visiting distant asteroids in their ore ships being a common staple of holovids and other entertainment formats, only an idiot ventures into the deep vacuum on their own, thus small prospecting vessels are typically home to crews of between 2 and 4 individuals.

This is not to say that belters never work on their own, indeed some hardy individuals may be dropped on a specific asteroid or planetoid with modular quarters and enough provisions to last several weeks, whilst they use automated prospecting equipment to test and drill for minerals. However someone will always know where that person is and help will never be more than a few hours away, it's a rare belter that relishes this type of solitary deployment. Usually such assignments mark that individual as unpopular or as someone being punished for a misdemeanour. The less people on site, the higher the chances of accident and death, hence solitary deployments are typically part of a scheduled drop off and pick up operation that last typically no more than 8 to 24 hours or so called 'easy in, easy out' prospecting deployments.

Larger ore vessels can be any size though are typically between 200 and 5000 tons. In belting circles small is definitely beautiful as larger vessels require more crew and are more expensive to operate, so high demand for minerals need to be in place before any belting company will consider such a large purchase. Whilst most mined resources are shipped to a destination terminus or nearby world for distribution and processing into refined materials (usually metals) some of the biggest ore ships contain mobile smelters, turning raw materials into refined resources, such as steel smelters consuming vast amounts of carbon, water and iron, belching out waste gasses into a thin cloud that frequently follows the ship as it travels along, the exotic gas mixtures of which can be backlit by sunlight into a myriad of beautiful colours and shapes that seem at odds to the intensive industrial processes going on inside the vessel. In regions of high demand these smelter vessels can evolve over time into a smelter station, by deploying itself in a permanent location.

Larger ore vessels are usually supported by smaller subcraft such as modular cutters, pinnaces, launches and shuttles.

Frontier Justice

Most belters will have rudimentary combat skills, where claims are disputed many Astronomical Units or even light years from the nearest authority 'frontier justice' often prevails, whilst unfair this is and always has been a fact of life for small belter communities staking out a new claim. The preferred weapons of choice are small blades, laser weapons and low recoil slug throwers. Inside a habitation this is often replaced by improvised weapons and fists, no one want to be the idiot that fires a slug thrower within a pressurised modular structure when there's no help for several hours or even days.

Radio Silence

Unsurprisingly then, most prospecting belters operate their claims or prospecting sites in almost total radio silence, until the claim can be legally documented and supported. Prospecting vessels are usually parked in the asteroid's sensor shadow, reactors are powered down to a trickle of their normal output and active sensors are not used unless 'EM leakage' can be controlled. Belters returning from a prospecting mission are quite naturally tight lipped hence the stereotype of the sullen rock miner naturally distrustful of outsiders, that is until the claim has been filed, checked and verified as not belonging to anyone else. Claims are filed with the ranking/territorial government responsible for that area of space. Often these authorities are rival mining corporations or other belter communities that are quite happy to fake an audit trail and thus try to steal a claim from a rival belting clan/corporation or settlement. As a consequence belters often hire mercenaries to protect them when they are actively mining a valuable location.

Where the disputed territory cannot accurately be defined as the possessions of a single individual, corporation or system mainworld then the Imperium or local Interstellar Government (if any) is deemed to

be the owning authority. Claims are then impartially recorded, checked and verified at the nearest starport on a first comes, first served basis.

Corporate Bullies

Enter the corporate bullies, often a large mining concern will move into a solar system and deploy large numbers of prospectors in an attempt to cover and claim as much space as possible. Needless to say this often causes friction with any independent miners, already there, when two competing corporations meet, legal disputes and bad feeling can boil over into hot warfare between hot headed belters, corporate security forces (often mercenary units) and rival belting clans. Usually the corporation with the most power will try to usurp or supplant a local company by setting up an identical rival operation undercutting the native firm, a price war can ensue until either one of the companies runs out of money or deems the operation to be unprofitable.

Alternatively some company managers will attempt to deal with the local interstellar authority (usually though not always the system mainworld) on their own terms and cut a deal which freezes out their competitors, dividing an entire solar system into corporate territories, much to the chagrin of any local independent miners that may already have or be in the process of filing claims. Sometimes the company will recognise the legitimacy of those claims and leave the independents in peace, or as is more usually reported force them out in order to mine the discovered resource.

The best of these companies will usually seek to co-opt any resident miners into the system by compensating them for lost claims or offering them financial incentives to work for them such as prospecting/finder's fees, after all there is nothing like local knowledge. The worst of these companies will simply force them off with corporate security forces, mercenaries or the help of any local ruling authority they've managed to successfully deal with. Whilst unfair these deals are nonetheless legal and hence legitimate, though guaranteed to create ill will and bad feeling, not to mention a fair amount of conflict when opposing factions meet in the local star-town's entertainment districts and more seedy areas. It has been known for grievously offended belters to deliberately play chicken with corporate ships in very busy shipping zones and do their utmost to harass the corporate mining crews and personnel wherever possible.

Security Services

In contested space belter security agents are busy and nervous people, rival agents or independents often try to sabotage a well run mining operation, the most popular being a directed (and difficult to prove) micrometeorite impact damaging a crucial facility. Vacuum structures are exceptionally vulnerable to tiny rock fragments travelling at high speed and known space is littered with enough of these micrometeorites (some of which are impossible to detect at a few millimetres wide) that the occasionally though costly event is not deemed suspicious, however when patterns of destruction emerge the game is often up. This is the main reason why most belter habitations are buried deep within the rocky shell of an asteroid/planetoid body with only non essential outlets and access ways on the surface.

Local roughnecks with a grudge are often a pain for security personnel as they will often try to intimidate rival miners both in vacuum and in port, making fights and lethal force a common enough experience in low security regions that news of accidents and deaths are not that wildly reported. Merchant crews are commonly roughed up for transporting ore or delivering goods to or from 'the wrong side'. Official security forces are often run to exhaustion by all of this activity and frequently hire outsiders to supplement or train their existing personnel and occasionally to infiltrate a cabal of known trouble makers.

In the black

Belter operations are dangerous, belters are exceptionally careful individuals when working in 'the black' or the deep vacuum of space, accidents, some of which can be life threatening are all too common, hence experienced medical technicians and vacuum trauma specialists are a must in any operation. Most belter crews will have a mix of mechanical, electronics and science skills and some nearby low berths (just in case). Also self sealing vac suits are the norm where they are available, endless amounts of vac suit patches are always packed amongst their equipment and usually stored in an easy to open pouch on every person's vac suit. In the event of an emergency the first patches to be used are the ones found within the suit of the person experiencing the breach. No belter will voluntarily use one of their own

patches to fix another person's suit, a multitude of reasons exist for this, the most common being that amongst 'the black' you never know when you'll need your own patches and nobody wants to be the person who forfeits their own life because they've kindly patched up a friend. This attitude often extends to equipment and other things hence the stereotype of self reliant beltlers.

Lasers

Shipboard lasers are extremely useful in deep vacuum provided their penetration isn't attenuated too much by clouds of vapour and disturbed dust (this is rarely an issue unless other types of mining are occurring on the same or adjacent sites). In direct comparison (although popular with the media) hand held laser drilling equipment isn't used that often as input energy and focal arrays need to be quite large and thus unwieldy to make any sort of dent in a nickel iron asteroid. Traditional mechanical mining tools and heavy equipment with drill bits are much more common along with the strategic use of explosive charges and (where technology allows) plasma or fusion mining rigs. Tripod, vehicle or gantry mounted laser drills tend to be used only where their usage is deemed to be more effective than lower tech mining solutions e.g. when 'cutting ice' (mining cometary or Oort bodies for frozen water), enter the 'Ice Cutters'.

Laser Weaponry

Hand-held laser weaponry is popular for a different reason, starship and vehicle power plants can easily and quickly recharge them, making logistical tasks much easier, also when defending claims their long range and performance characteristic make them ideally suited to life in the vacuum.

Ice Cutters & Pushing Ops

Some beltlers become full time 'Cutters', moving icy bodies into positions near to the local mainworld or market (being mindful of the local sun and it's ablative strength). Water ice is a useful commodity for both off plant life support and starship fuel; a tidy profit can be made, towing, pushing or cutting ice in areas of extensive interstellar and interplanetary shipping activities.

Needless to say because of the terrible danger of free falling asteroids and Oort bodies being deliberately aimed at the mainworld by dissident groups, this type of traffic is always strictly controlled with special licences and permits for belter captains and incredibly high security amongst the 'tug' crews. Military vessels from the nearby mainworld's system defence forces or Navy will always be on the lookout for danger or suspicious shipping patterns. Deviating from a flight plan by just a small degree may be enough to draw unwelcome attention to any group of travellers in all but the most low value and thinly populated systems where this type of operation is unfolding.

Too many times in the history of chartered space have anti-establishment organisations, terrorist groups and rebellious/warring factions tried to eradicate their enemies by staging the 'accidental impact' of a cometary/asteroidal body on a populous mainworld. Thankfully not many of them have succeeded. The Imperium in particular consider such large 'mass driver' attacks to be an unscrupulous use of weapons of mass destruction and does not tolerate the unauthorised 'dead fall' of any fragment over a metre in length, irrespective of its composition and the likelihood of it burning up on the way down.

Moving any asteroid/planetoid or Oort object into a stable orbit near it's marketplace or mainworld is called 'Pushing' as in 'Pushing Ice' or 'Pushing Rocks'. Velocities are low, burn times are kept to a minimum and safety margins are huge, thus pushing operations are always long term with valuable commodities that typically take months or years to move safely to their destination especially if from out-system (usually defined as beyond the habitable zone away from the parent star). Higher speeds are off course possible but mean that reacting forces will have less time to correct any dangerous trajectories in the event of an emergency.

Tugs are immensely powerful vessels, with huge drives and long endurance power plants designed to apply fractional amounts of thrust over a very long period of time. As such these vessels can accelerate wildly and give anything a run for it's money when not pulling or pushing a load. Consequently many belter tugs wind up in the hands of criminals or those that fancy their chances when squaring up against the local police cutters and naval elements. Whilst not always the most nimble of vessels their high accelerations do suit them for a variety of blockade running operations. When pulling or pushing even the smallest rock

or ice chunks, tugs normally work in tandem with a few other tugs and pilot vessels, each of which can apply force to the asteroid via their attached cables in a different direction. This delicate operation will of course be overseen by a master fleet astrogator. In areas of low interplanetary traffic and minimal security threat, some larger bodies are simply marked with an automatic repeating beacon and set adrift in the direction of the intended destination. Several months later the object is simply met by the pushing crew and moored into position by the tug flotilla.

Free falling asteroid such as these are often inspected by Naval vessels or local system defence forces due to the fact that they can quite easily hide a powered down vessel from detection, making them excellent strategic locations for corsairs and privateers to attack merchant shipping from, particularly if they are icy bodies that can be used to provide an abundance of fuel for fusion reactors, plasma thrusters and jump drives.

Pushing ops usually involve attaching mobile, fuel tanks, power plants and thrusters to an asteroid with some rudimentary guidance systems that effectively turn the rocky body into a planetoid spacecraft under the remote or local control of a belting team. Mining operations may well continue on 'the rock' until it reaches its destination. The stockpiled ore is then simply shipped to its target world or a nearby orbital smelter. Pulling ops are as most commonly imagined as several tugs attached to the asteroid by heavy duty cables and rigs, deeply anchored into the surface of the 'roid'.

Pulling ops usually involve a minimum of 6 tugs attached to the asteroid, each one providing fractional amounts of thrust in one cardinal direction, such as forward, back, to the left/right and the local up/down as defined by the bodies mass, local g field (if any) and the fleet astrogator's expertise. Thus any such asteroid can be expertly controlled and acceleration can be provided in any direction by synchronising the thrust outputs of each ship in the flotilla. Likewise braking forces can be applied by any of the vessels at the rear simply accelerating away from the direction of travel. Whilst this can strain the cables, they are usually over engineered and more than up to the job, making cable breaks a comparative rarity. When they do break however the effects can be catastrophic for crew on the rock or in close proximity to it.

Ore Dropping

Some higher tech worlds are increasingly allowing the use of magnetic slings and dead fall drops to the surface of any ore required in bulk, though not naturally occurring within its own geology. In this case banks of grav repulsors are set up to brake the ore's descent and bring it safely to the ground. This is just another example of how military technologies have shaped the lives of the Imperium's citizens, most repulsors have an effective range of typically 50,000 km and can be built as large as required to match the ore drops. Nonetheless such installations are usually well way from population centres as drops are very tightly controlled from orbit for reasons mentioned elsewhere in this document. Sufficient braking means that ore can be dropped through an atmosphere without burning up, allowing it to hit the ground 'cold'. Such commodities however. must be immensely valuable to justify such expense and would most likely need to contain rare earth elements or some other substance of great value.

Sky Hooks

Whilst glamorously portrayed in the media, 'Sky Hooks' are not cost effective in today's economic climate, the immense cost of creating an orbiting station that is permanently connected to the ground by thousands of kilometres of hyper diamond filaments (carbon nano tubes or similar technologies) far outweigh the relatively trivial cost of breaking, smelting and shipping refined products in orbit or near planetary space. Where Sky Hooks exist they have usually been built by isolated cultures that have either never developed gravitic technologies (only adopting them in the wake of Imperial contact) or have been built for other reasons some of which may be aesthetic, practical or purely for the scientific/engineering value. It is interesting to note that the Sky Hooks found around the Imperium are nearly always relics from before the Ziru Sirkka or attempts to maintain orbital capability by worlds that experienced technological regression during the Long Night. The simple truth is that no matter how glamorous or technically possible a technology is, it will rarely be put to use unless it can ultimately pay for itself and preferably show a profit. As always exceptions exist such as the Divine Tower of Godly Ascendancy, a sky hook built by the religious government of Wesaswek (Empty Quarter 0229 – A8868DB-D 225 Im F5V)*, the traditionalist government of which firmly prohibits gravitic/reactionless transportation of all kinds, claiming that it usurps

the the laws of God as laid down at the universe's creation. Thus all traffic to and from the surface must go through the Sky Hook which allows this totalitarian government to levy great amounts of tax on traffic and freight whilst severely controlling access to and from space by combined Bwap/Vargr and Human citizenry. Aerodynamic, non reactionless vessels (which are increasingly rare), may of course use the atmosphere, though pay through the nose for the subsequent 'on ground support and refuelling'.

*Data is correct at the time of publication being the Imperial Year 990.

Asteroid Sizes

Whilst most observers use the terms 'asteroid' and 'planetoid' almost interchangeably some common definitions are as follows.

NSO (Near Space Objects)

Near space objects are any rock fragments larger than an atom though no bigger than 50 metres in diameter that happen to pass within planetary range (approx 50,000 km) of a given world. As such these objects are tracked by ground based or orbital sensor arrays and rarely warrant a visit by an inspection team unless they are likely to cross busy shipping channels. Most objects of this classification either pass by the nearby world on their way elsewhere or fall into stable orbits around the planet in question. Survey data containing the locations of these objects are continuously broadcast to ships entering and leaving the region minimising the risk of any collisions or traffic control problems. Sometimes contentious, these objects are great places for smugglers and blockade runners to operate from and as such are very closely watched, albeit at a distance.

Micrometeoroid 1 micrometer to 1 meter in diameter.

Any particle that is small in size and travelling at a high velocity relative to a ship, station or main world and such represents a danger of hull breach and other damage if collided with. Small merchant vessels have been practically destroyed by such impacts however rare they may in actuality be. Thus transits through belts or regions of high micrometeorite density must be handled carefully. Micrometeorite velocities are so high that they are rarely detected until the hull has been breached or they have safely passed the vessel or installation threatened by them. The best defence is a thick hull which is yet another reason why most better habitations are deep underground or otherwise sheltered from impacts. Most micrometeorites are harmless and tend to burn up high in the atmosphere of most standard pressure main worlds as 'shooting stars'.

Meteoroids 1 to 10 meters in diameter.

A larger class of object ranging in size between 1 and 10 meters in diameter and as such a larger class of threat than micrometeorites, thankfully they are easier to track however and positions tend to be well charted in busy systems. Where these objects are the greatest risk to shipping tends to be in the lower tech systems that do not have access to higher tech sensor arrays and survey equipment. Like micrometeorites they too tend to burn up in standard atmospheres and denser, though occasionally make it to the ground as meteorites. Both classes of object are only referred to as micrometeorite or meteorites if they enter a planet's atmosphere irrespective of whether they burn up (if there's an atmosphere) or hit the ground.

Asteroids 10 meters to 500 km

Any rocky body between 10 meters and 500 km in diameter is an asteroid as noted below they vary in composition and distances between each other and are otherwise unremarkable unless rare elements or radioactive materials can be detected and profitably excavated. Asteroids are seldom a risk to shipping as they are fairly easy to detect and with sufficient warning can be pushed away from busy shipping lanes by pushing crews.

Planetoid 500 km and above...

As the name suggests, planetoids are objects that are for all intents and purposes small planetary bodies and whilst they may be irregularly shaped (if small) or even spherical for larger bodies, their composition and classification is generally the same as an asteroid body. Large planetoids or Oort objects may even attract thin atmospheres and be more like independent worlds or moons if orbiting a larger world.

Asteroid Separation

Whilst asteroids and planetoid bodies are frequently portrayed in the media as being small chunks of rock very close together such as a mere 1 or 2 meters apart, the reality is quite different. Asteroids orbiting a typical G2V star in Orbit 5 in a circular belt can average a staggering 1.5 million kilometres separation from each other. Thus prospecting trips to individual rocks can take a long time and often be fruitless, hence the need for up to date and accurate survey data when prospecting.

Planetoid Belts/Ring Systems

Where the media imagery is more likely to be true is in ring systems often (incorrectly termed planetoid belts) that form around larger worlds, most typically gas giants. Where these belts are nickel iron rich (rare) or survey data seems to suggest other valuable elements these ring systems can be incredibly profitable for the averaging belting crew or mining conglomerate.

Whilst most of the smaller particles are likely to be worthless dust, small rocks and boulder sized pieces, logistically ring systems are a dream to mine as larger planetoid's (often Shepherd Moons) make ideal bases of operation from which to prospect the belt (even if they are not being mined themselves). Whilst it is common for most belt objects to be tiny some of the larger fragments can reach one or two hundred tons of displacement and are well worth the effort of mining. Furthermore the risk of micrometeorite damage can be greatly reduced as it is fairly easy to synchronise a mining ship's velocity with the average velocity of the ring system. So conversely the presence of more smaller particles can represent less of a danger to a mining crew as their impact energy can be made correspondingly smaller. Also rings range in thickness but are typically about 1.5 meters thick in areas of low density around larger gas giants, so avoiding the ring and hence the likelihood of impact is exceptionally easy. It's a rare ring system however that can produce great riches as most bodies fall into the carbonaceous chondrite (read 'low value') category with the occasional silicate thrown in for good measure, the remaining particles are typically cometary dust or ice fragments. Ring prospecting is most often undertaken if there are no suitable mainworlds in the system from which to take, silicates, water and hydrocarbons from.

Asteroid and Planetoid Belt Conventions

In terms of Imperial convention, asteroid belts are those planetoid belts that are deemed to be the system's 'mainworld' by cartographers and scout surveyors alike. To a geologist or prospecting belter there is no difference in likely belt compositions or value, it's all rock.

Asteroid Types

Anyone can point their sensor array at an asteroid or planetoid belt and in the right market eke out a living mining whatever they can find, but it takes a skilled belter to sort the chaff from the wheat and find a site worth prospecting. Given that in a typical inner system asteroid belt, larger rocky bodies can be separated by 1.5 million kilometres or more makes visiting and sampling each one a time consuming and costly option. Survey data can help as asteroids tend to fall into several known categories.

Carbonaceous Planetoids:

Mainly composed of carbon compounds (like tar), chiefly carbon, hydrogen and oxygen, can be used to make oil, synthetics and even some foodstuffs and water, thus they may have value in some systems without habitable mainworlds. Most commonly dark brown to dull black in colour.

Nickel Iron Planetoids (S & M Type):

As the name suggests they contain a high quantity of nickel-iron and as such are sources of metal. This type of asteroid frequently contain deposits of valuable dense metals or radioactives. Unsurprisingly they are the most valuable form of asteroid and are typically a medium grey in colour. S type asteroids tend to be composed of metallic nickel-iron mixed with iron and magnesium silicates. M types are almost always pure nickel-iron

Stony Planetoids:

The most commonly encountered planetoids, essentially just large free floating rocks, usually made up of silicon compounds, as such there is rarely any market for this type of asteroid. They are usually light grey or tan in colour.

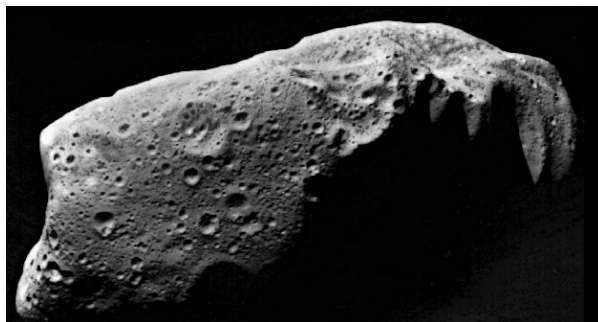
Icy Planetoids:

Dirty ice balls of frozen water, ammonia and methane, usually of value as a source of hydrogen fuel, particularly in systems where gas giant refuelling cannot take place. They have a full range of colours from bright white to dull black depending upon the specific chemistry and impurities found within the asteroid.

Asteroid formations

Rubble Piles:

A rubble pile is an informal name for an asteroid that is not a single body (monolith) but instead consists of numerous pieces of rock that have coalesced under the influence of gravity. These asteroids can have an essentially random composition and typically have low densities because there are large cavities between the various rock segments that comprise them. Strip mining is the preferred method of mineral extraction from such rubble piles. Most rubble piles are the result of a former monolithic asteroid having been smashed to fragments by an impact. Such coalescing when it has been observed has taken anything from several hours to weeks or years to occur, on examination, some asteroids can clearly be seen to be riven with cracks, irregularities and protrusions despite being otherwise solid, a sure indication that they are rubble piles. A prospecting ship's densitometer will soon confirm whether this is the case.



Contact Binaries:

Occur when two large asteroids touch with or without rubble filling the boundary, large interior voids are possible due to the very low gravity of such asteroids. Over time they tend to build up a fine regolith (crust) on the outside, friction between the fragments dominates and thus prevents smaller chunks from falling inwards and filling up the cavities. Contact Binaries are thus very easy to mine, though not without hazards such as dust pools. It should be noted that in classical (imperial) Astronomy some Binary Stars that are close enough together to share a common gaseous envelope are also called Contact Binaries, as each star's corona (or in some cases their surfaces) will touch and merge with the corona of its neighbour. These star types are more usually referred to as Eclipsing Contact Binaries.

Monoliths:

As the name suggests, monolithic asteroids are those bodies not made up of separate component rocks, being large enough to survive many impacts intact, the largest such monoliths have impact craters scattered across their stony surfaces (as they are usually S-type) and fine powdery regoliths generated over millions of years of sustained bombardment.

Belt Regions:

Asteroid belts tend to gravitate into three distinct zones, the N-zone (full of nickel-iron and stony planetoids), the M-zone (a transitional area of proportions of nickel-iron and carbonaceous asteroids

shift from the concentrations of the N-zone to those of the C-zone (an outer zone containing mostly stony and carbonaceous asteroids. Icy planetoids can also be found here if present).

Ring Systems:

A ring system is a planetoid belt that orbits a planet as opposed to a star, ring systems are predominately one planetoid type either nickel-iron (very rare), stony, carbonaceous or icy.

Mining Techniques

Strip mining is the practice of mining a mineral seam by first removing a long strip of overlying regolith (traditionally called 'the overburden') exposing the near surface minerals beneath. Most frequently practised on large asteroidal bodies most of which are rubble piles with the aid of gigantic machines such as Bucket Wheel Excavators . These vacuum hardened and fully pressurised behemoths are the direct descendants of Bucket Wheel Excavators used in traditional planet based mining, though tend to be modular allowing them to be easily and quickly segmented into smaller sections and components to allow ease of transportation and deployment. Where there's a BWE, there's almost certainly a nearby ore ship or semi-permanent belting camp within close proximity. BWE's typically can move up to 12,000 cubic meters of regolith/minerals per hour.



A Bucket Wheel Excavator (BWE) in deployment on an airless moon in the Rajan system (Empty Quarter 2331 A362875-9 Ri 100 Im G8 V) as per the Imperial Year 990

Area Stripping:

Where asteroids are large and have fairly flat surfaces, a more common method is area stripping, which is ideal to extract deposits from a large area. Long strips are excavated and the removed rubble/regolith is placed in the furrow produced by the previous strip. This method is neat and efficient.

Contour Stripping:

In direct comparison Contour stripping involves removing the overburden/regolith above a known mineral seam near a given outcrop where there is hilly/rough terrain on a larger planetoid's surface. This is best used where the mineral outcrop follows the contour of the

'terrain' and is distinctive as hilly projections on an asteroids surface soon become stepped terraces. This is often followed by Augur Mining into the deposit allowing more of the mineral to be removed.

Augur Mining:

Traditional bore hole based mining in which a rotary drill creates holes, usually called boreholes and/or shafts in the crust. Drilling rigs can be massive structures housing equipment used to drill almost any type of substance from a planet's surface, more typically water, oil, natural gas etc. When used in vacuum they can create shafts into the very heart of an asteroid ready for nuclear flash heating or simply to create a tunnel large enough to send crew and equipment through whilst removing valuable minerals at the same

time. Small drilling rigs can be moved manually by a single person and can be used to explore the sub-surface regolith, remove samples from prospective mining sites and thus assist with the profitability analysis of the visited asteroid. Intermediate rigs can be mounted on sub-craft or larger enclosed air/rafts. The very largest rigs are often found on some airless moon's surface abandoned after a high value mineral has been completely mined out. Indeed some are thousands of years old (though non functional as key components will have been removed by the owning corporation or lucky passers by in the many years since their last shut down). When activated however they are more than capable of drilling thousands of kilometres into the crust. It's simply staggering when you consider the vacuum cities built both below and above the crust that started out as a single though profitable drill site.

Outcrop Removal Mining (OTR):

Outcrop removal mining is a form of mineral extraction that involves the mass restructuring of crust/regolith in order to reach a mineral seam that may be as deep as 300 metres below the surface. It is used where a mineral deposit outcrops all of the way around a exposed hill or 'mountainous' region on an asteroid or planetoid's surface. All of the removed crust are placed in adjacent lowland areas such as hollows, impact craters or crevasses . Outcrop removal replaces previously steep topography with a relatively level surface.

Blasting expels great volumes of dust and rock into low, shallow orbits around the asteroid (some particles easily achieve escape velocity, making the area dangerous for spacecraft for a short time), this fine dust tends to settle on everything (albeit slowly due to the weak gravitational fields of most asteroids) covering equipment, personnel and tools in a micro-fine layer of silt that can be problematic to some mechanical equipment.

Highwall Mining:

Highwall mining is another form of surface mining that evolved from auger mining. In highwall mining, the ore deposit is penetrated by a continuous mining machine that has three distinct components, a cutterhead, a hydraulic Pushbeam Transfer Mechanism (PTM) and a powerhead that generates the motive force required to cut into the surface.

Instead of drilling an auger hole, an entry into the deposit is made by a continuous miner, remotely operated from a pressurised cabin at the surface. The cut resource is transported by conveyors behind the miner to the outside. Using 2d or holographic display the operator can see and control the miner's progress.

A typical cycle includes sumping (pushing forward) and shearing (raising or lowering the miner's cutterhead boom to cut the entire height of the mineral resource). As the operation continues, the cutterhead is progressively pushed into the regolith/crust for 10 meters. At this point the drilling rig's Pushbeam Transfer Mechanism (PTM) automatically inserts a 10-meter long rectangular pushbeam into the centre section of the machine between the powerhead and the cutterhead.

Some highwall mining systems use augers enclosed inside the pushbeams that prevent the mined ore from being contaminated by rock debris during the conveyance process. Highwall mining can produce thousands of tons of clean ore in contour-strip operations with narrow benches, previously mined areas, or trench mine applications.

Recovery is much better than augering, but the mapping of areas that have been developed by a highwall miner are not mapped as rigorously as deep mined areas. Very little spoil is displaced in contrast with outcrop removal mining, however a lot of capital is required to operate & own a highwall miner, making such purchases well beyond the reach of small independent belting clans, families or corporations.

Mapping of the outcrop as well as data derived from core holes & samples taken during the survey process are taken into account to best project the panels that the Highwall miner will cut.

The use of highwall mining systems is most common in mines where overburden depth exceeds economical recovery. Highwall stability is a major concern during highwall mining.

Surface mining creates problems for the human health, whilst gases, dust in suspension and noises are scarcely a concern in vacuum operations, vibrations from the machines and explosions are another matter and have been known to cause damage to some biological nervous systems, making the use of

vibration shielded quarters the norm, along with remote operated vehicles and robots on many a mining site.

Open-pit mining, also known as **opencast mining** and **open-cut mining**, refers to a method of extracting rock or minerals from the earth by their removal from an open pit or borrow. The term is used to differentiate this form of extraction from other methods that require tunnelling into the earth. Open-pit mines are used when deposits of commercially useful minerals or rock are found near the surface; that is, where the *overburden* (surface material covering the valuable deposit) is relatively thin or the material of interest is structurally unsuitable for tunnelling (as would be the case for many rubble piles) or binary contact sites. For minerals that occur deep below the surface where the overburden is thick or the mineral occurs as veins in hard rock more traditional underground mining methods are best used to extract the valued material. Open-pit mines that produce materials useful for building new structures are by tradition known as quarries.

Open-cut mines are typically enlarged until either the minerals are completely exhausted, or an increasing ratio of overburden to ore makes further mining uneconomic. When this occurs the mine is simply abandoned.

Open Cut mines are dug on benches, which describe vertical levels of the hole. These benches are usually on four meter to sixty meter intervals, depending on the size of the machinery that is being used. Many quarries do not use benches, as they are usually shallow.

Most walls of the pit are generally dug on an angle less than vertical, to prevent and minimise damage and danger from rock falls. This depends on how weak the overburden is and it's exact geological make-up, as even in the ultra weak gravity of a small planetoid, rock falls can still happen. The inclined section of the wall is known as the batter, and the flat part of the step is known as the bench or berm. The steps in the walls help prevent rock falls continuing down the entire face of the wall. In some instances additional ground support is required and rock bolts, cable bolts and plastocrete are used.

A haul road is situated at the side of the pit, forming a ramp up which mobile excavators can drive (if wheeled or tracked) carrying ore.

Waste rock is piled up at the surface, near the edge of the open cut. This is known as the waste dump. The waste dump is also tiered and stepped to maintain safety.

Mining Drones

Are small robotic explorers designed to fit within and be launched from a vessel's cargo hold, as such these state of the art tools have sophisticated sensor arrays, combining small scale passive ems abilities (thermal imaging, radiation detection and similar) along with the combined use of densitometers and laser range finders, allowing easy estimation of local mineral deposits composition and amounts, not to mention ease of extraction.

Best suited to smaller scale asteroids or rubble piles, these robotic miners, use micro thrusters to manoeuvre into position and settle on to an asteroid's surface. The fully mobile drones then use tracks, claws, clamps, legs or screws to move about the asteroid surface (depending on local conditions) to position themselves in the ideal extraction spot before automated mining operations begin.

When mining commences they can use any of the mining techniques previously mentioned (as limited by their exact design) including auger mining as most drones have drilling equipment built in.

Most preferable however are long term assignments in which outcrop removal and open cut/strip mining go on. In which case the semi-intelligent drones are overseen by the prospecting crew responsible for their maintenance and repair as drills, plasma torches and other components can frequently breakdown.

Mining drones are expensive though worth their weight in gold, though some more traditional (some would say lower tech) miners consider them to be the toys of playboys and asteroid prospectors who simply 'play at being miners'. Nevertheless such play can be immensely profitable if done properly.

Belter Dress

Mining in hard vacuum has always been a risky proposition for even the most experienced belter. Standard vacc suits tear far too easily and even with self sealing options or additional hardening with extra layers such as a thermal micrometeoroid garment can be punctured all too often when working any given mining site. Just like a rifle bullet a high speed fragment of rock, thrown out by a mining machine such as an ore processor, mining drone or an ultra-fast drilling system can easily puncture all but the most rugged of Vacc Suits with disastrous consequences for the occupant. Combine these industrial hazards with the high speed rock fragments that tear away into space in the wake of an explosive detonation from charges, fusion guns or shipboard lasers (all commonly used in mining operations) then the need for an armoured Vacc-Suit becomes exceptionally clear.

Belter dress is heavy, armour plated and similar in nature to military/paramilitary issue combat armour in terms of the protection it provides. It's similarity with the super slick and extremely well crafted combat armour ends there as in function Belter dress is nothing more than a cleverly designed heavy duty vacc suit with external mounting points for additional armour and a detachable exoskeleton, making the suit more similar to a hostile environment vacc suit (HEV) in terms of appearance and encumbrance though again without the pressure support and the ability to operate for long periods in insidious atmospheres that HEV's tend to have as standard.

Each suit comes with a combined PLSS (Portable Life Support System)/LRTP (Long Range Thruster Pack) mounted just below the PLSS, which in humans is at the back. This small pack will provide 1200 seconds of thrust (20 min's) at 0.1G acceleration and can heat any safe liquid fuel such as liquid hydrogen or any noble gas to produce thrust. Slight modification of the unit will allow it to heat water to plasma state and use that for thrust if this is considered more convenient. As tiny bursts of 1-2 seconds are most commonly used to orientate the belter and allow Extra Vehicular Activities (EVA) and motive force, a burn time of 20 minutes is more than sufficient for any 8 hour work shift. Additional higher cost options can extend this to up to 48 hours burn time if needed.

In the Tech 11 version of the suit Oxygen is supplied by 3 specially crafted ultra high pressure bottles, fitted within the PLSS unit. Each bottle will allow the occupant the luxury of clean, fresh air for 8 hours, all 3 will support him or her for a maximum of 24 hours. Most mining shifts swap rotations after 8 hours, the additional time is provided purely for emergency usage. At Tech level 13 a re-breather system can be included at additional cost which will recycle breathable air and water indefinitely, this adds some additional bulk to the suit so is not a popular option.

Belter dress has an externally mounted fully detachable exoskeleton to assist with lifting heavy rock fragments. Should the exoskeleton fail the suit will be temporarily heavier and more difficult to manage until the exoskeleton is removed (a simple process that can be done manually by the suit user in under 2 minutes using the large bulky release levers on the main joints of the skeleton/suit interface which runs parallel to the spine in humans and attaches at the several points on the suit spine, the shoulders and waist, knees, ankles, elbows and wrists). Protection from high speed fragments is provided by thin (changeable) shaped crystaliron sheets mounted on the chest, legs and arms with heavy boots and crystaliron/ballistic cloth gauntlets for the hands allowing them to be tough and flexible. This counts as rigid armour, for the chest, abdomen and head (see helmet description below) beneath this layer is a standard self sealing heavy duty vacc suit. Unlike battledress the exoskeleton is not a permanent part of the suit for reasons of reliability and safety should the device fail. The suit is topped off with a hard helmet with a light sensitive face plate and a shaped visor of solid crystaliron that can be lowered to cover the face plate when dangerous activities are commencing, thus protecting the face plate from smaller flying fragments. The visor mounts delicate optical sensors as part of a highly sophisticated passive ems array.

The helmet has feeds to external optical/passive ems sensors mounted on the helmet and are equivalent to a set of priss binoculars in terms of detail, resolution and application. When the visor is lowered cutting off the view from outside, a set of 2 optics move into position (one before each eye) giving the user a 3d view of the outside as seen from the suit cameras/passive sensors in addition to any technical information generated by the suit and any subsidiary equipment plugged into it. When the visor is raised the optics retract (for additional comfort) and essential information is projected directly onto the face plate instead in a handy heads up display. The optics are sensitive to movement of the user's head and move with it, adjusting the optical feed as they do so, giving as realistic a view as possible of conditions and objects outside of the suit.

Whilst most versions of the suit can be worn by anyone, special care is required to fully adjust the position of the helmet mounted optical camera's on the visor to closely match the user's eye positions. Failure to do so can lead to confusion and a period of minor adjustment if multiple people attempt to use the Helmet without adjustment.

Most belters therefore set up their own helmet they way the like it best and keep them for their own use if suits are in short supply.

It is true that the visor mounted sensors are themselves vulnerable to impact from fragments, but this is considered a minor inconvenience as the visor can be raised when the danger has passed allowing normal vision to resume.

Other features include as standard are tourniquets on each limb allowing blood flow to be restricted to damaged body parts, as well as a set of intravenous injections ready to be deployed at the touch of a button (usually injected through the forearm and chest). Shots include adrenaline, pain killers, stimulants and even medical fast drugs to make the most of any meagre resources such as oxygen and water and of course antidotes to such drugs. Suits come with a short range 3 Km radio communicator as standard and suit comm scrambling software to protect the privacy of the occupant's communications which can integrate directly with an ear mounted or implanted aide (see the T4 Rule book page 65 for a full description of this device). In emergency circumstances the communicator can be used to broadcast a distress code.

TL	Component	AV	DEX	Mass	Vol	Cr	Notes
11	Belter Dress	3	-2	6 kg	3.6 m3	7,000	Under Suit
11	Crystaliron Plating	+2	-2	4 kg	0.5 m3	2,500	Outer skin
11	Exoskeleton	---	-1	10 kg	1.0 m3	14,000	+4 STR
11	PLSS/LRTP*1	---	---	30 kg	55 liters	8,000	Dur 24 Hours
11	Oxytank	---	---	6 kg	10 liters	3,250	Dur 8 Hours
11	Helmet	6*	---			17,000	
13	Belter Dress	3	-1	4 kg	3.3 m3	9,000	Under Suit
13	Superdense Plates	+2	-1	2 kg	0.5 m3	3,000	Outer Skin
13	Exoskeleton	---	---	7 kg	1.0 m3	17,000	+4 STR
13	PLSS/LRTP*2	---	---	30 kg	55 liters	11,000	Dur Unlimited
13	Recycler	---	---	15kg	20 liters	22,000	Dur Unlimited

All totals are cumulative, eg. A basic belter dress suit worn without the crystaliron plating at Tech 11 has a dex penalty of -2 and provides an armour value of 3, attaching the crystaliron body plates will see that protection raise to 5 (+2) and dex be penalised by a further -2 for a total of -4 to dex. Adding the exoskeleton will also add an additional penalty of -1 to dex but increase STR by +4. Higher tech options mitigate this somewhat.

*1 this pack provides life support for up to 24 hours and 0.1G thrust for 20 mins

*2 this pack provides life support for up to 48 hours before needing to have it's fuel cells recharged or replaced. Life support such as oxygen and drinkable water can be recycled by the suit for an effectively unlimited amount of time. Though the filter mechanisms should be serviced at least once a year to maintain suit reliability. As suits actively used by belters rarely last that long this is scarcely a concern.

Armour Values (AV) are given as a general all over body rating, if additional information for specific body parts is needed see below.

Suit	Head	Chest	Abdomen	Arms/Legs	Hands/Joints etc
Belter Dress	6	5	5	5	3

Helmet Rigid Armour Rating 6

Assumes fully fitted Belter Dress Suit.

Classic Traveller Integration

Belter Dress Treat as Cloth Armour
 With crystaliron Plating Treat as Combat Armour

Belter Assignments

Belt Miner

Whilst prospectors might get all of the glamour, someone needs to dig the really big deposits out of the rock, that's what Belt Miners do, they excavate and move on once the ore is exhausted. Famous for working hard and playing equally as hard, a belt miner's life is one of high stress, high danger and camaraderie. Belt Miner's literally trust each other with their lives, friendship is important to a miner. If you want to be friends with a Belt Miner, then you've got to earn it.

Belt Citizen

An ordinary citizen of a belt community, not everybody cuts ice, drills rock or gets out there to prospect. Someone's got to do the really hard work of maintaining a community to welcome the miners back too. As such belt citizens are the teacher's lawyers, administrators, ore traders, life support technicians and engineers that take a back seat and are seldom thought of as 'Belters' by the greater universe. Without them there would be no settlements to call home.

Belt Prospector

Some say that prospectors are rich kids playing at mining with their seekers and drones, others say their corporate scouts, exploring, never seen before 'rocks' marking claims and moving on. Prospectors say that they're free spirits that can't be contained by any vacuum colony or permanent belt mining op.

Salvager

Space travel is far from safe, natural accidents and the belligerent ill wishes of other beings can send your soul screaming into the dark. Whilst lives cannot be recovered equipment can be used again as intended, especially ships, wreckage must be investigated, equipment and logs recovered, bodies sent home and closure granted to the grieving. The universe can't keep a secret and Salvagers are the people who uncover them first.

Wildcatters

It's not just rocks that need mining, but gas-giants too, Wildcatters are the people that keep civilisation supplied with liquid hydrogen fuel and other gaseous compounds skimmed from the upper layers of gas-giants, or mined from the Hydrocarbon Seas of exotic worlds thought of as chemical hells by most sane citizens, but a veritable treasure trove of cash to a skilled wildcatter.

Belters a "New" Career Path for Marc Miller's Traveller T4

Enlistment	6-	DM+1 if STR 7+; DM+2 if INT 6+
Injury	5-	DM+1 if DEX 7+;
Commission	--	Belters do not have any organised rank/promotional structure.
Promotion	--	
Continuance	8-	

Minimum Tech Code Early Stellar+ (TL9+)

Skill eligibility 1 per year (4 skills per 4 year term)

1. Physical

1	+1 STR
2	+1 DEX
3	+1 END
4	Vacc Suit
5	Brawling
6	Short Blade

2. Mental

1	+1 Int
2	+1 Edu
3	Technical
4	Geology
5	Grav Craft
6	Spacecraft

3. Educational

1	Academic
2	Medical
3	Technical
4	Spacecraft
5	Exploration
6	Gunnery

4. Social

1	Business
2	Charisma
3	Technical
4	Gun Combat
5	Clandestine
6	Bureaucracy

5. Career

1	Technical
2	Sciences
3	Business
4	Gunnery
5	Jack of all Trades
6	Academic

6. Background

1	Ground Craft
2	Melee Combat
3	Vacc Suit
4	Athletics
5	Performance
6	Grav Craft

Belters are rugged individuals, capable of living of the land and independent survival in the hazardous environments of deep space.

Naturally self reliant a Belter can fulfil many different roles from mechanic to miner or prospector and will be as comfortable in their ship's drive room as on the bridge or working the mineral face on an asteroid or planetoid moon.

Belters usually have a good mix of survival and technical skills and are an asset to any exploration mission.

Categories highlighted in **bold** represent skill cascades or clusters, choose an appropriate skill from each cascade or cluster as desired.

Rank and Service Skills

Skill Eligibility

All	1 st Term	Vacc Suit-1*	1 per year
	3 rd Term	Geology-1	
			Mustering Out Tables (1 Roll per 4 year term)
			Die Roll Cash Benefits Table
			1 -- Low Passage
			2 -- +1 Soc
			3 1,000 Weapon
			4 10,000 High Passage
			5 100,000 TAS Membership
			6 100,000 Seeker
			7 100,000 Seeker

No more than 3 rolls on the cash table can be taken.

*Jack of all trades skill may be taken in place of Vacc Suit Should the Character already have this skill

Meteor Burst Communication

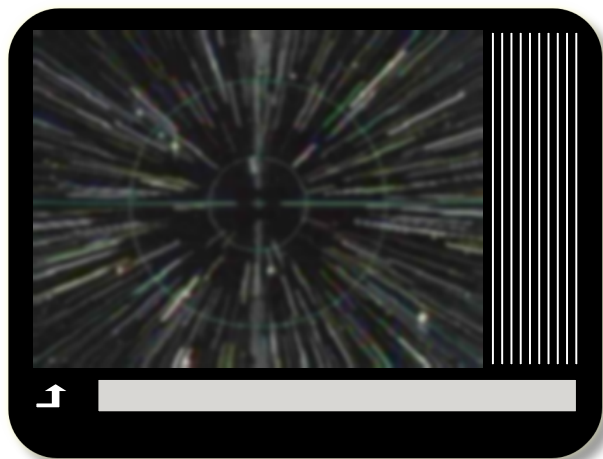
Or MBC for short, is a radio propagation mode that exploits the ionized trails of meteors during atmospheric entry to establish brief communications paths between radio stations up to 2250 kilometres apart. It is also referred to as meteor scatter communications in some Imperial documents.

As a planet with a suitably dense atmosphere (code 1+) moves along its orbital path, tens of thousands of particles known as meteors/micrometeors respectively enter the upper atmosphere. As these objects begin to burn up, they create a trail of ionized particles that can persist for up to several seconds. The ionization trails can be very dense and as such make almost perfect radio reflectors. The frequencies that can be reflected by any particular ion trail are determined by the intensity of the ionization created by the meteor, often a function of the initial size of the particle, and are generally between 20 MHz and 500 MHz.. The distance over which communications can be established is determined by the altitude at which the ionization is created, the location over the surface of the planet where the meteor is falling, the angle of entry into the atmosphere, and the relative locations of the stations attempting to establish communications. Because these ionization trails only exist for fractions of a second to as long as a few seconds in duration, they create only brief windows of opportunity for communications. Thus voice or video communications are often worthless, however short bursts of coded data such as field reports or survey details can easily be sent using this method.

Why is this important?

Quite simply because it allows separate groups of planet bound miners to communicate with each other without the need of expensive comm satellites or orbital support, making the use of this technique attractive to prospectors or small survey teams or even military forces indigenous to low tech worlds. Also it should be noted that satellites are not always as useful as popularly considered, especially at high latitudes or where the security of the signal is an issue. Indeed in areas where a comsat may only pass overhead once a day or be permanently stationed in a geosynchronous orbit over another part of the planet in question MBC is especially valuable.

Some comms specialists become experts in Advanced Meteor Burst Communications Systems (AMBCS), making use of phase-steerable transceivers that are directed at the correct area of the sky for any given time of day in the direction of the planet's rotation, thus improving data rates by using backscattered signals to pinpoint the exact location of the ion trail and direct the transceiver's antenna accordingly, sometimes making use of multiple trails at the same time.



Sandcasters

It should be noted that the highly reflective and ablative particles as found in sandcaster rounds also make for exceptionally good micrometeorites. Thus a sandcaster can also be used to create the conditions necessary to allow Meteor Burst Communications to take place, although why anyone would want to do something this obvious and unnecessary remains a mystery as a functioning communicator or repeater array will more often than not be found aboard the same vessel. Stealth is one possible explanation, most governments with sufficient technology can detect sandcaster fire in orbit, though an 'accidental blast' that allows communications to take place between two ground based strike teams may be useful.

Characters and MBC

It goes without saying that for player characters to make use of meteor burst communications, a high degree of organisation is required.

Thankfully meteor showers are predictable, especially with space craft in orbit monitoring movements of known meteor swarms and free floating debris.

An innovative Belter could easily make sure that the right conditions for MBC communications are available by pulverising a decent sized rock to dust and sending the resultant particles on their way towards the target world. As average mass and velocity of the objects are known along with other factors such as the distance to and local gravitational strength of the world in question will also be available a simple astrogation program will be able to supply the mining crew with the necessary speed, size and length of the debris cloud to make best use of this natural boon to ground based survey teams, along with other data such as where to send them, at what time to begin their journey as well as where they will eventually end up.

The IOP Design System



"It is the express wish of his majesty Emperor Cleon Zhunastu that shipbuilding be standardised across the many worlds of the Third Imperium and as such encourage imperial industries to work and trade with one another in both the manufacture of vessels and their constituent parts.

"It is envisaged that ship building will play an ever increasing role in the economic development of the empire. Thus it is his majesty's will that member worlds of the Third Imperium build their vessels to a common standard of excellence and sustainability allowing differing degrees of maintenance and supply on member worlds as per their local capabilities.

"To meet the wishes of our beloved Emperor we propose a standardised construction system that will make use of the capabilities of the many member worlds of the Imperium, by allowing those worlds that cannot yet produce their own vessels to begin supplying components and facilities for nearby worlds that do. Thus shipbuilding will become one of the economic cornerstones of Imperial life by building the very vessels that are needed to bring prosperity to the diverse worlds of the empire.

"Completed designs will be available in electronic blueprint media to all member worlds enabling them to be built across the empire to the same specifications and standards everywhere. This standardisation of construction will also see these vessels being manufactured at lower costs due to the use made of mass produced components. Existing shipyards that have served both the Imperium and it's glorious predecessor The Sylean Federation will also be encouraged to work within this new framework and seize the many financial benefits of joining the Emperor in his vision that shipbuilding be standardised. Those shipyards are of course free to continue manufacturing custom designed vessels of non standard construction as they have loyally done, for in many cases centuries."

It is also envisaged that as technology improves, climbing ever upward over time that the advantages of new developments will also be standardised so that our Imperium as a whole will continue to design and manufacture excellent ships for both trade and defence...

Lord Jhelman Arvikkishki of Titishi in an Address to the Moot Circa the Imperial Year Zero

Imperial Minister for Economic Development Circa Holiday Year Zero.

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Certain situations in Traveller call for a different ship design than those provided. The IDP Design System is a simple way of customizing and designing starships for Traveller. Ships designed with the QSD System are modular starships, assembled at the shipyard from standardized components similar in nature to those built under the existing quick ship design and standard design system rules.

The use of standardized components, and thus the economies of scale production, make starships constructed using this system cheaper than custom designed ships. Starships designed using the IDP (Imperial Data Package) System receive a 20% discount over the equivalent custom-built ship. The design tables below show the Un-discounted list price of the components. When the ship design is completed, multiply all the final cost by 80% to reflect the discount for standardized, modular construction. Future expansions to this system will allow the custom design of vehicles and robots and more.

THE DESIGN SEQUENCE

The goal of the design sequence is to fill in the Universal Ship Description of the new ship. This will provide all of the necessary details of the ship, from its cargo capacity to its fighting weaponry and



The design of the starship is a simple process of following the sequence below. When the Universal Ship Descriptor is completed, then the ship has been completely designed. Once the hull has been chosen, the total volume (in displacement tons) of the vessel will be known. All systems must fit in the volume of the ship hull chosen. Unlike other systems, surface area and mass are not factored into this design system for reasons of minimising complexity.

Rules follow to estimate the empty/clean and loaded mass of the finished design which will be close enough for game purposes. Surface area requirements are now simulated by components requiring a minimum hull size to be mounted such as sensors and electronics. Thus all the designer needs to worry about are the cost, volume and power requirements of any item fitted within the craft. The most critical of which will invariably be volume.

- Step 1 - Select Mission
- Step 2 - Select Hull
- Step 3 - Determine Hull Thickness
- Step 4 - Determine Length and Material Volume from Hull Size
- Step 5 - Modify length and Mvd by Configuration Type
- Step 6 - Multiply the Total Mvd by the hull thickness...
- Step 7 - Determine the cost of the Hull
- Step 8 - Streamlining
- Step 9 - Optional Features Airlocks and Fuel Scoops

- Step 10 - Select Jump Drive
- Step 11 - Select Manoeuvre Drive
- Step 12 - Select Lifters
- Step 13 - Command, Control & Avionics
- Step 14 - Armaments
- Step 15 - Defences
- Step 16 - Utility Features
- Step 17 - Life Support & Artificial Gravity
- Step 18 - Power Plants
- Step 19 - Crew Requirements & Accommodation
- Step 20 - Calculate Cost

Complete the USD

Step 1 - MISSION SELECTION AND TECH LEVEL

Select the Tech Level and mission for the ship. This will determine what sort of equipment will be needed. For example, a long range military ship will require a bigger hull and greater jump drives, not to mention weapons, whereas an intrasystem cargo vessel may only require a short jump drive, lots of cargo space, and no weapons. The requirements for weapons, defences, passengers and cargo will be dictated by the ship's mission.

Step 2 - SELECT A HULL

All vessels must have a hull; select one from the table below. Hull size is measured in Standard Displacement Tons (Std or simply tons), equal to 14 cubic meters, the volume of one metric ton (1000kg) of liquid hydrogen.

Step 2.1 - Determine Armour Value

Depending on the vessel's desired performance a minimum amount of hull structure and hence (increasing levels of armour) will be required, a vessel can of course have any armour value desired to make it tougher if desired, e.g. A reserve battleship might have an armour value of 100 or over (on the personal scale) with an engine performance of only 2G.

Min AV 1G	= 10
2G	= 20
3G	= 30
4G	= 40
5G	= 50
6G	= 60 etc

E.g a vessel that will need to travel at 4G will need a minimum armour value of 40. All values given are on the personal combat (not starship combat scale) rules follow to determine starship combat armour values later.

Hull Characteristics

Dtons	Length	Mvd
1	3.2	0.02
2	4.0	0.03
3	4.6	0.04
4	5.2	0.06
5	5.6	0.07
6	5.8	0.09
7	6.2	0.10
8	6.6	0.11
9	6.8	0.12
10	7.0	0.13
15	7.5	0.15
20	8.0	0.16
25	8.6	0.17
30	9.2	0.19
40	10.4	0.20
45	10.8	0.24
50	11.2	0.27
55	11.4	0.28
60	11.6	0.30
65	12.1	0.31
70	12.5	0.32
75	12.9	0.34
80	13.2	0.36
85	13.4	0.37
90	13.6	0.39
95	13.8	0.41
100	14.0	0.42
200	17.0	0.64
300	20.0	0.85
400	22.0	1.07
500	24.0	1.21
600	25.0	1.42
700	27.0	1.57
800	28.0	1.71
900	29.0	1.85
1000	30.0	2.00
2000	36.0	3.07
3000	42.0	4.07
4000	47.0	5.00
5000	51.0	5.71
6000	53.0	6.42
7000	57.0	7.14
8000	60.0	7.85
9000	62.0	8.57
10,000	64.0	9.28
20,000	80.0	14.28
30,000	92.0	18.57
40,000	104.0	22.85
50,000	112.0	26.42
60,000	116.0	30.00
70,000	125.0	33.57
80,000	132.0	36.42
90,000	136.0	39.28
100,000	140.0	42.14
200,000	170.0	67.14
300,000	200.0	87.14
400,000	220.0	106.07
500,000	240.0	123.57
600,000	250.0	139.28
700,000	270.0	154.28
800,000	280.0	168.57
900,000	290.0	182.14
1,000,000	300.0	195.71

Step 3 - Determine Hull Thickness

Hull thickness will depend on the toughness of the available materials simply divide the desired armour value by the actual armour value of the desired materials.

E.g. We need an armour value of 40 and plan to use bonded superdense hull materials (available at tech 14) Bonded Superdense has an Armour Value of 28 so we divide 40 by 28 to get a hull thickness of 1.42 cm.

Hull Shell Armour Values and Costs per displacement ton of materials.

TL	Armour	Material Type	Cost (Mcr)
TL8	AV 6	Composite Laminate	0.112
TL10	AV 8	Crystal-Iron	0.126
TL12	AV 14	Superdense	0.196
TL14	AV 28	Bonded Superdense	0.392
TL16	AV 40	Coherent Superdense	0.490

Step 4 - Determine Length and Material Volume from Hull Size

Cross reference the desired hull size in displacement tons on the Hull Size Chart (left) to get the values for Hull Length and the amount of internal volume consumed by hull materials (Mvd) to get a 1 cm thick hull that completely encloses the vessel.

Step 5 Modify length and Mvd by Configuration Type

To get the amount of hull volume consumed by m

Modifiers by Configuration Type

open frame	l x 3.5	Mvd x 2.0
Needle	l x 3.0	Mvd x 1.3
wedge	l x 2.5	Mvd x 1.5
Cylinder	l x 2.0	Mvd x 1.1
Box	l x 1.25	Mvd x 1.2
sphere	l x 1.0	Mvd x 1.0
Dome/disk	l x 1.5	Mvd x 1.2
Close Structure	l x 1.75	Mvd x 1.4
Slab	l x 2.75	Mvd x 1.5

Step 6 - Multiply the Total Mvd by the hull thickness...

...worked out in step 3 to get the total amount of hull volume consumed by structural bracing and armour.

Step 7 - Determine the cost of the Hull

Multiply Mvd (from step 6) by Hull Cost to determine the base cost of the hull.

Explanations

Dtons = Displacement Tons of the required Hull

Length = Length in Meters

Mvd = Displacement Tons of Hull Volume consumed by materials used to enclose the hull in a 1 cm thick shell of hull material.

Example: we are designing a 200 ton merchant vessel.

Unlike other similar vessels this design is going to be special, we are going for a 200 ton wedge shaped frame built at Tech Level 12. We want it to be able to accelerate at 3G, so it will need 30 points of armour (personal scale) to hold together under such strain.

At Tech 12 Superdense has an armour value of 14, therefore hull thickness is 30 divided by 14 or 2.14. The hull thickness will be 2.14 cm.

Next we look at length and material volumes, the length of a 200 ton hull is 17m, multiplied by 2.5 (wedge configuration) for a total of 42m Meters, the material volume is 0.64 tons multiplied by 1.5 for a total of 0.96 tons consumed by a 1 cm hull skin and structural bracing. We multiply this by the hull thickness previously worked out of 2.14, with the result that our hull has a total Mvd of 2.05.

We know that bonded superdense hull materials have a cost of Cr196,000 per displacement ton so the total cost of building the hull shell works out at Cr401,800. At this stage the hull is just a sculpture without life support and engineering it will do nothing move on to the next step (streamlining) to continue designing the vessel.

Step 8 - Streamlining

All hulls start off as Unstreamlined, in this simple system they may become streamlined at an additional cost of Cr1000 per displacement ton of craft, making a vessel fully airframed will cost an additional Cr1000 per ton of craft in addition to the cost paid to make it steamlined. Open frame and planetoid structures cannot be anything other than Unstreamlined.

Step 9 - Optional Features Airlocks and Fuel Scoops

Hull Costs automatically include standard airlocks (typically 1 per 100 tons of craft), there is no reason however why they can't be grouped into larger locks to allow more people to enter or leave the ship at the same time, any number of hatches can be built into the hull for no additional cost. Hatches expose their compartments to exterior conditions immediately once opened.

Fuel Scoops allow the scooping of hydrogen gas from gas giant planets and also allow wilderness refuelling from water in addition to containing hoses and tools to allow frozen water ice from sources of water ice such as ice caps or cometary/Oort bodies to be extracted and used for fuel. Fuel scoops take up no additional volume within the hull by cost Cr1000 per displacement ton of craft and allow skimming of up to 20% of the vessels displacement per hour (I.e. Up to 40 tons per hour for a 200 ton vessel).

Step 10 - Engineering - Jump Drive

The Jump Drive provides a starship with the ability to move interstellar distances. Vessels that have a jump drive installed are starships. Vessels that do not are non-starships and usually used for in-system use. Starships and non-starships may also have a manoeuvre drive, to enable them to travel within a star system. Jump Drives consume vast amount of fuel and require electrical input. Performance is limited by the tech level of design and ranges from 1 to 6 parsecs.

Each vessel will require 1 jump unit per 100 tons of craft, minimum safe (and reliable) jumps require a 100 ton hull. Multiply the jump units required by the characteristics below to include a jump drive in the design.

Jump Drive

		Pwr	Vol	Mcr	Fuel	Fuel Type
TL9	Jump 1	2.0	2.0	8.4	10%	Liquid Hydrogen
TL11	Jump 2	3.0	3.0	12.6	20%	Liquid Hydrogen
TL12	Jump 3	4.0	4.0	16.8	30%	Liquid Hydrogen
TL13	Jump 4	5.0	5.0	21.0	40%	Liquid Hydrogen
TL14	Jump 5	6.0	6.0	25.2	50%	Liquid Hydrogen
TL15	Jump 6	7.0	7.0	29.4	60%	Liquid Hydrogen

Units Required = 1/100 tons of vessel. Minimum safe size = 100 tons

Fuel = % of hull volume in displacement tons per single jump.

Pwr = Continuous power input required per unit to maintain the jump field when drive is active in Mw.

Mcr = Millions of credits per Jump Unit Installed

Fuel = percentage of hull displacement consumed by fuel tanks per single jump

Vol = Volume in displacement tons per jump unit

Whilst a select few races have independently discovered the jump drive, jump science is still poorly understood in the Traveller universe.

The most eminent physicists and engineers argue vigorously over the nature and exact characteristics of jump space. Some fringe 'experts' (much derided by mainstream academia) have even suggested that jump space is itself an artificial construction, most probably made by an unknown ancient and powerful race.

In other places entire religions have grown up around the mysteries of jump space.

Jumps last approximately 1 week give or take 1 or 2 days, gravity interferes with jump drives and ships disappear from the normal universe at jump transition into a parallel universe or dimension that can mathematically be interpreted as a wormhole hence the saying 'time in the hole'.

Jump space has also been known to cause sickness and adverse reactions in some species (even more so when something has gone wrong), whilst others claim that it has psionic effects or can enhance or disrupt natural psionic ability.

All that is known is that there is much, much more to the undulating grey field generated by the drive than can reliably be proven.

Step 11 - Install a Manuever Drive (M-Drive)

For ease of reference, thrust requirements have been broken down into Drive Units, a vessel of any size will need 1 Drive Unit of thrust per 50 displacement tons to move at 1G, multiply this by the desired acceleration in G to determine the exact number of Drive Units required. A quick calculation follows:

Drive Units Needed = Disp/50 x Desired G Rating.

Alternatively you may wish to multiply 0.02 by the displacement tons then by the desired g rating. E.g. 0.02 x 30 tons x 6G = 3.6 units required for a small craft such as a 30 ton ships boat with 6 G acceleration.

E.g. A 200 ton free trader needing a 1G acceleration would only need 4 units of M-drive (200/50 = 4 x 1G = 4). If it needed to travel at 3G it would need 12 units to be allocated to thrust. (200/4 = 4 x 3G = 12 units). These rules assume that spacecraft have an average density of 1 metric tonne per cubic meter of volume, giving an average mass of 14 tonnes per displacement ton of craft. Thus each drive unit represents 700 tonnes of thrust.

Hull	Units - Accelleration in G's					
	1	2	3	4	5	6
100	2	4	6	8	10	12
200	4	8	12	16	20	24
300	6	12	18	24	30	36
400	8	16	24	32	40	48
500	10	20	30	40	50	60
600	12	24	36	48	60	72
700	14	28	42	56	70	84
800	16	32	48	64	80	96
900	18	36	54	72	90	108
1000	20	40	60	80	100	120
1100	22	44	66	88	110	132
1200	24	48	72	96	120	144
1300	26	52	78	104	130	156
1400	28	56	84	112	140	168
1500	30	60	90	120	150	180
1600	32	64	96	128	160	192
1700	34	68	102	136	170	204
1800	36	72	108	144	180	216
1900	38	76	114	152	190	228
2000	40	80	120	160	200	240

For sizes of craft larger than 2000 displacement tons, simply divide the displacement by 50 to get the number of units required to provide 1G of thrust as per the above explanations.

Simply multiply the installed drive units by the values below to determine the characteristics of the installed maneover drive.

High Performance Engines (Values per Drive Unit)

		Pwr	Vol	Mcr	Fuel	Fuel Type
TL9	Fusion Rocket	(+14)	5.6	27.2	0.25	Liquid Hydrogen
TL10	Heplar	35	0.25	0.035	0.63	Liquid Hydrogen
TL11	Thrusters	17.5	1.25	4.4	-----	None Required

Pwr is in MW.

Vol is in Displacement Tons.

Cost in Mcr.

Fuel is Displacement Tons Per Hour Per Unit installed at maximum G, fractional accelerations will use less fuel G-Hours are calculated later on.

Fusion Rockets can be used to generate extra electrical energy which can supply the ship's needs, the additional output in MW (Mega-Watts) is shown in parenthesis (+14).

Step 12 - Lifters

Some starships require lifters to assist their manoeuvring in strong gravity wells, Thruster powered vessels do not need lifters as their performance clearly outclasses drives from lower tech levels. Lifter's are also not required for fully airframed hulls capable of high performance in an atmosphere as the vessel can take off and land like a traditional aircraft. Though needless to say if installed will allow greater control and manoeuvrability.

Lifters use the same calculation as drive units to determine characteristics though usually only enough is supplied to counter 1G of gravitational attraction as thrust is provided to support vertical take and landing etc. Contragrav lifters can supply fractional amounts of thrust for lateral movement though best performance sees the ship's main drive doing this.

Gravitic Lifters (Values per Drive Unit)

		Pwr	Vol	Mcr	Fuel	Fuel Type	LT
TL9	Basic Contra-Gravity	14.0	1.7	0.94	None	None	0.08
TL10	Standard Contra-Gravity	9.35	1.0	1.17	None	None	0.12
TL12	High Efficiency Contra-Gravity	4.70	1.0	1.40	None	None	0.16

Pwr is in MW.

Vol is in Displacement Tons.

Cost in Mcr.

Fuel is Displacement Tons Per Hour Per Unit installed.

LT = Lateral Thrust = The amount of thrust available for horizontal movement in G's.

Ducted Fans

		Pwr	Vol	Mcr	Fuel	Fuel Type	LT	AC
TL8	Ducted Fans	700.0	25.0	175.0	Special	Special	1G	10.0
TL10	Ducted Fans	467.0	16.7	93.52	Special	Special	1G	6.7
TL12	Ducted Fans	350.0	12.5	52.5	Special	Special	1G	5.0
TL14	Ducted Fans	280.0	10.0	28.0	Special	Special	1G	4.0

Ducted fans provide lift only in an atmosphere, the above values assume a standard pressure atmosphere, thrust generated by the fans can be switched to and from lateral thrust, allowing great manoeuvrability. Each of the above units assumes 700 tons of thrust and an average craft density of 14 tonnes per displacement ton of vessel.

At Nap of the Earth levels each unit produces double thrust due to air cushion effects. Ducted fans only require electrical input from the power plant to work, fuel can be added to the air-mix to increase thrust like an afterburner. This increases thrust by an extra 0.5 G and consumes liquid hydrogen fuel (ignited in the array) at a rate in displacement tons per hour as indicated in the AC (after-burn consumption) column. This is usually done at high altitudes for bursts of speed. Ducted cans can be adjusted to produce or slightly more thrust to counter the effects of thinner or denser atmosphere, though will eventually fail in thinner atmosphere types, possibly with disastrous consequences.

Step 13 - Command, Controls and Avionics

All spacecraft require electronic systems to enable them to navigate, detect other vehicles and navigational hazards, and to communicate.

Select at least one system from each category (controls, sensors and communicators) and install the systems in the hull.

What is a G Hour?

Put Simply 1 G of acceleration sustained by the ship's drives for one hour of time, thus a vessel rated at 4G with a fuel burning thruster such as Heplar will be listed as: 4G Heplar (12 Hours at 1G) giving a total of 12 G Hours of Thrust. Should the vessel travel at 4G for 1 Hour it will have burnt 4 Hours of it's fuel load or 4G Hours, 2 Hours at 3G would result in 6 Hours of fuel being burned, thus astrogators and pilots really need to consider how far they need to go and how quickly when plotting courses as available fuel will have a serious impact on this.

Don't forget that when reaching the destination the ship will have to burn an equivalent amount of fuel to slow down, else it will overshoot the target. Thus for a ship with a small fuel bladder (10 G Hours) the maximum it could safely accelerate at would be 5G Hours, leaving the remaining 5 to slow down on approach at the target world. This is without considering the need for a small reserve in case of course corrections/adjustments.

If crews get this wrong then it can often lead to a slow and cold death amongst the stars particularly in quiet, seldom visited or unexplored systems. Gravitic Slingshots and other tricks can be used to supplement fuel on pre thruster vessels.

Step 13-1 Control Infrastructure.

TL	Type	MW	VOL	Cost
5	Basic Mechanical	----	0.001	Cr 50 per displacement ton
6	Enhanced Mechanical	0.0002	0.001	Cr 300 per displacement ton
7	Electronic	0.0005	0.001	Cr 500 per displacement ton
8	Electronic Linked	0.0005	0.001	Cr 750 per displacement ton
9	Computer Linked	0.0005	0.001	Cr 1000 per displacement ton/Mcr 0.0010
10	Dynamic Linked	0.0010	0.001	Cr 1500 per displacement ton/Mcr 0.0015
13	Holographic Linked	0.0010	0.001	Cr 2000 per displacement ton/Mcr 0.0020
17	Synaptic Linked	0.0010	0.001	Cr 2500 per displacement ton/Mcr 0.0025

TL = represents the minimum technological level of introduction

Mw = The amount of power required per displacement ton of craft

Vol = The space required in displacement tons for the infrastructure per displacement ton of craft

Cost = is given in both credits and MegaCredits for ease of calculation in both small and large designs.

The above values represent not the vessel's controls themselves but rather the amount of space, power and cost needed to make the vessels controls work communicate with separate components and represent, conduits, cabling, interfaces, access panels and small, helpful, friendly status readouts and displays dotted about the ship.

Step 13-2 Avionics					Values include all appropriate flight and terrain following avionics.
TL	MW	VOL	Cost	NOE	
7	0.1	0.001	0.100	40 kph	Tech Level 7 Avionics consist of: A Magnetic Compass, Gyrocompass, barometric Altimeter, Radar Altimeter, transponder, All Weather radar, Forward Looking Infra Red (FLIR), Inertial Positioning.
8	0.1	0.02	0.210	120 kph	
9	0.1	0.21	0.211	130 kph	
10	0.1	0.15	0.262	140 kph	
11	0.1	0.15	0.040	150 kph	Tech Level 8 as tech 7 but also includes Imaging Radar
12	0.1	0.10	0.039	160 kph	
13	0.1	0.10	0.040	170 kph	Tech Level 10 and above includes Imaging EMS, Inertial Gravitational Positioning in addition to all TL8 and 7 Components.
14	0.1	0.05	0.041	180 kph	
15	0.1	0.05	0.042	190 kph	
16	0.1	0.03	0.043	200 kph	Higher tech levels are identical but contain more sophisticated terrain following avionics, hence the increase in NOE (nap of the earth) speed.
17	0.1	0.03	0.044	250 kph	
18	0.1	0.04	0.045	300 kph	
TL = Minimum tech level of introduction Vol = displacement tons consumed by the avionics Cost = in Mcr NOE = Nap of the Earth (Terrain following) Speed					Step 13-3Sensors Are essential if the vessel is going to be anything other than blind and are available in several standard suites.

Passive Sensors (Volume by Range Factor)

TL	0.1	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	
7	0.01	----	----	----	----	----	----	----	----	High Resolution Thermal
8	0.01	0.1	0.20	0.30	0.40	0.50	0.60	0.65	0.7	High Resolution Thermal
9	0.01	0.01	0.10	0.15	0.20	0.25	0.30	0.35	0.4	High Resolution Thermal
10		0.01	0.10	0.14	0.17	0.21	0.25	0.28	0.32	Passive EMS
11		0.01	0.07	0.10	0.14	0.17	0.21	0.25	0.28	Passive EMS
12		0.01	0.04	0.07	0.10	0.10	0.17	0.21	0.25	Passive EMS
14		0.01	0.03	0.04	0.07	0.07	0.10	0.17	0.21	Passive EMS
16		0.01	0.02	0.03	0.04	0.04	0.07	0.10	0.17	Passive EMS
18		0.01	0.01	0.02	0.03	0.03	0.04	0.07	0.10	Passive EMS
20		0.01	0.01	0.01	0.02	0.02	0.03	0.04	0.07	Passive EMS
Min			4.0	40.0	300.0	2.5k	20k	300k	1000k	

Mw = Sensor Volume x 0.1

Mcr = Sensor Volume x 2.0

1 range factor = 30,000 km

Simple cross reference the desired passive rating for the design against the available TL to determine the internal volume required by the Passive Array. Most of any passive array will be as sensor blisters on the vessels surface or occasionally as a folding array if the hull is smaller than the minimum displacement as indicated in the 'min' table row above it will not have enough surface area available to mount that particular sensor. Though it may be added as a retractable folding array in which case double the cost and multiply the volume requirements by 2. Min Values are in displacement tons, except where they are followed with a 'k' meaning thousands of displacement tons.

Passive sensors use large antenna arrays to detect any electromagnetic emissions from a potential target. This extremely sophisticated array will scan all known ems bands and attempt to classify targets by their radiated heat, light, radio waves and any other emissions. The passive ems arrays includes laser sensors, radar direction finders, radio direction finders, radiation sensors, passive infra red, light amplification and image enhancement into one tightly integrated and optimised sensor array.

HRT Sensors are also passive sensors and being lower tech than the passive ems array attempt to classify targets via their leaked heat emissions and whilst more limited than their higher tech counterparts can be stunningly useful with computer support.

Most accurate and revealing however are **Active EMS Sensors**, that work by emitting electromagnetic energy and classifying objects by the reflected signals. Active EMS arrays combines radar, all weather radar, ladar, active infra-red and image enhancement into one optimised array.

More primitive radar systems, are identical in principle though limited to sending radio waves and listening to their echoes though with computer help can serve the operator well.

Step 13-4 Active Sensors (Volume by Range Factor)

TL	0.1	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	
7	28.5	----	----	----	----	----	----	----	----	Radar
8	2.14	2.85	3.57	----	----	----	----	----	----	Radar
9	1.1	1.42	2.14	----	----	----	----	----	----	Radar

Mw = Volume x 2.8

Mcr = Volume x 14.0

1 range factor = 30,000 km

TL	0.1	1.0	2.0	4.0	6.0	8.0	12.0	14.0	16.0	
10	0.50	0.71	0.92	1.14	1.35	1.64	2.21	2.57	3.00	Active Ems
11	0.40	0.03	0.42	0.57	0.71	0.78	1.07	1.21	1.42	Active Ems
12	0.15	0.15	0.17	0.23	0.28	0.34	0.50	0.60	0.71	Active Ems
14	0.08	0.08	0.10	0.12	0.15	0.18	0.24	0.30	0.35	Active Ems
16	0.07	0.07	0.08	0.10	0.11	0.12	0.15	0.17	0.18	Active Ems
18	0.05	0.05	0.06	0.07	0.08	0.10	0.12	0.12	0.13	Active Ems
20	0.04	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.09	Active Ems

Mw = Volume x 70

Mcr = volume x 28

Vol = Displacement tons

Step 13-5 Electronic Countermeasures

Radar / Active EMS Jammers

Vessels can mount Radar/Active EMS Jammers of a given tech level and performance. Simply multiply all costs, volumes and power requirements for radar/active ems by 2.

Stealth TL8+

TL	Mw	Volume	Mcr	Type
08	----	0.03	0.05	Stealth
10	0.014	0.02	0.07	Electromagnetic Masking (EMM)

Stealth design minimizes a craft's electromagnetic emissions in the most common bands (radio and infra-red) and uses electromagnetic absorbent materials on the hull surface to reduce the craft's reflected active signature, thus making both passive and active detection more difficult.

EMM (Electromagnetic Masking) includes advanced radiators to dissipate heat and passive emission sources generated by the vessel reducing the chances of detection/target lock even further.

Step 13-6 Survey Instruments

Densitometer (Grav Shielded)

TL	MW	Vol	Mcr	Scanning Depth
11	2.5	2.14	0.75	Surface
12	1.0	1.07	0.9	50m
13	0.9	0.85	0.95	100m
14	0.5	0.64	1.0	250m
15	0.4	0.50	1.5	1km
16	0.3	0.02	1.5	25km
18	0.2	0.014	1.5	

Volume is in displacement tons

Mcr = Millions of Credits

MW = Millions of Watts

Step 13-7 Neural Activity Sensors detect and classify life forms according to their detected levels of brain activity and have increasingly longer ranges as their technological development progresses.

TL	Range	MW	Vol	Mcr
13	5 m	-----	-----	0.02
14	25 m	-----	-----	0.02
15	50 m	-----	-----	0.02
16	500 m	-----	-----	0.02
18	5 Km	-----	-----	0.025
20	50 Km	-----	-----	0.03

Range is in meters or Kilometers as appropriate, MW and Vol entries of ----- mean that the amount of volume and power consumed is so low as to be not important when designing on the spacecraft/starship scale, they will work as long as some electrical power can be provided. Range is very low making these sensors ideal for small craft such as shuttles, pinnacles and vehicles that can scan terrain at close quarters.

Step 13-9 Computers

TL	Rating	Mcr	Vol	Notes
7	Model 1	0.4	0.35	Max Jump =1
	Model 1 Bis	0.5	0.40	Max Jump =2
8	Model 2	0.6	0.35	Max Jump =2
	Model 2 Bis	0.7	0.40	Max Jump =3
9	Model 3	0.8	0.35	Max Jump =3
10	Model 4	1.0	0.42	Max Jump =4
11	Model 5	2.0	0.50	Max Jump =5
12	Model 6	3.0	0.57	Max Jump =6
13	Model 7	4.0	0.62	
14	Model 8	5.0	0.57	
15	Model 9	6.0	0.50	
16	Model 10	10.0	0.42	True Artificial Intelligence possible

Fib computers

Double the cost of the computer is it is a radiation and EMP hardened model e.g. A model 5 fib costs Mcr4.0 each instead of the usual Mcr2.0. Mark it in the design evaluation as computer :model 5 fib x (the number of computers installed) etc.

Bis Computers

Some computers are optimised for astrogation these computers function as 1 level higher when handling jump calculations, hence a model 1 Bis can operate a jump 2 drive. Bis computers may also be hardened in which case double the cost and mark on the design sheet as model 2 Bis/Fib

Any model of computer can be built as a BIS model though this generally requires specialised construction, the most common BIS computers are included in this design sequence. Computers require continuous electrical input to function, though the amount of power required is negligible and drawn from the crafts control system, e.g. The holographic linked control panels etc. As long as there is enough power available to run the control systems, the craft's computers will always function. Vessels without this much power are in serious trouble in any case and will probably not survive long, without or without a computer...

Densitometers are survey instruments and can determine the mass of celestial objects such as planets, asteroids, star and moons etc. In addition to allowing the mapping of mineral deposits and gravitic anomalies, they can also create a 3 dimensional map of dense structures such as underground caves, complexes, buildings and starships to the scanning depth shown.

Neutrino sensors are useful when surveying a star system. They enable a ship to measure the intensity of fusion reactions taking place within a star or a failed star such as a brown dwarf, large gas giant etc.

They can also be used to estimate the power plant output of a target vessels fusion/fission reactor and can be occasionally useful in tactical situations.

Step 13-8 Neutrino Sensors

TL	MW	VOL	MCR	Notes
10	0.01	7.15	1.0	1Gw
12	0.01	0.75	2.0	1Mw
14	0.01	0.35	3.0	10 Kw
16	0.01	0.15	4.0	1Kw
18	0.01	0.07	5.0	1Kw

MW, VOL & MCR are per single installation, volume is in displacement tons.

Notes detail the smallest possible neutrino producing reaction that the sensor can reliably detect in either Gigawatts, Megawatts or Kilowatts respectively.

Every starship or spacecraft will need a computer to coordinate the activities of its many systems.

Non Starships need a minimum of 2, Starships need 3, in either case one computer is a dedicated back up, normally used to simplify maintenance tasks and diagnostic functions.

The characteristics listed are for a single computer. Starships must have a computer rating equal to it's jump drive rating, e.g. A vessel with a Jump 2 Drive must have a computer rated at 2 etc.

Step 13-10 Communications

In the IDP design system, there are 3 standard communication packages for small craft and starships, they are namely a minimal range basic commo set most commonly fitted on small craft and civilian starships, a standard range Improved set (sold as upgrade in ship-yards) and an advanced high performance set most often found on larger vessels.

The exact make up of each is as follows:

Basic Commo sets consist of a 3,000 km Short Range Radio receiver and a 300,000 km or 1000 au laser communicator for longer distance messaging depending on tech level. The Standard Array consists of a 30,000 Km Short Range Radio and an impressive 1000 AU maser communicator that offers superior reliability as it is less affected by atmospheric conditions and the thin interstellar gases and dust that plague the space-ways. The Improved array is impressively outfitted with a 300,000 km short range radio system and a 1000 AU maser system. The Advanced array mounts a maximum 1000 AU range radio comm in addition to a 1000 AU maser comm and is most commonly found on capitol sized vessels and above.

All vessels may mount multiple systems if they have the space within the hull to activate simultaneously or as back up units to replace those that have previously failed due to battle damage or other causes.

TL	Component	MW	VOL	Mcr	Radio	Laser	Maser
8+	Basic Commo	0.25	0.01	0.06	3,000 km	300,000 km	N/A
9+	Basic Commo	0.40	0.01	0.20	3,000 Km	1000 AU	N/A
9+	Standard	1.60	0.01	0.21	30,000 km	N/A	1000 AU
9+	Improved	10.6	0.01	0.27	300,000 Km	N/A	1000 AU
9+	Advanced	20.6	0.01	0.330	1000 AU	N/A	1000 A

Volume for all systems is minimal as the bulk of each array is mounted on the exterior of the hull.

Step 14 Armaments

Step 14-1 Turret Hardpoint sockets

It is a usual rule of design amongst the human dominated Third Imperium to mount one hardpoint turret socket in each 100 tons of craft, as this simplifies logistics somewhat when mass producing vessels to a common standard across vast distances and as such is considered to be a 'rule of thumb' not based on technical requirements. Indeed any vessel may mount any number of turrets, bays or other mounts as can be crammed into the hull. Though this may be a pretty pointless exercise if the required space for powerplants, master fire directors, gunnery crew and additional engineering staff is not available. In all things balance is required. Many vessels of Imperial design break the rule of thumb, such as vessels without jump drives that use the additional space freed up by not having the drive and it's correspondingly large fuel tanks for weapons or other equipment needed to fulfil its mission criteria. Most of these craft are invariably referred to as boats or monitors if designed around system defence needs, or battle riders if they are destined to be carried to other star systems to wage war. Civilian vessels without jump drives are just 'non-starships' or 'space ships' as opposed to jump drive enabled starships.

Hardpoint turret sockets can be included in a design and left empty so that equipment can be added later. If so the cost is as follows.

Turret Type	Vol	Mcr
Light Turret	3	0.005
Heavy Turret	6	0.005

The weapon systems described further on in this book, do not need to have empty turret sockets purchased for them, their costs and volumes include the values needed for their turrets or 'cans' as they are often called.

Step 14-2 Civilian Light Laser Systems

TL	Description	VOL	MW	MCR	S	M	L	E
10	60 mj laser	3	1.7	1.56	1	1	0	0
11	80 mj laser	3	2.2	2.08	1	1	1	0
12	120 mj laser	3	3.3	0.94	1	1	1	0
13	150 mj laser	3	4.2	0.72	1	1	1	1
13	106 mj laser	3	2.9	1.45	1	1	0	0
14	150 mj laser	3	4.2	0.72	1	1	1	1
15	150 mj laser	3	4.2	0.86	1	1	1	1

Mj = output in millions of joules
 Vol= Displacement Tons
 MW= Continuous power input required
 Mcr= Cost in Millions of Credits

S, M, L, E, indicate weapon performance at Short, Medium, Long, Extreme ranges respectively

Step 14-3 Missiles

TL	Type	Vol	Mw	Notes
8	Turret	3.0	0.2	2 Ready Missiles
8	Barbette	6.0	0.2	5 ready Missiles

Missile launchers are available in two sizes: turret, and the larger barbette. Both systems can launch their entire supply of ready missiles in a single turn.

Missile launchers do not have to be crewed when operating as part of a missile battery under the control of a Master Fire Director, but if assigned, a crewmember may launch missiles under local control from the weapon mount.

The number of missiles a ship may control in flight simultaneously depends on the capacity of it's missile Master Fire Directors (MFDs).

Any number of MFDs may be installed; each requires a crewmember to operate it. No ship may have a MFD or military weapon battery of a TL higher than that of its computer system.

Step 14-4 MFD's

TL	CR	Vol	MW	Mcr	USD
9	2	3.1	15.2	36.1	+2
10	3	3.9	13.4	48.1	+3
11	4	2.9	6.4	34.1	+3
12	5	2.3	3.1	25.6	+4
13	6	2.3	3.1	25.6	+4
14	7	1.6	1.8	15.1	+5
15	8	1.1	1.7	9.1	+6

TL = Tech Level of the Master Fire Director
 CR = The Control Rating of the MFD (number of missiles it can simultaneously control)
 Vol = Displacement tons
 Mw = Power needed to operate the system
 USD = The Fire Control Bonus used in combat

Civilian weapons do not have master fire directors and therefore have a CR of 1 and a USD bonus of +1. Weapons /MFD's installed may be any tech level above or below the vessels design as they function independently to the ship's main computer, needing only telemetry from the ships sensors to function properly.

Step 14-5 Heavy Laser Systems

TL	Description	VOL	MW	MCR	S	M	L	E
10*	130 mj barbette	6	3.61	5.03	1	0	0	0
11*	150 mj barbette	6	4.20	6.56	1	0	0	0
12*	251 mj barbette	6	6.97	2.43	2	1	0	0
13	275 mj barbette	6	7.64	2.49	2	2	2	2
13*	650 mj barbette	6	5.56	3.52	2	2	1	0
14	300 mj barbette	6	8.30	2.16	2	2	0	0
14	325 mj barbette	6	9.03	2.29	2	2	2	2
14*	700 mj barbette	6	5.19	3.20	2	2	1	0
15	385 mj barbette	6	10.69	2.20	2	2	2	2
15*	750 mj barbette	6	4.9	3.00	2	2	2	0

* not gravitic focused

The Two M's of Combat (Missiles and MFD's)

In traveller there are two types of ship to ship missile, the high explosive armour piercing warhead and the nuclear bomb pumped detonation warhead (military only).

Missiles can be guided to their target under the continuous control of their gunners or can be switched to semi-independent or fully independent mode. It's important to note that neither missile type will directly impact upon the target, to do so would be to most likely destroy it instantly (See Kinetic Kill Weapons), but would require a highly accurate and effective fire control solution to hit the target. Both detonate close to the target and in the case of the explosive missile, shower the target in debris and shrapnel which can be exceptionally damaging and cripple a small space vessel. The Nuclear pumped versions destroys itself in a titanic explosion which channels high energy x-rays along copper lasing rods, which hit the target as high energy x-ray lasers. Devastating! The laser rods are destroyed within microseconds by the explosion. Nuclear missiles can also be used in some circumstances to generate electromagnetic pulses which can harm computers without optical cores. Not to mention the radiation effects of the said blast!

Kinetic Kill Weapons do exist but are seldom mass produced in the IDP design system. Kinetic weapons include but are not limited to the mass driver, the KEAP missile (sometimes called 'the keeper') and the spore-gun (being exceptionally nasty).

An MFD (Master Fire Director) is a highly specialised and advanced battle computer capable of calculating to a high degree of accuracy, the trajectories, velocities, speeds and closing arcs of all missiles under its control in addition to the position, velocities and predicted flight paths of all targets currently locked by the system, even after taking in account the evasive movements and variable signatures of each. The end result is a highly specialised system that makes it easier to co-ordinate multiple laser batteries to best effect thus delivering more damage to the target as well as making a hit on target easier to achieve in combat/tactical conditions.

MFD's also allow a single gunner to take control of multiple weapon systems provided they are all the same type of weapon at the same tech level to a maximum of 10 independent weapon systems. Needless to say if the MFD is knocked out those weapons would then have to be operated under local control, without any bonuses for the MFD, making them essentially the same as civilian weapon systems.

Mj = output in millions of joules
 Vol= Displacement Tons
 MW= Continuous power input required
 Mcr= Cost in Millions of Credits
 S, M, L, E, indicate weapon performance at Short, Medium, Long, Extreme ranges respectively

Step 14-6 Battery Modifiers

Dmg	No of Weapons									
	1	2	3	4	5	6	7	8	9	10
0	0	1	1	2	2	2	2	3	3	2
1	1	2	2	3	3	4	4	5	5	6
2	2	3	4	5	6	6	7	8	8	9
3	2	4	5	6	8	8	9	9	10	10

To calculate the increased weapon performances of grouped turrets (assisted by master fire directors) simply look at the individual turret damage at a given range and cross reference by the number of weapons in the battery.

E.g. 5 turrets that individually have a S-M-L-E space combat rating of 2-2-1-0 would translate into a single MFD assisted weapon of 6-6-3-2. Needless to say if the MFD is knocked out then each turret must be fired under local control and would only get the rating due to individual turrets.

Overpowering weapons and rate of fire bonuses....

By delivering more power to an energy weapon, it's capacitor can charge more quickly allowing it fire more often in a given combat turn. A designer may deliberately allow for more power to be fed to the weaponry in the vessel's specifications, simply by installing a bigger powerplant thus increasing the electrical energy available to the ships weapons and other systems. Alternatively a desperate engineer may reroute power from other ship's functions to allow rapid firing of the vessel's energy weapons. The formula is as follows:

Normal Input Energy	No Adjustment	e.g. 1-1-0-0 remains 1-1-0-0	ROF	10
Input Energy x 17	+1 at all ranges,	e.g. 1-1-0-0 becomes 2-2-0-0	ROF	100
Input Energy x 34	+2 at all ranges	e.g. 1-1-0-0 becomes 3-3-0-0	ROF	200
Input Energy x 72	+3 at all ranges	e.g. 1-1-0-0 becomes 4-4-0-0	ROF	400
Input Energy x 144	+4 at all ranges	e.g. 1-1-0-0 becomes 5-5-0-0	ROF	800

ROF = Rate of Fire (represents the shots fire per space combat round).

If a Weapon is overpowered at design time, list this in the ship description e.g.

1 x TL 12 120 Mj 3 Ton Laser Turret 3-3-3-0 (ROF 200 +2)

Should power levels fall the weapon's performance will also fall to the default level. This detailed description will allow players to refer to these rules and determine the laser's new performance in the event of a loss of power.

Don't mix Guns!

It should be noted that only weapons of the same tech level and type can be controlled by a single master fire director. The reasons for this are many and varied but revolve around the engineering and technical requirements that a dedicated battle computer, with its own pencil beam sensors and communications arrays needs to control missiles in flight or synchronise the activities of multiple turrets. This level of synchronisation is considerably easier to achieve when all of the weapon systems are the same build, tech level and quality. Hence the familiar naval phrase 'Don't Mix Guns'.

Bay weapons are large movable weapon mounts similar to turrets though magnitudes more powerful. Each Bay Weapon has it's own built in MFD and has a fire control rating as shown in the table below:

Bays require 2 crew each

Bay weapons and Spinal Mounts may also be overpowered

Step 14-7 Weapon Bays

TI	Type	Vol	Mw	Mcr	S	M	L	E	FC
9	Particle Accelerator-Bay	200	1125	156.3	5	4	2	0	+2
11	Particle Accelerator-Bay	100	2282	126.2	7	6	5	0	+3
12	Particle Accelerator-Bay	100	2278	118.6	9	7	6	5	+4
10	Laser Bay	50	125	104.0	2	0	0	0	+3
11	Laser Bay	50	22	85.45	2	2	2	1	+3
12	Laser Bay	50	20	33.40	2	2	2	1	+4
13	Laser Bay	50	22	33.81	2	2	2	2	+4
14	Laser Bay	50	22	23.29	2	2	2	2	+5
15	Laser Bay	50	23	17.34	2	2	2	2	+6
10	Laser Bay	100	28	122.8	2	1	0	0	+3
11	Meson Bay	100	63	105.4	1	0	0	0	+3
12	Meson Bay	100	97	147.0	1	1	0	0	+4
13	Meson Bay	100	96	93.0	1	1	0	0	+4
14	Meson Bay	100	95	92.0	1	1	0	0	+5
15	Meson Bay	100	118	105.3	2	1	0	0	+5

Step 14-8 Spinal Weapons

Meson's are sub atomic particles created in specialist particle accelerators that can pass through normal matter without interacting with it. Having very short half lives (micro fractions of a second) they are fired at relativistic speeds to the target where their decay can be timed to occur explosively within the enemy vessel or installation releasing tremendous amounts of radiation damage. A skilled meson gunner can easily target the surface of a crafts hull should he or she desire and may cause exterior/surface damage in addition to massive casualties within an un-shielded enemy vessel.

TL	Type	Vol	Mw	Mcr	S	M	L	E	FC
11	1000 Mj Meson Gun	92	34.2	130.0	2	1	0	0	+3
11	2000 Mj Meson Gun	250	62.0	316.8	3	2	1	0	+3
11	5000 Mj Meson Gun	764	145.3	939.8	5	3	2	1	+3
12	1000 Mj Meson Gun	48	30.9	65.60	2	1	0	0	+4
12	2000 Mj Meson Gun	120	58.7	141.1	3	2	1	0	+4
12	5000 Mj Meson Gun	352	142.0	393.7	5	3	2	1	+4
13	1000 Mj Meson Gun	55	30.9	65.3	2	1	0	0	+4
13	2000 Mj Meson Gun	126	58.7	140.6	3	2	1	0	+4
13	5000 Mj Meson Gun	354	142.0	392.4	5	3	2	1	+4
14	1000 Mj Meson Gun	39	29.6	48.4	2	1	0	0	+5
14	2000 Mj Meson Gun	97	57.4	111.4	3	2	1	0	+5
14	5000 Mj Meson Gun	287	140.7	320.41	5	3	2	1	+5
15	1000 Mj Meson Gun	36	29.6	42.0	2	1	0	0	+6
15	2000 Mj Meson Gun	89	57.4	104.8	3	2	1	0	+6
15	5000 Mj Meson Gun	277	140.7	313.0	5	3	2	1	+6

Step 14-9 Particle Accelerator Spinal Mounts

TL	Type	Vol	Mw	Mcr	S	M	L	E	FC
10	1025 Mj NPAW	173	42	241	5	3	2	1	+3
10	2500 Mj NPAW	253	83	300	7	5	3	2	+3
10	3600 Mj NPAW	401	114	462	8	8	5	3	+3
11	1025 Mj NPAW	81	35	241	5	3	2	1	+4
11	2500 Mj NPAW	171	76	300	7	5	3	2	+4
11	3600 Mj NPAW	320	107	462	8	8	5	3	+4
12	1025 Mj NPAW	51	32	241	5	3	2	1	+4
12	2500 Mj NPAW	101	60	300	7	5	3	2	+4
12	3600 Mj NPAW	193	104	462	8	8	5	3	+4
13	1025 Mj NPAW	68	32	241	5	3	2	1	+4
13	2500 Mj NPAW	105	73	300	7	5	3	2	+4
13	3600 Mj NPAW	255	104	462	8	8	5	3	+4
14	1025 Mj NPAW	39	31	241	5	3	2	1	+5
14	2500 Mj NPAW	81	72	300	7	5	3	2	+5
14	3600 Mj NPAW	140	102	462	8	8	5	3	+5
15	1025 Mj NPAW	58	31	241	5	3	2	1	+6
15	2500 Mj NPAW	76	72	300	7	5	3	2	+6
15	3600 Mj NPAW	90	102	462	8	8	5	3	+6

Defences

Step 15 Sandcasters

Sandcaster turrets fire canisters of highly reflective crystals and ablative particles into the path of incoming missiles or laser fire. Depending on the exact design of the sandcaster, this 'sand' may be held in place with electromagnetic or gravitic field to assist with the positioning of the cloud, hence the need for electrical input. Shipboard sensors detect incoming tight beam fire control sensors such as laders, masers or microwaves, whilst the turrets battle computer or linked MFD calculates the trajectory and position of the incoming fire.

The projected cloud of artificial 'sand' drains the beam of it's energy and can cause the beam to miss or reduce its intensity when it strikes the hull. Either way the weapon's effectiveness has been degraded. Missiles can often become confused losing their fire control locks or may lose communication with the firing vessel if their tight beam telemetry passes through the cloud and is diffracted. This can cause the missile to miss or detonate early. Skilled gunners can pick up the telemetry again (exceptionally difficult in a battle situation).

Sandcasters can be linked into MFD controlled arrays and use the rules for multiple weapons exactly as printed on the battery modifiers table (Page 32).

Other defences include meson screens available at tech level 12 and nuclear dampers.

TL	Volume	Mcr	Cans	USD	Cannisters
08	3.0	0.60	16	1	Cr400
09	3.0	0.65	18	1	Cr400
10	3.0	0.70	20	2	Cr600
11	3.0	0.75	24	2	Cr600
12	3.0	0.80	30	2	Cr600
13	3.0	0.85	35	2	Cr800
14	3.0	0.90	40	2	Cr800
15	3.0	1.00	50	2	Cr1000
16	3.0	1.05	60	2	Cr1000

TL = Tech Level of the Sandcaster
 Volume is in displacement tons
 MCr = Production cost in Millions of Credits
 USD = Ship Combat Rating
 Cans = Number of ready canisters in storage
 Cannisters = Cost of each canister reload

Step 15-1 Meson Screens TL12+

Meson Screens cause incoming meson fire or meson communication to prematurely decay thus protecting the vessel or installation from the devastating effects of meson fire each screen must be overseen by 1 gunner or appropriate gunnery programs.

Vol	Pwr	Cost	PV100	PV1000
1.4	1	2	2	1
4.3	3	6	3	2
8.6	6	12	4	3
17.0	12	24	5	4
30.0	21	42	6	5
46.0	32	64	7	6
72.0	50	100	8	7
103.0	72	144	9	8
183.0	128	256	10	9
322.0	225	450	11	10
643.0	450	900	12	11
1143.0	800	1600	13	12

Explanation of columns:

Volume - displacement tons of the array.
 Power - Mw required to operate the screen.
 Cost - The cost of the screen, in MCr.
 PV100+ The screen's USD protection value for 100-999 ton ships.
 PV1000+ The screen's USD protection value for 1000-9999 ton ships.

Step 15-2 Nuclear Dampers

Like sandcasters, nuclear dampers are installed in turrets. They target incoming nuclear missiles, using the damper fields to deactivate them. Each damper requires a gunner to operate it.

TL	Vol	Mw	Cost	Mount	USD
12	6	15	2.0	Barbette	No of Barbettes
13	6	9	2.7	Barbette	No of Barbettes
14	6	6	4.0	Barbette	No of Barbettes
15	3	3	4.5	Turret	No of Turrets

TL - The Tech Level of the damper installation.
 Vol - The volume required per damper in displacement tons.
 Mw - The power required to operate the damper.
 Cost - The cost per damper in MCr.
 Mount - The type of weapon mount, turret or barbette.
 USD - The nuclear damper USD factor is equal to the number of dampers installed.

Tractors & Repulsors (Metric Tonnes of Thrust per Displacement Ton of Array)

Array	Mcr	Mw	TL of the Array				
			12	14	16	18	20
Tractor	1.4	0.14	42	420	4200	8400	21000
Repulsor	2.8	0.28	—	—	2800	5600	11200
Manipulator	4.2	0.28	—	—	2800	5600	11200

Mcr = cost in Millions of Credits per Displacement Ton of Array
 Mw = Energy requirements per displacement ton

Note: A Manipulator is a combined Tractor/Repulsor array that can supply variable attraction to a target. Values above are in metric tons, divide by 14 (assume 1 metric ton per cubic meter) to determine displacement tons that can be manipulated by the array.

Utility Features

Step 16 - Utility Features

Shops, labs, grapples, and other optional features, may be essential to the mission success of a given vessel as optional features considerably improve the utility of a design. Simply install as many of the desired features as required to provide the needed functionality as per the mission criteria.

Many commercial vessels can fill an economic niche that more than adequately covers their financial needs, being highly specialised such as disaster relief vessels, hospital ships, lab ships, tenders, fuel tankers or even luxury transports such as specialist yachts like Safari Ship's.

Step 16-1 Shops and Labs

Some of the following shops and labs are especially useful for larger crewed vessels and may be essential depending upon mission criteria, for example, large carriers will almost certainly need a dedicated sick bay and several engineering shops.

Type	Volume	Power	Cost	Notes
Engineering Shop	6	0.6	1.0	1 Shop per 20 engineering crew
Vehicle Shop	10	1.0	2.0	1 per 20 vehicle or small craft crew
Laboratory	8	0.8	5	1 per 2 scientists
Sickbay	8	0.8	0.8	1 per 2 beds

Volume is in displacement tons,
Power is in MW
Cost is in Mcr

Step 16-2 Small Craft External Grapples

Type	Vol	Cost
Unstreamlined	x 0.1	0.001
Streamlined	x 0.3	0.010
Airframe	x 0.5	0.021

Vol = Volume factor in displacement tons (see below)
Cost = Cost per ton of carried craft in Mcr

Volume is equal to the volume of the carried craft multiplied by the volume factor given above, e.g. 0.1,0.3,0.5 for Unstreamlined, streamlined or airframed respectively. Example: A streamlined external grapple for a 95 ton shuttle would require 28.5 tons of machinery and cost Cr950,000 (Mcr0.950).

Step 16-3 Small Craft Hangers

Type	Vol	Cost	Notes
Minimal	x 2.0	x 0.011	Minimal Hangers allow no room for repairs
Spacious	x 4.0	x 0.013	Spacious Hangers allow repair crews to work easily
Launch Port	x 25.0	x 0.053	
Docking Ring	x 1.1	x 0.028	Can fit only 1 specific craft design
Jettison Bay	x 1.05	x 0.042	Jettison a specific craft, 1 use only

To determine the characteristics of internal hangers and launch tubes, multiply the volume and cost of the carried craft by the volume multiplier shown above. Volume is in displacement tons, and cost is in Mcr.

Example a minimal hanger for a 50 ton cutter will require 100 tons of space to set aside and cost Mcr0.55.

Step 16-4 Collapsible Tanks:

Insulated fuel bladders may be carried in the cargo hold to provide additional fuel. This fuel may not be used directly, but must be pumped into the ship's normal fuel tanks before use. Collapsible tanks cost Cr 1400 per ton of fuel carried. When empty, they can be stored at 5% of their full volume.

Step 16-5 Dismountable Tanks:

Dismountable fuel tanks may be carried in the ship's cargo hold to provide additional fuel. Fuel from these rigid tanks may be used directly by the ship's drives. Dismountable tanks cost Cr 2800 per ton of fuel carried, but must be stored at their full volume. A version is also available that can be disassembled to store in 25% of its full volume, at a cost of Cr 7000 per ton.

Fuel Tanks	Mcr	Volume	
Collapsible	0.0014	0.05	
Dismountable	0.0028	1.00	
Dismountable	0.0070	0.25	May be disassembled and stored at reduced volume.

All values are per ton of stored fuel, cost is in Mcr and Volume in Displacement tons, example, a vessel carrying an extra 200 tons of fuel in the hold in collapsible tanks would require 200 tons of hold space available when full, when empty the tanks shrink to their 5% volume or 10 displacement tons and would have a cost of 200 x 0.0014 or Cr280,000 (Mcr0.280).

Docking Rings and Jettison Bays

Docking rings are designed to accommodate 1 specific type of craft, e.g. A modular cutter without allowing any room for repairs or maintenance whilst minimising the amount of internal space used within the parent vessel. If you want to use different types of subcraft within the internal space of your craft a minimal hanger is a better choice.

Jettison bays are designed to explosively eject a craft or lifeboat into space and can only be re-set at a starport if used. The parent ship will lose all streamlining benefits until the bay is reset.

Step 16-6 Extra Fuel Tanks

Any volume of space within the hull may be designated as fuel tankage. There is no additional cost, or power requirement for fuel tanks. Starship fuel is liquid hydrogen. Entering a fuel tank, even partially-filled, is fatal to personnel (even in the best of vacc suits). Empty fuel tanks still contain hydrogen gas, and may be entered, but should be treated as Insidious type atmospheres. Normally, the designer will provide enough fuel tankage for the ship's primary purpose. Additional fuel may be added with collapsible tanks, or dismountable tanks.

Step 16-7 Fuel Refining Gear

TL	Capacity	Volume	Power	Mcr
9	1	0.55	0.11	0.048
10	1	0.50	0.11	0.016
11	1	0.45	0.10	0.014
12	1	0.40	0.09	0.014
13	1	0.35	0.08	0.012
14	1	0.25	0.07	0.0020
15	1	0.20	0.07	0.0021

All values are per displacement ton of fuel refined in 6 hours (capacity) activity. Simply multiply the values by the amount of fuel you want to be able to refine in 6 hours. Thus a small merchant at TL13 needing to refine 20 tons of fuel in 6 hours would have a plant with the following characteristics:

TL 13 Capacity 20 Volume 7 Tons MW 1.6 Cost Mcr0.24 (Cr240,000).

Step 17 Life Support and Artificial Gravity

In the IDP design system there are 3 levels of life support, namely, basic, standard and extended. Basic Life support provides heat, light and short term purified air, it does not include any provision for food or water. Wastes are vented or stored. As time goes on the air will turn 'bad' when it has been exhausted.

Standard life support is as the name implies the 'standard' life support system installed on most space vessels, not only does it provide heat and light but also offers provision for venting/storage of wastes. Water is recycled indefinitely, air quality is maintained by replenishing filters on a regular basis (life support purchased at starports etc) and food is a carried consumable. Solid wastes can be vented or stored.

Extended Life Support is most commonly fitted on military or exploratory ships, as it allows air and water to be purified indefinitely without requiring filters to be changed. Food is a carried resource though it should be noted that all liquid and solid wastes can be recycled indefinitely in desperate circumstances. Crew eating this 'gloop' will succumb to vitamin and mineral deficiencies and eventual illness over time as nutrients are used up in the 'gloop' and not replenished. Most crews will long have mutinied well before this point if other food sources are not located.

Type	Power	Vol	Mcr	
Basic LS	0.0014	0.005	0.005	Heat, Light, Short Term Purified Air.
Standard	0.0028	0.008	0.007	Heat, Light, Provision Storage, limited recycling.
Extended	0.0140	0.016	0.014	Heat, Light, Provision Storage, Unlimited Recycling.

All values are per displacement ton of spacecraft.

Step 17-1 Artificial Gravity

TL	G	Mw	Vol	Mcr
10	1G	0.07	0.01	0.0100
11	2G	0.07	0.01	0.0100
12	3G	0.07	0.01	0.0063
13	4G	0.07	0.01	0.0070
14	5G	0.07	0.01	0.0070
15	6G	0.07	0.01	0.0063

All Values are per displacement ton of craft, Cost is in Mega Credits per displacement ton of craft. G represents the amount of gravities compensated, Power is in Mw. Artificial gravity also includes Inertial Compensation at the appropriate level.

Power Plants

Step 18 - Powerplants

All vessels require a power plant to provide electrical power to run the ship's systems. Total the power required for all systems. Select power plants from the table below until the power requirement has been met. You can add the power output of more than one plant to meet the total power requirement.

Fusion Power Plants (Minimum Base Sizes Tech Levels 9-12)

TL	Volume	Power Out	Cost	Fuel	Notes
09	72.0	2016	201.6	21.6	Minimum Size at this Tech Level
10	36.0	1008	100.8	10.8	Minimum Size at this Tech Level
11	14.5	406	40.6	4.35	Minimum Size at this Tech Level
12	0.71	20	2.0	0.22	Minimum Size at this Tech Level
13	0.07	3	0.2	0.02	Minimum Size at this Tech Level
14	0.02	3	0.2	0.02	Vehicle Plants may be made smaller
15	0.02	6	0.2	0.02	Vehicle Plants may be made smaller
16	0.02	7	0.2	0.02	Vehicle Plants may be made smaller

Volume is in displacement tons, Power Out represents MW of electrical power supplied by the plant, cost is in Mcr and Fuel (liquid Hydrogen) is in tons per year of power plant output.

As technology marches on, fusion power plants become increasingly smaller and more efficient, for each additional ton of power plant added over and above the minimum plant sizes listed above, increase power output, cost and yearly fuel requirements by the following amounts.

Additional Tons of Plant

For each additional displacement ton of power plant over and above that provided by the minimum size installations outlined above add the following characteristics to the design.

TL 9 -12	+Mw 28	+1.0 Ton Volume	+ Mcr2.8	+0.3 Tons Deuterium fuel
TL 13-14	+Mw 42	+1.0 Ton Volume	+ Mcr2.8	+0.3 Tons Liquid Hydrogen fuel
TL 15	+Mw 84	+1.0 Ton Volume	+ Mcr2.8	+0.6 Tons Liquid Hydrogen fuel
TL 16	+Mw 98	+1.0 Ton Volume	+ Mcr2.8	+0.7 Tons Liquid Hydrogen fuel

Deuterium is available for purchase at most starports Price Cr350 per ton in addition to being freely available in most gas giant atmospheres.

Step 18-1 Fission Power Plants

Are still in use throughout known space as they provide excellent amounts of power in heavy vehicles or small space craft that do not have enough on board space to mount a fusion reactor at low tech levels. Though some societies may tightly control the usage of such craft should their reactor design be proven to be 'unsafe'.

TL	Volume	Power Out	Cost	Fuel	Notes
6	2.2	9.0	Mcr3.0	0.50	Minimum Volume at this Tech Level
7	1.5	12.0	Mcr2.0	0.22	Minimum Volume at this Tech Level
8	0.7	10.0	Mcr1.0	0.08	Minimum Volume at this Tech Level

Each Additional Ton of plant over and above the minimum size installations above provides:

TL 6	+Mw 4.2	+1 Ton Volume	+Mcr1.4	+0.75 Tons Radioactive Fuel
TL 7	+Mw 8.4	+1 Ton Volume	+Mcr1.4	+0.15 Tons Radioactive Fuel
TL 8	+Mw 14.0	+1 Ton Volume	+Mcr1.4	+0.10 Tons Radioactive Fuel

Radioactives are heavy elements that require radiation shielding a displacement ton of radioactive fuel to replenish a tired reactor costs Mcr1.05 and masses 266 metric tons.

Volume is in displacement tons, power out in Mw, cost in Mcr and Fuel represents the displacement tons of volume required to operate the plant for one year.

Step 18-2 Fusion+

The miracle power plant of the early Imperium, more delicate and prone to damage than a standard fusion reactor, with a typical life span of a single year. For spacecraft in civilised areas this may well be worth the trade off when you consider the costs.

TL	Volume	Power Out	Cost	Fuel	Notes
10	0.07	3.0	0.01	0.23	
11	0.07	3.8	0.01	0.29	
12	0.07	4.8	0.01	0.37	
13	0.07	6.0	0.01	0.46	
14	0.07	7.7	0.01	0.59	
15	0.07	9.9	0.01	0.76	

The plants can be made smaller than the sizes shown though will scarcely be useful in the starship/spacecraft design scale. Fuel represents the amount of heavy water required to run the plant for one month of continuous operation. Heavy water can be obtained from starports at a cost of Cr4200 per ton or easily mined from suitable cometary bodies or Oort objects and some outer system gas giants (extraction is difficult). Heavy water can also be found in small amounts in most world's water oceans, and can be extracted using a properly configured purification plant.

Step 18-3 Fuel cells

Delicate and costly, fuel cells are often used where their benefits outweigh their cost, being open cycle chemical cells similar in nature to batteries they generate energy from the product of the chemical reactions obtained from their fuel. Fuel for fuel cells is ultra pure High Grade Hydro Carbon Distillates which provide both hydrogen and oxygen compounds in the same liquid. Liquid Hydrogen fuel can be provided with separately provided oxygen in which case multiply fuel consumption by 3 and see below.

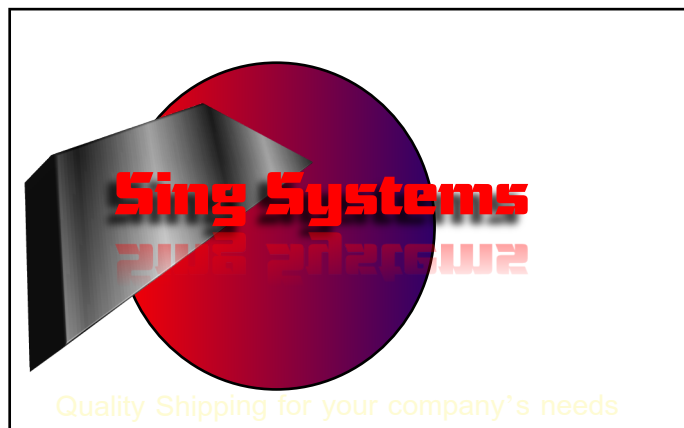
TL	Volume	Power Out	Cost	Fuel
07	1.0	7.0	0.28	0.15
12	1.0	10.5	0.28	0.20
14	1.0	21.0	0.28	0.30
16	1.0	24.5	0.28	0.35

Fuel represents the amount of liquid hydrogen and oxygen consumed per displacement ton of fuel cell per hour. Fuel for fuel cells can be provided as High Grade Hydrocarbon Distillates (HG.Hydro.Dist) as this is often easier to store and more energy dense aboard smaller vessels in which case it costs Cr1400 per ton

Liquid Hydrogen Cr500 per ton 1 ton needed per 10 tons of fuel
 Liquid Oxygen Cr560 per ton 9 tons needed per 10 tons of fuel

Total Combined Cost averages Cr554 per ton

Power Out is in MW, Cost in Mcr, Volume is per displacement ton of fuel cell. Fuel cells have no minimum size though in practical terms there's not much point in installing very small arrays of less than 0.01 ton in size.



Headquartered on Sylea, Sing Systems Lic (formally Sing System's Inc) is a much respected shipbuilder that can trace it's history to the dawn of the old Sylean Federation.

Specialising in Mercantile Designs, we recognise that times have changed and Sing System's designs have changed with them, embracing new technologies and showing clear innovation, whilst being mindful of a design's profitability.

Contact Sing System's Lic (Licensed Imperial Company) to find out how we can meet your company's needs by providing high quality, innovative solutions from the best of all available Imperial Technologies.

Crew Requirements and Accommodations

Step 19 - Crew Requirements

Bridge/Flight Crew: 1 Pilot is required as a minimum for any vessel, if the vessel exceeds 100 tons displacement a co-pilot/navigator should also be installed, larger vessels such as military ships often have 3 times as many pilots and co-pilots as needed so that the bridge or flight deck can be continuously manned at all times of the standard 24 hour day. Vessels do not normally need more than 2 flight workstations.

Electronics: Total the amount of individual communicators (usually 2 per package), sensor arrays, stealth, masking equipment and electronic warfare systems aboard ship, divide this by 6, then divide by the USP computer factor, for amounts less than 1 simply hand over responsibility to a member of the flight/bridge or command crew.

Engineering Crew: 1 per 35 tons of combined Jump, Power and Manoeuvre drives. Engineers have workstations (drive stations) built into each drive they manage at no additional cost or volume.

Gunnery Crew: One gunner is required for each battery installed. Batteries controlled by MFD's only need 1 gunner per MFD station, military ships normally have a gunnery officer controlling his or her battery from an MFD with gunners on hand in each turret or bay ready to take control "weapons free" if ordered to do so or the MFD is incapacitated. One gunner is also required for each sandcaster and damper turret installed.

Screens Crew: 1 operator is required to operate each screen installed, irrespective of its size.

Small Craft Crew: The crew of the small craft, as well as any maintenance personnel (at least one per craft carried, unless otherwise specified), must have quarters aboard the mothership, These personal do not need workstations, but on larger vessels maintenance facilities such as a machine shop may be useful.

Troops: Any number of troops (marines) may be carried. They will require quarters (but not workstations).

Command Crew: Total the above crew, and divide by six (round fractions to the nearest whole number). Command Crew will also require workstations or briefing rooms on larger vessels.

Stewards: Ships that carry high passengers, or have a total crew larger than 25, must have at least one steward. One steward is required per 8 high passengers (or command crew), plus one steward is also required per 50 middle passengers (or non-command crew). Round all fractions up. Stewards do not require workstations.

Medical: Ships that carry passengers of any type must have at least one medic onboard. One medic is required per 120 people carried, plus one per 20 low berths installed. Medical crew does not require workstations but ships with a total complement of 120 or more should have a sickbay

Workstations

TL	Vol	Mcr
09	0.5	0.0010
10	0.5	0.0015
13	0.5	0.0020
17	0.5	0.0025

Any fractional crew requirement less than one (before rounding), can be combined into one position, as long as the total of the combined requirement is still less than or equal to one. Small ships can also be operated under routine conditions (not combat) by fewer than the normal crew. A ship of 100 tons or less can be operated by a single person, and a ship of 200 tons or less can be operated by a crew of two.

Step 19-1 BRIDGE & WORK STATIONS

Volume is in displacement tons

Cost is in Millions of Credits

Add an extra 0.5 ton for bridge workstations.

Workstations are sophisticated terminals connected to the vessels control systems that also include acceleration couches and life support conduits to attach to vacc suits and first aid equipment. A flight deck simply requires a workstation for each crew member. A bridge is in essence identical though with much more room to move around in and allow crew members to change station and hand over to other crew with the minimum of trouble, hence the larger size.

If a ship requires two or more command crew, a bridge must be installed, and the electronics, manoeuvre, MFD and command workstations must be located on the bridge.

A bridge requires 0.5 displacement tons per workstation installed, in addition to the workstations themselves.

Step 19 -2 QUARTERS

Living quarters must be installed for the crew and passengers. High passengers require a large stateroom, and middle passengers require at least a small stateroom/cabin. Crewmembers may have any type of living quarters, but command crew should have quarters larger than enlisted crew; commercial ships typically allocate a large stateroom for the captain (and possibly the executive officer) and small staterooms for all other crewmembers. Low berths are used for low passengers. Emergency low berths hold 4 persons, and are installed on some vessels as a safety measure, or for transporting large animals safely in cold sleep.

Multiply the number of occupants by the characteristics of the selected type of quarters to determine the volume, power, and cost of quarters.

Type	Volume	Power	Cost	
Bunk	1.0	-----	0.005	Combined Bed & Storage Area
Small Stateroom/Cabin	2.0	0.0005	0.040	Standard Crew or Mid Passage Cabin
Large Stateroom	4.0	0.0010	0.100	Luxury Cabin High Passage Suitable
Low Berth	1.0	0.0010	0.050	Steerage Class Accommodation
Emergency Low Berth	2.0	0.0020	0.100	Emergency Use Accommodation
Roomy Seats	0.5		0.0002	Plush Luxury Seat
Adequate Seats	0.25		0.0001	Standard Short Duration Seat
Cramped Seats	0.20		0.0001	Uncomfortable for Extended Periods
Restricted Seats	0.15		0.0001	Uncomfortable for Short Periods
Sanitary Facilities	0.25		0.0001	Washing/Toilet/laundry etc
Acceleration Couch	0.50	0.0001	0.008	See Below

Acceleration couches are for all purposes, workstations without the terminals or dedicated computer links, like a bridge or flight deck workstation, couches will protect their occupant from the effects of sudden accelerations of up to 6G in any direction, making the journey more comfortable for them and increasing the likelihood that the passenger will survive a crash or other disaster. Like regular workstations they all also have dedicated life support feeds allowing a person wearing a vacc suit to plug into them and supplement their resources. Couches also have a small compartment which can include small emergency items such as rescue balls. Ordinary passenger seats may contain some of these features but will not be as effective at protecting their occupants from sudden accelerations or crash effects.

Explanation of columns:

Type - The type of the quarters.

Volume - The amount of space, in displacement tons, required by quarters for one person.

Power - The power required, per person, in Mw.

Cost - The cost of quarters for one person, in Mcr.

Step 19-3 CALCULATE CARGO SPACE

Any volume of space within the hull may be designated as cargo holds. There is no additional cost, surface area, or power requirement for cargo holds. The required cargo hatches are already included in the price of the hull. Most cargo holds have full environmental conditions, (gravity, temperature, and air pressure and composition) unless changed by the ship's crew. The ship's environmental controls allow each cargo hold to be set for a wide range of conditions, so that a hold could be configured to carry refrigerated cargo, or animals requiring a simulated desert environment. Spacer's bars and starports are full of rumours regarding corpses found in cargo bays that have been set to vacuum conditions and serve well to put off some potential stowaways.

Step 20 - CALCULATE COST

Add all of the costs of all of the systems installed in the ship together, from hull to quarters. This is the full cost of the ship. Multiply the cost by 80% to calculate the cost of actually building the ship at a shipyard.

Structure

Disp/50 x Max G (round up)

Armour

Multiply the personal value decided upon when building the hull by the Tech Level of the Design as determined by the highest tech component installed in the vessel. Simply use the calculator's square root function of this number and round down.

Square Root (Personal Armour Value x TL) round down

Estimating the mass of the Vessel

Empty

Simply subtract the amount in tons of fuel and cargo from the total vessel displacement and multiply by 14 to get the empty mass. For Clean mass simply subtract the fuel volume and multiply by 14. Loaded mass is the entire displacement multiplied by 14.

Estimated Empty Mass Disp-Fuel-Cargo x 14 Empty
Estimated Clean Mass Tons - (Fuel/14)
Loaded tons x 14

Size Rating

<u>Displacement</u>	<u>USD</u>
<1	5
1+	6
10+	7
100+	8
1,000+	9
10,000+	10
100,000+	11
1000,000+	12

Armaments:

List all armaments and defences aboard ship in their batteries along with their performances at short, medium, long and extreme range.

E.g., 2 x 120 MJ Light Laser Turrets 1-1-1-0

For Multiple Turrets combined into batteries simply list them as follows: E.g. 2 x 4-120 Mj Light Laser Turrets 3-3-3-2, Meaning 2 batteries of 4 light laser turrets

Also list any screens and their respective performances, and whether any subcraft or vehicles are carried along with any other optional features: A design overview explaining the background and versatility of the design should also be created to provide additional background colour and character for the benefit of the players.

USD Essentials

Hull: List both the hull displacement size, it's internal volume (size x 14m3) as well as it's configuration, streamlining or lack of and both it's personal scale and starship combat armour value separated by a slash. Personal armour value should come first e.g. 20/14

Also list the **USD** size rating then the length in meters, it's structure rating and the tech level of the design as represented by the highest tech component installed. Cost should also be listed with quantity discounts and to 3 decimal places, e.g. Mcr42.123 (In Quantity).

Engineering: List the type and rating of all main drives. This is the acceleration for the M-Drive, the Suspension Type if required, the Jump Drive range in parsecs (if required) and the Power Plant Rating. This can be calculated as 2 x Power Plant Output in Megawatts divided by hull size in displacement tons. Round this number down to the nearest whole number.

Also list the amount of time the drive can function for at 1G (this is unlimited for thrusters), with 20 to 30 hours being considered optimum for reaction engines.

Also list the vessel's refining gear (if any), it's performance for a full load in x hours, minutes etc, whether fuel scoops are present and the amount of fuel they can scoop in displacement tons per hour as well as a breakdown of the vessel's fuel requirements and types. E.g. 20 Tons for 1 x Jump 1, 1.52 Tons reactor fuel for 1 year (liquid Hydrogen, heavy water or radioactives). If collapsible or Dismountable tanks are included in the design make a note of it here. Also list the cargo capacity of the design if applicable.

Crew Detail: A complete breakdown of the needed crew positions, e.g, 1 x Pilot, 2 x Engineer etc.

Accommodations: List every stateroom, small cabin, bunk, low berth, emergency low berth, passenger couch or seats etc for both the crew and passenger sections.

Electronics: List all computers, avionics, sensors, Jammers, stealth, electro magnetic masking packages communication suites and fire Control along with their ratings if applicable, e.g. Standard Commo TL10, Passive Ems (P=3) etc.

Example Design

A 200 ton 'Speculator' Class Merchant TL-12

Component	Pwr	Vol	Mcr	Notes
Hull				
Armour Value 10				
Displacement: 200 tons		(+200)		
Length: 17 meters				
Configuration: Wedge				Length extended to 42.5m
Hull Thickness: 0.71 cm		0.96	0.18816	Vol modified from 0.64
Streamlining			0.200	
Fuel Scoops			0.200	20% of hull capacity
Engineering:				
Jump=1	4.0	4.0	16.80	Jump 1 Capacity
Jump Fuel		20.0		1 x Jump 1
M-drive	70.0	5.0	17.6	Thrusters - 1G
M-Fuel				None Required
Lifters				Not Required
Command & Control:				
Dynamic Linked	0.200	0.200	0.400	
Avionics TL12	0.1	0.1	0.039	Noe = 160 Kph
Passive Sensors	0.001	0.01	0.02	Passive Ems =1
Active Sensors	10.5	0.15	4.2	Active Ems =1
Computers		1.05	1.2	Model 1 x 3
Commo	1.6	0.01	0.21	Standard Commo
Armaments				
2 x 120 Mj Laser Turrets	6.6	6.0	1.88	1-1-1-0
1 x TL12 MFD	3.1	2.3	25.6	+4 USD
Optional Features				
Collapsible Tanks		1.0	0.028	Extra 20 tons when inflated
Fuel Refiner	0.45	2.0	0.07	5 tons per 6 hours
Standard Life Support	0.56	1.6	1.4	
Artificial Grav (TL10)	14.0	2.0	1.26	1G Compensated
MW Total				
Fusion Base Plant	111.11			
Fuel 1 Year	(+20.00)	0.71	2.0	Example of Calculation Only
Additional 4 Units		0.22		Combined Plant has a volume
Fuel 1 Year	(+112.00)	4.0	5.6	of 4.71 tons, requires 1.42 tons
		1.2		of fuel per year and outputs
				Mw132 and costs Mcr7.6
Accommodations				
Small Staterooms x8	0.004	16.0	0.320	Crew Accommodations
Captains Stateroom x1	0.001	4.0	0.100	Captains/Master's Cabin
Passenger Staterooms x 6	0.006	24.0	0.600	High/Mid Passage Staterooms
Low Berths x 20	0.020	20.0	1.000	Low Passengers
Workstations x 4	-----	2.0	0.008	
Cargo:		81.49		
Totals	111.141	200	80.92316	

Crew Detail:8

Pilot-1 Copilot/Astrogator-1 Engineer-1 Gunnery-3 Medical-1 Steward-1

Example Design Evaluation

The Gunflower a 200 Ton Speculator Class Merchant

Hull:	200 Tons/ 2800 m3 Size:8 Length 42.5m Structure:4 Mcr 64.738 in quantity	Wedge(Streamlined) Armour:10/10 TL:12
Engineering:	Power Plant Jump Drive Manoeuvre Drive Fuel:21.42 tons	1 (132 Mw Fusion Plant) 1 (1 Parsec) 1G (Thrusters, Duration Unlimited) Refine: 25 Hrs 42 mins Scoop 40 Tons in 1 Hr 20 Tons for 1 x Jump 1 1.42 Tons reactor fuel - Duration 1 Year Collapsible Tanks in Hold (additional 20 Tons)
Cargo:	81.49 Tons	
Electronics:	Controls: Computers: Avionics: Fire Control: Commo: Sensors	Dynamic Linked, Flight Deck with 4 Workstations 3 x Model 1 Standard TL12 Noe 160 kph +4 1 x MFD Standard P=1 A=1 J=0 No Jammers or Countermeasures
Armaments:	2 x 120 Mj Light laser Turrets	1-1-1-0
Screens:	None	
Subcraft:	None Carried	
Accommodations:	Crew: Passengers: Life Support:	8 x Small Staterooms, 1 x Large Stateroom 6 x Large Staterooms, 20 x Low berths Standard & Artificial Gravity - Compensates 1G
Crew Detail:8	1 x Pilot, 1 x Astrogator, 1 x Engineer, 3 x Gunnery, 1x Steward, 1 x Medical	

The Speculator class merchant is an up-gunned design first produced by Sing Systems Inc (now Sing Systems Lic), a former corporation centred in Sylean space that quickly subscribed to the IDP ship design system with the arrival of the new Imperium. Thus vessels of this design can be encountered all over core sector and beyond. The empire had need for a versatile armed merchant capable of operating in exploratory markets near and just beyond the ever expanding Imperial frontier. Whilst expensive for a jump 1 capable ship, it does have a number of notable features that more than make up for the high price tag, namely the two tech 12 120 Mj laser turrets pre-installed in every build, coupled with a military grade master fire director giving it a nasty bite and a tough reputation well understood by raiders and semi-professional pirates and privateers.

A full crew complement of 8 is required to manage the sophisticated systems crammed into its 200 ton wedge shaped hull, this can fall to 6 by dispensing with the gunners having each turret solely controlled from the MFD station on the flight deck, though this invariably gives up the option of firing the turrets under local control should the mfd be knocked out, it's commonly done in order to save some cost in crew salaries and free up staterooms for other uses. At a push the medic and steward position can also be combined to save costs though this can make the consistent delivery of high passage services problematic if all of the 20 low berths are full.

The vessel comes fitted with collapsible tanks as standard allowing it to cross from one main to the next and make 2 parsec jumps by stringing together 2 consecutive jump 1's. This versatility and toughness often see this class of starship used by the Imperial authorities as auxiliaries and logistical support for Imperial units. Conventionally this design is not a cost effective operator for freighting though an imperial subsidy is available for ex-military personnel that would like reserve commissions in their respective services, which is a rather handy way of subsidising the mortgage whilst remaining semi independent but also in the service of the Imperium. No vehicles or subcraft are carried as this would further erode profitability by tying up yet more hold space. Citizens wishing to venture away from their vessels are forced to make the most of whatever local transport is available.

Hybrid Class 20 Ton Launch

The Hybrid Class 20 Ton Launch

Hull:	20 Tons/ 280 m3 Size:7 Length 16m Structure:1 Mcr 3.147 in quantity	Cylinder(Streamlined) Armour:10/10 TL:10 (some lower tech components)
Engineering:	Power Plant Manoeuvre Drive Suspension: Fuel:3.78 tons L-hyd	1 (TL7 12 Mw Fission Plant) 1G (Heplar, 30 Hours at 1G) Contra Grav Lifters also produce 0.12G lateral thrust. No Refining Equipment Aboard No Scoops 0.22 Tons reactor fuel (Radioactives) - Duration 1 Year
Cargo:	7.58 Tons	
Electronics:	Controls: Computers: Avionics: Fire Control: Commo: Sensors	Dynamic Linked, Flight Deck with 2 Workstations 2 x Model 1 Standard TL10 Noe 140 kph None Standard Tech 9 P=1 A=0 J=0 (Passive Ems Only) No Jammers or Countermeasures
Armaments:	None	
Screens:	None	
Subcraft:	None	
Accommodations:	Crew: Passengers: Life Support:	2 workstations on Flight Deck 6 x Roomy Seats Standard & Artificial Gravity - Compensates 1G
Crew Detail:1	1 x Pilot, 1 x Optional Co-Pilot or Vessel Commander	

The Hybrid class launch is a common sight throughout Imperial space, built from the ground up to be of service to the lower tech worlds of the Imperial frontier, the hybrid is a mish mash of some old proven technologies. Notably the vessel mounts a minimally sized TL7 fission reactor with enough onboard radioactive materials to produce energy for 1 whole year of continuous operation.

Onboard fuel tankage of 3.78 tons liquid hydrogen is enough to produce 30 hours of thrust at 1G for it's Heplar Main Drive making long flights possible but not especially comfortable given that there are no staterooms, cabins or bunks aboard, just two flight deck workstations and 6 roomy passenger seats. Should fuel be exhausted the vessel's contra grav lifters will produce 0.12G of thrust provided the vessel is within 10 diameters of a significant gravity well.

Whilst it doesn't have the performance of a higher tech version, such as the new Zhunastu designed launches that mount thruster plates and micro-fusion plants it should be noted that it doesn't have the price tag either being available in quantity at a modest Mcr3.147 making it popular with merchant lines and other businesses looking for cost effective in-system support. It's 7.58 ton cargo hold can be customised to store small vehicles, more passengers with couches, seats, luxury fittings, staterooms or cabins or can be outfitted with additional electronics.

This design of the launch doesn't have any provision for armaments or defences, which is just as well when you consider just how fragile this vessel when it's armour is no longer able to protect it.

The Venture Bird Class 30 Ton Utility Boat

Hull:	30 Tons/ 420 m3 Size:7 Length 23m Structure:4 Mcr 21.210 in Quantity	Wedge(Airframed) Armour:60/28 TL:12
Engineering:	Power Plant Manoeuvre Drive Fuel:0.52 tons L-hyd	6 (TL 12 104 Mw Fusion Plant) 6G (Thrusters) No Refining Equipment Aboard No Scoops 0.52 Tons reactor fuel - Duration 1 Year
Cargo:	13.02 Tons	
Electronics:	Controls: Computers: Avionics: Fire Control: Commo: Sensors	Dynamic Linked, Flight Deck with 2 Workstations 2 x Model 1 Standard TL12 Noe 160 kph None Basic Tech 9 P=1 A=1 J=0 No Jammers or Countermeasures
Armaments:	1 Empty 3 Ton Socket	
Screens:	None	
Subcraft:	None	
Accommodations:	Crew: Passengers: Life Support:	2 workstations on Flight Deck 10 x Adequate Seats Standard & Artificial Gravity - Compensates 3G
Crew Detail:1	1 x Pilot, 1 x Optional Co-Pilot or Vessel Commander	

Designed for rapid interface operations, this gull winged, high strung thoroughbred design is fully airframed and designed to provide aerodynamic lift and stability in even the thinnest of atmospheres. It's powerful thruster array will propel the craft at 6G for a year (until it's reactor fuel runs dry).

It has no scoops or refining gear as fuel needs are minimal at 0.52 tons for a whole years electrical operation. This tough little craft is stressed to cope with 6G acceleration, although it's onboard life support and artificial gravity will only negate 3G in routine operations. It's normally supplied with 2 workstations on it's flight deck and 10 adequate passenger seats (suited to shorter duration journeys). Luxury operations can be added at the expense of cargo.

It's primary purpose is for the passage of personnel, small cargoes and military/vip personnel between surface and orbital installations (vips normally have roomy seats).

Some wildcatter communities like these vessels as they can withstand significant atmospheric pressures, dive deep into gas giants and if loaded with survey instruments can greatly assist wildcatting operations, by tracking down regions of propane rain and other atmosphere suspended chemical resources.

Also popular with the military and mercenaries alike this vessels makes an excellent combat lander and logistics boat, thanks to it's tough skin and solidly built hull, hence the inclusion of a 3 ton (empty turret) in the design, excess power for weapons and fire control equipment is an impressive Mw27.179, allowing turret weaponry to be overpowered thus increasing the rate of fire options of energy weapons. Whilst combat is not it's primary function, increased rates of fire do mean that this vessel can be a potent threat to incoming starships or space vessels. Indeed these vessels have frequently been seen in semi permanent settlements such as military encampments and scientific field units such as those used by archaeologists and field scientists. The Designers deliberately included umbilical hookups from the vessel's energy grid to allow for this eventuality in order to fulfil the design criteria's 'utility' brief.

Golden Redemption Class Scout/Courier

Hull:	100 Tons/ 1400 m3 Size:8 Length 35m Structure:4 MCR 51.230 in quantity	Wedge(Streamlined) Armour:20/14 TL:11
Engineering:	Power Plant Jump Drive Manoeuvre Drive Fuel:21.914 tons	2 (126.76 Mw Fission Plant) 2 (2 Parsec) 2G (Thrusters, Duration Unlimited) Refine: 60 Hrs exactly Scoop 20 Tons in 1 Hr 20 Tons for 1 x Jump 2 0.914 Tons reactor fuel - Duration 1 Year (Radioactives)
Cargo:	20.361 Tons	
Electronics:	Controls: Computers: Avionics: Fire Control: Commo: Sensors	Dynamic Linked, Flight Deck with 2 Workstations 3 x Model 2 Standard TL11 Noe 150 kph 0 (None) Improved P=4 A=2 J=0 (Passive Ems is a Folding Array) Densitometer - Surface Neutrino 1Gw No Jammers or Countermeasures
Armaments:	1 x 80 Mj Light laser Turret	1-1-1-0
Screens:	None	
Subcraft:	1 Minimal Hanger for a 2 Ton Air/Raft (Not Included)	
Accommodations:	Crew: Passengers: Life Support:	4 x Small Staterooms None Extended & Artificial Gravity - Compensates 2G
Crew Detail:3	1 x Pilot, 1, 1 x Engineer, 1 x Gunnery	

Notes, a 35 meter long streamlined wedge shaped configuration made from crystaliron and thoroughly typical of small scout craft throughout the Imperium. As you'd expect this older version of the scout courier is still commonly seen throughout the Imperium and occasionally falls into service when de-fleeted as a courier or seeker. Lone prospectors and explorers also like this model as it's extended life support will keep on recycling air and water between annual services reducing logistical needs on extended operations. It's generous cargo hold and small craft hanger also increase this vessel's utility though this has been achieved at the expense of a decent fuel refiner and crew accommodations. Like lots of lower tech smaller vessels it mounts an old fashioned TL8 fission plant that has enough radioactive fuel to last 1 year of operations at full power. Needless to say changing the fuel is a specialised task that can only be done at suitably equipped starports or scout bases.

Hubris Class Far Trader

Hull:	200 Tons/ 2800 m3 Size:8 Length 42.5m Structure:4 Mcr 56.443 in quantity	Wedge(Streamlined) Armour:10/10 TL:11
Engineering:	Power Plant Jump Drive Manoeuvr Drive Suspension Fuel:65.2 tons	2 (229.94 Mw Fission Plant) 2 (1 Parsec) 1G (Heplar, Duration 10 Hours at 1G) Standard Contra Grav 0.12G Lateral thrust Refine: 24 Hrs Scoop 40 Tons in 1 Hr 40 Tons for 1 x Jump 2 25.2 Tons for 10 G Hours Thrust 1.651 Tons reactor fuel - Radioactives Duration 1 Year
Cargo:	45.83 Tons	
Electronics:	Controls: Computers: Avionics: Fire Control: Commo: Sensors	Dynamic Linked, Flight Deck with 4 Workstations 3 x Model 1bis Standard TL11 Noe 150 kph None Standard P=1 A=1 J=0 No Jammers or Countermeasures
Armaments:	2 x Empty 3 Ton Turret Sockets	
Screens:	None	
Subcraft:	None Carried	
Accommodations:	Crew: Passengers: Life Support:	4 x Small Staterooms 7 x Large Staterooms, 4 x Low berths Standard & Artificial Gravity - Compensates 2G
Crew Detail:4	1 x Pilot, 1 x Astrogator, 1 x Engineer, 1x Steward/Medical	

Another Hybrid Design from Core Systems Inc, based on an original template from the Chanestin Kingdom (now integrated into the Imperium). The Hubris Class Far Trader, is 3 decks tall, wedge shaped, dotted with lots of tiny view ports and like many smaller merchant designs built at lower tech levels mounts a primitive fission plant coupled to a heat/exchanger ignition system that feeds liquid hydrogen fuel to the vessel's Heplar drives. Once widely seen this class has fell into disuse and is now a rare sight in and around the Imperium due to the fact that more modern thruster based ships are not only more economical to operate but can out-perform the Hubris class on almost any level.

The Hubris class carries sufficient fuel for 1 Jump 2 and 10 G hours of thrust, supplementing this with jump discharge mass increases the available thrust to 25.87 hours, it's not ideal for long range work in systems, but is ideal for short runs to jump range and a direct trip into the destination main world. When fuel is exhausted the vessel's contra grav drive can produce 0.12G lateral within 10 diameters of a sufficiently massive nearby world. Indeed this may even be required at some ports that berth their vessels closely together due to shortages of room (No one wants a Heplar engine pointing at them at close quarters). It's radioactive reactor fuel lasts for one year of continuous use and can only be changed at suitably equipped ports (Usually Class A & B) and is most often changed at annual maintenance. It's small crew of 4 is sufficient for routine operations, though may need to be increased to 6 with the addition of two gunners should the vessel be armed (1 for each turret) unless of course they are to be fired under computer control.

It's fuel scoops and small refiner ensures that it can live off the land and thus function well as an exploratory merchant.

Most surviving members of this class can be found on or around the Imperial frontier where profit opportunities are more numerous (particularly beyond the frontier) where a shrewd and often unscrupulous captain can make a fortune in one of the 'Grey' trades, such as human trafficking, smuggling, piracy and high cost passage and transport to dangerous worlds not commonly approached by more timid merchants.

The Dynamic Task System

An Alternative Traveller Task System for use with Traveller T4 and Classic Traveller..

The following Task system is offered as a replacement to the one found on pages 49 and 50 of the T4 (Marc Miller's Traveller) Rule Book though can be used with any d6 version of traveller, though is best suited for use with Classic Traveller if not Traveller T4.

Characteristics Count

In order for the system to work, character's need to roll under a target number equal to the character's relevant characteristic/attribute for success (e.g. Dex when piloting, Int or EDU when programming a computer. STR when lifting heavy objects etc.). All rolls are on 2 six sided dice and are modified by the task difficulty.

Task Difficulties.

Tasks can be made easier or harder depending on circumstances and may be, easy, average, difficult, formidable, staggering and impossible, as per the main rules on page 49 and 50 of the T4 Rule Book. Though with the following adjustments to the target number as follows:

Easy	+2
	+1
Average	-0
	-1
Difficult	-2
Formidable	-3
Staggering	-4
Impossible	-5

Unlike other task systems, skills are not added to the target number/characteristic to increase the chance of success.

Success and Failure

Rolling under the Target Number (Attribute plus or minus task difficulty modifiers) is a success, rolling above it is a failure.

Partial Success/failure.

Should a roll exactly equal the Target Number the referee may decide that this is a partial success or failure and apply some penalty or other ruling as appropriate, though some exceptions apply:

A roll of 2 is always a success and a roll of 12 is always a failure.

The average human character in the Traveller universe generally has attribute/characteristic values of 6 to 7, higher levels are thus their own advantage and represent above average reflexes, strength, intelligence, Social Class or background knowledge as appropriate, making the likelihood of success higher. Low levels under this system are a self fulfilling penalty.

And Skills do....

Skills Reduce Task Difficulties by 1 per level of skill. Thus an expert character with with rifle-3 would see the task at hand of shooting someone reduced by 3 difficulty levels. Task difficulties also have a numerical rank for ease of calculation, ranging from 0 to 5 (easy to impossible).

Difficulty		TN
0	Easy	+2
1	Average	-0
2	Difficult	-2
3	Formidable	-3
4	Staggering	-4
5	Impossible	-5

e.g. Pistol-3 reduces the difficulty by 3 levels making a formidable task, (3 -3 =0) easy, and an impossible task merely difficult (Task Difficulty 5 - 3 skill = 2 Difficult).

Easy Tasks +1 or +2 TN

Are those that are considered simple for a minimally skilled character, such as servicing an Internal Combustion engine for a trained mechanic. Easy Tasks require some skill to accomplish, but are routine enough to not be especially challenging. Minimally trained characters (skill level of 1) generally have enough competence to match an easy task without much difficulty succeeding roughly 83% to 92% of the time. Easy Tasks adjust the target number by +1 or +2 as the referee sees fit.

Easy tasks can be made harder, e.g. rushing or attempted in hostile conditions in which case simply increase the task difficulty level. Tasks that require less challenging conditions than 'easy' may be deemed trivial and given additional positive modifiers as the referee deems appropriate though may be better off being treated as an automatic success in order to keep the action moving, if they really are that 'easy'.

Average Tasks -0TN or -1TN

Are those tasks that pose little difficulty for a competent character with a solid skill set such as driving an ATV across clear but rough ground. Average tasks do not generally modify the target number though may have a -1 penalty applied to them if the referee deems the situation at hand to be slightly more challenging than 'average' whilst not tough enough to be 'difficult'

Difficult Tasks -2TN

May be difficult for most people though relevant expertise will really come into play here and make a difference, high skills really separate the professionals from amateurs, as skilled characters can easily generate consistent results. Difficult tasks have a negative modifier of -2.

Formidable Tasks -3TN

Tasks at this level of difficulty are troublesome for all but the most skilled of characters. They are the sort of things that only an expert can accomplish with any sort of regularity. Formidable tasks have a negative modifier of -3 to the target number.

Staggering Tasks -4TN

Staggering tasks should be attempted only by experts, usually with the best of preparation and time. Staggering tasks usually have disastrous consequences if they go wrong and should be approached with caution. Staggering tasks have a negative modifier of -4.

Impossible Tasks -5TN to -6 or lower

Attempted by the truly, mad, brave or desperate, these task have little likelihood of success for all but the most expertly skilled and equipped characters, like staggering tasks, the consequences of failure may be unbearable, hence a negative modifier of -5 is harsh yet appropriate, should the situation be extra 'impossible', e.g. A rushed task, then the difficulty modifier can be deemed 'hopeless' and made even lower such as -6 or even -8.

Other Bonuses and Tactical Pools

Equipment and the help of other's can further modify the task difficulty increasing the likelihood of success, e.g. special scoping equipment on a rifle or tactical advice from a colleague in the midst of combat or other similar effects can effect the task outcome.

If this is the case treat the allocated bonus as additional attribute points, which will raise the target number accordingly.

Example, a character with Dex 8 is using a sniper rifle to hit a target at long range, and has a rifle range bonus for aimed shots of +4 (as per the T4 Ground Combat Rules Pages 51-62). The task difficulty to hit something at long range is staggering. His skill of rifle-2 reduces this to difficult (TN-2) meaning that he needs to roll 6 or less on 2d6 to succeed. However the rifles range bonus +4 raises this to 10 making success far more likely. It's amazing what good equipment can do for you.

Likewise roving modifiers from Tactical pools can be applied this way, assuming that all players are in agreement prior to spending the points and most importantly their characters have some way of communicating tactical information together. Characters not in contact cannot contribute to the pool. Also characters should not be allowed to draw off any more points than can be supplied by the character with the highest tactics skill.

Example:

The crew of the Imperial Merchant Ship 'Gunflower' are in a pitched fire-fight with some nasty locals in an abandoned factory. The crew have a combined tactical pool of 11 points between them and are all in contact with each other as they are wearing comm dots connected to short wave radios. Big Jake the ship's 'purser' has the highest tactical skill at level 4, everyone else has levels 1 to 2 or none at all. No character can draw more than 4 points out of the 11 to effect any one task, though may continue to draw points with the consent of the other players for other tasks throughout this encounter.

Typical Weapon Range Modifiers

Just like the T4 ranged combat rules on pages 55 and 56 of the T4 Main Book, this system allows positive modifiers to the target number for weapon types and are applied exactly as per the ranged combat rules in the T4 rule book.

Diff	Combat Range	Equiv Distance	Range Mod	Task Difficulty	TN
0	Contact	0-3 m	+0	Easy	+2
1	Very Short	4-15m	+1	Average	-0
2	Short	16-45m	+2	Difficult	-2
3	Medium	46-150m	+3	Formidable	-3
4	Long	151-450m	+4	Staggering	-4
5	Very Long	451-1500m	+5	Impossible	-5

Lvls = Task difficulty levels reduced by Range Bonus

Diff = Difficulty Equivalent number

Example

E.g. Gilliki is a marine with a grudge. The Imperium has recently occupied the world of Aursis (1134 A545522-B) on the fringes of Core Sector many of the locals were less than welcoming, since occupying one of the larger buildings in the Capitol city of Shanira and using it as a base, the tower block has come under sustained sniper fire, killing and wounding many of his colleagues over several weeks. Numerous patrols have tried to flush the insurgents out, but they simply melt away into the city and return when the patrols have gone. Gilliki and his team have occupied the highest positions available on the roof of the HQ and are eagerly scanning the rooftops below for any sign of insurgency. He is proficient (skill 2), but hardly a sniper, though he's naturally steady (Dex 9) with his Advanced Combat Rifle (not the best sniping tool). Gilliki lies in wait for hours on the roof of the HQ watching the underlying and nearby buildings waiting for an opportunity to strike back.

Suddenly there's a loud crack of gunfire, Gilliki is lucky enough to see the incoming muzzle flash of an insurgent's rifle from a nearby roof. He's spotted the enemy about 60 meters away slightly below him and partially under the cover of a rooftop air-conditioning unit. The insurgent is dangerously close to the HQ and is in a great position to set up a mortar.

The Target number is 9 (DEX 9) and the task difficulty is Formidable TN-3, this is modified by his skill, rank 2 means reduce the task difficulty by 2 levels, making a quick shot (snap fire) at this range an average test of Gilliki's abilities and would have a better than average chance of being successful (TN=9-0 =9) if the insurgent wasn't firing from a position of cover. Gilliki wants to be sure and presses his eye to his rifle's scope. At this point the weapon's range bonus kicks in for an aimed shot +3 making the task considerably easier. The Target Number is now 12 (TN 9 +3 Equipment bonus). As the insurgent is partially hidden (the air-conditioner) the referee applies an additional penalty of -4 as per the rules for cover and concealment (T4 Rule Book Page 57), the target number is now 8 (12-4 = 8).

Gilliki squeezes the trigger, (his player rolls a 7) his return fire does the trick and the insurgent rolls out from behind the air-conditioning unit in agony as Gilliki's bullet passes right through his chest, reeling from a shot that only an experienced warrior like Gilliki could place. The referee describes how the insurgent crawls more fully behind the air conditioner for better cover, leaving droplets of blood on the plasteel roof as he does so.

Gilliki decides to radio his superior and report the sighting, the marines will most probably send a patrol to capture the insurgent, as he could be a useful source of information, provided that he doesn't bleed to death in the meantime.

Exceptional Success

On a roll of 2 directly, roll 2d again, if the result is under the target number then the referee should award some bonus, such as saved time, extra damage or more information as appropriate.

A character is attempting to gamble his way to financial success in a sleazy casino, he's spent some time 'watching' the various gambling machines and his going to try his luck. He's an expert at this type of thing (Skill Gambling 3) having spent many years studying gambling machines and their algorithms. He also has an intelligence of 10 which comes into play as he is trying to work out when the machine will next pay out as these devices tend to follow pre-programmed rules. His target number is 10 the referee decides that this is a staggering test of gambling (TN-4) so the target number is 6. The character's gambling skill comes into play and reduces the task difficulty by 3 levels, making this an average test of our genius gambler's abilities, raising the target number to 10 (Int 10 - 0 average task = 10). The player rolls a 2, the referee asks him to roll again, he rolls a 6. Not only has the character been successful, but he's been exceptionally successful. After a while the machine hits the jack pot in response to the character's informed game play dropping every coin in it. After getting a round of applause from some fellow gamblers he decides to call it a night and return to the ship, Cr20,000 richer. He's tempted to return again the following night, but a shipmate encourages him not to bother, places like that have ways of keeping their money...

Exceptional Failure

On a roll of 12 roll 2d again, if the result is over the character's target number then a spectacular failure has occurred, and a penalty of some sort should be applied, such as extra time, a self inflicted injury etc.

E.g a character attempting a formidable lifting task STR=8 has a target number of 5 (Str 8-3 Formidable = 5) rolling 2d6 he rolls a 12, the referee asks him to roll a second time and he rolls an 8 this is above the target number of 5 so represents an exceptional failure. The referee informs the player that his character not only failed the task but managed to injure himself doing so and inflicts 1d6 wounds to the character's strength.

Zero Level (default) Skills

Characters attempting a default skill or action that does not require training make task rolls as normal (i.e. roll under the most appropriate characteristic for the task), though will be unable to reduce the task difficulty as they have no skill levels to allow this. Just like the main T4 rules the referee may also decide to reduce the character's characteristics by ½ for the purposes of the task.

Uncertain Tasks

As this system relies on 2 dice being rolled with modifiers for skill and conditions a player attempting an uncertain task should only be allowed to roll 1 die, with the referring rolling the second die in secret. The total of all die rolls and modifiers should not be announced, though truthful or misleading information/results can be given to the players as appropriate.

Example

Lt Commander Miranda Vishiga is a former criminologist seconded to the Imperial Navy (hence the officer rank) and now a naval interrogator, which in these troubled times is not a job she enjoys but does it for the good of the Imperium. Her Command fleet is in orbit above Aursis and she has been ordered to assist the Marine Force garrisoned at Shanira. One of the Patrols has captured a few suspected resistance members who claim to be innocent civilians though other evidence clearly puts them in the frame as insurgents. So far they've been treated civilly and asked to explain their actions, the result being that no reliable information has been forthcoming that can be used to either corroborate or refute their story.

Myranda's shuttle gracefully touches down on the roof of the Shanira HQ, the Marine Force Commander meets her and quickly leads her down into the makeshift cells whilst briefing her on the present situation. Myranda meets the insurgents, a motley collection of 4 human adults (two male, two female) ranging in age from 15 to 26 Imperial years. Her Marine guards are holding the suspects at gunpoint in a small windowless room with just a harsh looking table and a few chairs in it, the suspects each look very nervous, the youngest in particular looks like she's been crying, the groups demeanour is one of nervous tension, this can only work to Myranda's advantage.

Myranda decides that it will be best to conduct a preliminary interview and interrogate the females in the presence of the males. Biology is hard to fight and the men will quite naturally want to protect the women and be more likely to break.

Myranda is an expert at this type of manipulation (Interrogation Skill 4) though of slightly above average intelligence and education (8 each). Myranda decides that torture would be unethical given the age of the youngest suspect so decides that a group interview would be the most effective start to the process in this case.

Interrogations tend to be long drawn out processes that can go on for days or longer, she begins the interrogation picking on the youngest female, subjecting her to a barrage of harsh questions with the occasional nice comment thrown in to keep her off balance whilst the other suspects look on.

The referee decides that to determine the truthfulness of a group in these circumstances will be a formidable test of Interrogation Skill with the target number being 5 (Int 8 – 3 formidable = 5), however Miranda's expert skill level of 4 reduces this to an easy task with the target number being 10 (Int 8 +2 easy =10). The referee decides that this is an uncertain task and hides one of the dice rolled, Miranda's player rolls a 4 on 1D. Miranda's player knows that even if the secret die roll was less than a 6 then she would gain something of value from the interview and that even if the referee rolled a 6 exactly her task roll would still qualify her for partial success meaning that some good would have to come from the interview. Given her high attributes and expert skill usage, not to mention the relative ease of the interrogation she can be pretty certain that the information gained is reliable.

The referee explains that three of the four suspects have corroborating evidence which marks them as innocent civilians who just happened to be in the wrong place at the wrong time. The youngest however, has no such evidence to back up her story.

She gets up to leave the room, thanks the three oldest suspects for being cooperative and orders to marines to release them. As for the 15 year old girl, she orders that she be detained for another 24 hours just in case she can be of any further use.

Had Miranda's player rolled a 5 or 6 or even a 4 she would have been less certain of the truthfulness of the suspects claims.

Hasty Tasks and Leisurely Tasks

If characters are under pressure and need to complete things in a rush increase the task difficulty by 1 or 2 levels as appropriate prior to awarding time bonus, as a rule of thumb, half the time for each level increase as per the following table, exceptional successes can generate additional bonus time.

- 1 Level 50% time saved
- 2 Level 75% time saved
- 3 level 88% time saved.

Likewise if a character wants to do a slow steady but sure job of completing a task then multiply the time by 2 for each every level of difficulty decreased as a rule of thumb. Exceptional success can save time or impart some other bonus such as increased quality of construction if building or repairing items etc.

- 1 level time x 2
- 2 level time x 4
- 3 level time x 8

Cooperative and opposed tasks follow the rules as published on page 50 of the Traveller T4 Rule Book Exactly as do all other combat tasks.

What's good about the task Dynamic Task system.

For me at least this task system rewards highly skilled characters for investing heavily in their areas of expertise, whilst simultaneously allowing the attributes of characters to be taken into the task fully, and not divided by 3 or 4 or bonuses awarded if stats are greater than 7 or 8 etc. In other words Skills now represent how much knowledge you have, attributes represent how well you can apply that knowledge. Intuitively it makes perfect sense that an elderly surgeon with several levels of medical skill and a low dexterity can do a better job than a minimally trained medic (medical-1) with a high dex. Likewise, young cocky pilots might have the reflexes and the reactions to get them out of some sticky situations or close scrapes but will be unable to pull out of the type of thing that the more seasoned and skilled (though less reactive) pilot has learned to do over his or her long career.

I'd much rather be in the capable hands of a seasoned grav vehicle operator (grav vehicle-3) who has a dex of 6 than a character with a dex of 9 and a skill level of 1. The seasoned operator makes the formidable 'easy' whilst the less experienced pilot can only make the formidable 'difficult'.

Combat Damage.

If damage to attributes is applied immediately, to characteristics such as STR, DEX, END, as per the combat rules, then it can make the difference between life or death for the characters or even the success or failure of related tasks after the battle. You might have lots of skill and a great deal of knowledge but it's pretty hard to apply that knowledge or skill when you are in agony or have anything above superficial wounds. Which is how it should be, (try and lift that boulder off a crushed colleague when you've been shot through the shoulder!). "But I've got a strong character", splutters the player. "Yep, replies the referee, your character was strong before that last gun fight!".

What the task levels mean.

Put simply tasks are either easy, average, difficult, formidable, staggering or impossible from the point of view of a minimally trained average character. A minimally trained character is one with a single level of skill which will reduce the task difficulty. For the following example we've assumed the average character to be one with an attribute of 7 and a skill of 1.

The average character with 1 skill level and an attribute of 7 (high average) will succeed roughly 83% of the time for an easy(+2) task task. Average (-0) tasks will drop the likelihood of success to roughly 58%, whilst difficult(-2) tasks will see this fall to 28%, formidable tasks, really are formidable at 17% likelihood of success, whilst staggering and impossible tasks really are staggering and impossible at these levels having only a 9% and 3% chance of success (a direct roll of 2 on 2D) respectively. A character with higher attributes will perform better.

A single skill level should be seen as minimal competence whilst 2 or more levels really pay off in a big way. This fits in perfectly with the T4 character generation rules which awards more opportunities for skills at levels greater than 1 than most other D6 traveller versions, the implication being that more skills represent less focus and that a single level of a non combat skill represents 1 year of intense schooling.

It doesn't end at skills, individual attributes can be tested too (as given in the previous example about the boulder being lifted), a test of strength for lifting heavy objects or education to remember some meaningful news is applied in exactly the same way as an unskilled (default task) i.e just test the raw attribute, modified by task difficulty and even at ½ the characteristic (as per the main rules) if it seems appropriate.

What Skill Levels Mean Typical Experience Levels

Level 0 - No Training	- Default/Intuitive/Instinctual Use only
Level 1 - Minimally Trained	- Cadet/Rookie/Trainee etc
Level 2 - Competent	- Qualified Paramedic/Technician etc
Level 3 - Advanced	- Medical Doctor/Seasoned Veteran etc
Level 4 - Expert	- Specialist/Consultant/Elite Soldier
Level 5+ Increasingly Expert	- Increasing levels of Expertise

Probabilities of success for travellers characters (percentages rounded up) by task difficulty level with attributes ranging from 5 to 12

Attribute		5	6	7	8	9	A	B	C
Easy	(+2)	58%	73%	83%	92%	98%	100%	100%	100%
	(+1)	42%	58%	73%	83%	92%	98%	100%	100%
Average	(-0)	28%	42%	58%	73%	83%	92%	98%	100%
	(-1)	17%	28%	42%	58%	73%	83%	92%	98%
Difficult	(-2)	9%	17%	28%	42%	58%	73%	83%	92%
Formidable	(-3)	3%*	9%	17%	28%	42%	58%	73%	83%
Staggering	(-4)	3%*	3%*	9%	17%	28%	42%	58%	73%
Impossible	(-5)	3%*	3%*	3%*	9%	17%	28%	42%	58%
Hopeless	(-6)	3%*	3%*	3%*	3%*	9%	17%	28%	42%
	(-7)	3%*	3%*	3%*	3%*	3%*	9%	17%	28%
	(-8)	3%*	3%*	3%*	3%*	3%*	3%*	9%	17%

The Hopeless difficulty level isn't a standard difficulty for T4 characters but is included to allow compatibility with the BITS task system and to allow for increasing difficulties for 'Impossible' Tasks.

*Assuming that a 2 is directly rolled (auto success)

Referees may want to modify tasks making them easier or harder than typically stated, hence the entries on the table for -1,-3,-5 and -7 respectively. E.g. If you feel that an average task borders on the difficult then feel free to apply a -1 DM instead of the 0 adjustment for 'Average'.

Note where 100% is noted in the table a roll of 12 is always a failure and may lead to an exceptional failure.

Quick Maths

All probabilities were based on the following assumptions of success, though came out rather differently because it's all got to be done on 2d which as some players will sympathise doesn't give you the widest range of possibilities:

Task Level	Desired	Actual	Modifier
Easy	85%	83%	+2
Average	50%	58%	+0
Difficult	30%	28%	-2
Formidable	20%	17%	-3
Staggering	10%	9%	-4
Impossible	5%	3%	-5

As you can see this is not a design by feel system, though naturally some compromises have had to be made for the sake of the 2d rolls.

Classic Traveller System Usage

This system translates extremely well to the original Traveller rules, now called Classic Traveller (book 1) in which it was not possible for a character to start the game with any skills less than 1.

In order to use this system with the original classic traveller rules it is recommended that you completely drop the rules for advantageous or weakened strikes/swings etc as per book 1 page 45 as attributes are now their own positive or negative reward accordingly, hence no need for the +dm or -dm for tasks. However the weapon's armour and ranged matrix should be used unchanged from book 1 pages 46 and 47 and other sources such as mercenary book 4, thus fully taking into account the effects of range and armour. Consolidated Tables are reprinted here for ease of reference.

Weapon Type	Armour Types								Range Matrix					Wounds
Natural	None	Jack	Mesh	Cloth	Reflec	Ablat	Cbt	close	sht	med	long	V.long		
Hands	+1	-1	-4	-4	0	-1	-6	+2	+1	No	No	No	1D	
Claws	+3	0	0	+1	-1	-3	-7	+1	+2	No	No	No	1D	
Teeth	+2	+1	-1	0	-2	-4	-7	+2	0	No	No	No	2D	
Horns	+2	+1	0	-1	+2	-2	-5	-1	+1	No	No	No	2D	
Hooves	+3	+3	+2	+2	+3	+2	-6	-1	+2	No	No	No	2D	
Stinger	+4	+3	0	+1	+2	+0	-6	+4	+2	No	No	No	3D	
Thrasher	+7	+7	+4	+4	+7	+4	0	+5	+1	No	No	No	2D	
Club	0	0	-2	-3	0	-2	-7	+1	+2	No	No	No	2D	
Blade Weapons	None	Jack	Mesh	Cloth	Reflec	Ablat	Cbt	Close	Sht	Med	Long	V.long	Wounds	
Dagger	0	-1	-4	-4	0	-2	-5	+1	-1	No	No	No	2D	
Blade	+1	0	-4	-4	+1	-3	-5	+1	+1	No	No	No	2D	
Foil	+2	0	-4	-3	+2	-2	-8	-1	0	No	No	No	1D	
Cutlass	+4	+3	-2	-3	+4	-2	-6	-4	+2	No	No	No	2D	
Sword	+3	+3	-3	-3	+3	-2	-6	-2	+1	No	No	No	2D	
Broadsword	+5	+5	+1	0	+5	+1	-4	-8	+3	No	No	No	4D	
Melee Weapons	None	Jack	Mesh	Cloth	Reflec	Ablat	Cbt	Close	Sht	Med	Long	V.Long	Wounds	
Bayonet	+2	+1	0	-1	+2	-2	-6	-1	+2	No	No	No	3D	
Spear	+1	0	-2	-2	-1	-3	-6	-2	+1	No	No	No	2D	
Halberd	+4	+3	-2	-3	+4	-2	-5	0	+1	No	No	No	3D	
Pike	+1	0	-2	-2	-1	-3	-6	-4	+4	No	No	No	3D	
Cudgel	0	0	-2	-3	0	-2	-7	0	0	No	No	No	2D	
Slug Throwers	None	Jack	Mesh	Cloth	Reflec	Ablat	Cbt	Close	Sht	Med	Long	V.Long	Wounds	
Accelerator Rifle	+3/+4	+3/+4	0/+1	-2/-1	+3/+4	+1/-2	-5/-4	-8/-8	-6/-6	+2/+4	+1/+2	No	3D	
Adv.Comb.Rifle DS	+3/+5	+3/+5	0/+3	-2/0	+3/+5	+1/+5	-3/-1	-4/-4	+1/+1	0/+2	-1/+1	-2/0	3D	
Adv.Comb.Rifle HE	+2/+4	+2/+4	0/+2	-3/-1	+2/+4	+2/+4	-4/-3	-4	+1	-1/+1	-2/0	-4/-2	4D	
Assault Rifle	+2/+4	+2/+4	-1/+2	-3/-1	+2/+4	0/+2	-5/-4	-4/-4	+1/+1	-1/+2	-2/0	-4/-3	3D	
Auto Cannon DS	+6	+6	+6	+6	+6	+6	+4	No	No	+6	+4	+2	6D	
Auto Cannon HE	+6	+6	+6	+6	+6	+6	+2	No	No	+6	+4	+2	8D	
Auto Rifle	+6	+6	+2	-1	+6	+3	-5	-8	0	+2	+1	-2	3D	
Auto Pistol	+1	+1	-1	-3	+1	-1	-5	+1	+2	-4	-6	No	3D	
Body Pistol	0	0	-2	-4	-4	-2	-7	+2	+1	-6	No	No	3D	
Carbine	+2	+2	0	-3	+2	-1	-5	-4	+1	-2	-4	-5	3D	
Revolver	+1	+1	-1	-3	+1	-1	-5	+1	+2	-3	-5	No	3D	
Rifle	+3	+3	0	-2	+3	+1	-4	-4	+1	0	-1	-3	3D	
Gauss Rifle	+4/+7	+4/+7	+2/+5	+1/+3	+4/+7	+4/+7	-2/0	-4/-4	+1/+1	+2/+4	+3/+5	0/+1	4D	
Lt Assault Gun DS	+3	+3	+2	+1	+3	+3	+0	-8	0	+2	+1	-2	4D	
Lt Assault Gun HE	+3	+3	0	-2	+3	+1	-4	-4	+1	+1	0	-1	4D	
Lt Assault Gun Flec	+5	+5	0	-3	+5	+2	-5	-4	+1	+3	+2	-1	2D	
LMG	+6	+6	+2	-1	+6	+3	-3	No	-6	+4	+2	0	3D	
Shotgun	+5	+5	-1	-3	+5	+2	-5	-8	+1	+3	-6	No	4D	
Snub Pistol HE	+2	+2	-1	-3	+2	0	-8	No	+2	-8	No	No	4D	
Snub Pistol HEAP	+2	+2	+1	-1	+3	+2	-3	+1	+2	-8	No	No	4D	
Snub Pistol Tranq	-1	-1	-4	-6	-1	-4	No	+1	+2	-8	No	No	Variable	
Submachinegun	+5	+5	0	-3	+5	+2	-4	-4	+3	+3	-6	-9	3D	
VRF Gauss Gun	+7	+7	+7	+7	+7	+7	+5	No	No	+8	+5	+2	10D	
Energy Weapons	None	Jack	Mesh	Cloth	Reflec	Ablat	Cbt	Close	Sht	Med	Long	V.Long	Wounds	
Laser Pistol	+1	+1	0	0	-8	-7	-6	+1	+2	-3	-5	No	3D *	
Laser Carbine	+2	+2	+1	+1	-8	-7	-6	-2	+1	+1	+1	0	4D	
Laser Rifle	+3	+3	+2	+2	-8	-7	-6	-4	+2	+2	+2	+1	5D	
PGMP-12	+2	+2	+2	+1	+2	+2	0	No	No	+2	+1	0	10D	
PGMP-13	+4	+4	+4	+4	+4	+4	+1	No	No	+3	+3	+2	12D	
FGMP-14	+4	+4	+4	+4	+4	+4	+3	No	No	+4	+3	+3	16D	
RAM Grenades	None	Jack	Mesh	Cloth	Reflec	Ablat	Cbt	Close	Sht	Med	Long	V.Long	Wounds	
4 cm HE	+4/+6	+4/+6	+2/+4	+1/+3	+4/+6	+4/+6	-2/0	No	No	+3/+6	+2/+6	-4/+1	8D	
4 cm Flechette	+7/+9	+7/+9	+3/+5	-2/0	+7/+9	+3/+5	-6/-4	No	No	+3/+6	+2/+5	-4/0	3D	
4 cm HEAP	+2/+4	+2/+4	+2/+4	+2/+4	+2/+4	+2/+4	0/+2	No	No	+2/+4	0/+2	-6/-4	8D	
Additions	None	Jack	Mesh	Cloth	Reflec	Ablat	Cbt	Close	Sht	Med	Long	V.Long	Wounds	
Telescopic Sights											+4	+4		
Electronic Sights											+4	+4		
Shoulder Stock								-1	-1	+1	+1			
Folding Stock										-1	-1	-1		

*does not exist in books 1 to 8 but added here unofficially for completeness.

Some weapons are capable of automatic or burst fire, increasing the likelihood of a successful hit, where this is the case values are separated by a slash, e.g. +3/+4. The value before the slash represents single shot modifiers, the value after the slash represents full automatic or burst fire. For further details please reference the appropriate combat rules in Book 1 and Book 4 Mercenary.

Just like the T4 examples give previously, task difficulty for combat in Classic Traveller is based on range. Of course the referee can and is encouraged to modify task difficulty should he or she decide that circumstances warrant it, such as extreme environmental conditions or other factors that would make combat more difficult, e.g. Hand to hand combat in a cramped space or even easier.

Classic Traveller combat range bands differ significantly from those used in T4 so the following table derived from Page 32 Traveller Book 1 - Characters and Combat should be used.

Range	Descriptor	Range in Meters	Task Difficulty	DM
Close	Physical Contact, Touching	0m	Easy	+1 or +2
Short	At Sword or Polearm Point	1-5m	Average	+0
Medium	At Pistol Range	6-50m	Difficult	-2
Long	At Rifle Range	51-250m	Formidable	-3
Very Long	Extreme Range	251-500m	Staggering	-4
Distant	Distant Range	500m-5Km	Impossible	-5

Example: Chant Logon is enjoying a drink in a bar on Aursis, being an off-worlder he is not particularly popular even though as a merchant he has very little to do with the invading Imperial forces. One person who seems to like him and is sensible enough to put aside the heightened tensions of the present conflict and focus on making some money is Dayl Hansk. Chant sighs inwardly after checking the local time on his wrist comm. Dayl Hansk, his broker contact hasn't showed up, which probably means that his chances of landing a nice fat, lucrative trade contract has fell though the floor. Paying the ship's mortgage and crew salaries would be a hell of lot easier had it come through. Not to worry though, he'll make some enquiries in the morning and find out what's happened.

He is armed with an autopistol and has a skill level of 1, his dex is 6.

When leaving the bar and walking back to the starport the quiet air is shattered by the crack of pistol fire, a chunk of masonry shatters alongside him. Instinctively he leaps into a doorway, hoping it will give him some cover. Ducking down he draws his autopistol and tries to check out the area. He hears the scuffle of someone running towards him, having no choice he steps out of the doorway with his pistol ready, only to see a man running towards the parked ground cars that are partially shielding him. His assailant raises his revolver from medium range. Chant Fires, The referee deems this to be an difficult task of his autopistol/handgun skill. Chant's skill level of handgun-1 means that the task difficulty is reduced one level to average.

The insurgent has no armour (+1) and is at medium range (-4), the task being 'average' means an additional -2 to the roll. His target number is now 3 (Dex 6, +1 no armour, -4 Short Range. Chant's player rolls 11 on 2 dice). He looks up into the face of his assailant, only to see his contact Dayl Hansk. Momentarily stunned by the sight of such a hitherto friendly man trying to kill him he fires, sending his shot wide. His contact flinches and darts behind a parked ground car for cover.

As noted, combat tasks as given in Book 1 represent combat in ordinary conditions, had the combat took place in the midst of a blizzard making things even harder then the referee would have been justified in making the task 'difficult' or formidable and applying a -2 or -3 penalty to the roll. Likewise had Chant's assailant turned and attempted to run away at medium range when chant fired his pistol, then the referee may consider making the combat task 'Easy' and awarding a bonus of +1 or +2 to the roll accordingly. As always common sense and circumstances should win out.

Dayl Hansk, has just flung himself behind a parked ground car, furious and scared he hadn't expected the Impie spy to be armed, just goes to show, he's really no merchant he thought to himself as he cocked his revolver. He should have just fired when he had the chance but his instincts overpowered his thinking and before he knew it he found himself to be hiding behind the car. Lowering himself to the ground, he decides he's going to look out from under the car and fire at the spy's feet or legs, perhaps he can regain the advantage if he can disable to Imperial Scum bag. 'It's ok' he shouts to the Imperial, 'I didn't realise it was you', in an attempt to buy time. He crawls partially under the vehicle's sill, face down he looks across to the Impie's last known position. The air is totally silent as the Impie refuses to answer, worryingly Dayl can't see any sign of the man's legs or feet, perhaps one of the front wheels is in the way. This is getting worse and worse...

Suddenly the car rocks, with the weight of Chant Logon leaping onto it, pistol ready he fires down at the prone man. This shot is at short range, and ordinarily an average combat task, Chant's target number is 9, (dex 6 +1 no armour, +2 short range), as noted his skill level of 1 further reduces the task difficulty to Easy giving him an additional bonus. Due to the fact that his assailant is prone on the ground making him slower to move and the range effectively borders on close the referee decides that this should warrant the full +2 bonus, raising the target number to 11. Chant's player rolls 11 on 2 dice, Chant's rotten luck had almost finished him, but it's a hit, his player rolls 3D weapon damage and delivers 6 points of damage to Dayl, sending a bullet through the back of the grounded man's left shoulder. The pain forces him to release his revolver. Chant jumps from the car to land directly on top of Dayl, wounding him further. Grabbing the wounded mans injured shoulder (an easy unarmed combat task) he applies pressure to it causing even more pain, forcing Dayl to scream out. 'Quickly hisses Chant, you'd better not try anything. Now I want some answers...'



The 4 Corners

The 4 Corners

The year is 1105, the Third Imperium has remained true to its founding principles, being the greatest and most stable civilisation in human history. A bastion of free market principles the Imperium remains prosperous, whilst tentatively exploring the far reaches of scientific endeavour, no more so than in the Imperial Core.

One such region of the Imperial Core is known informally by its citizens as the 4 Corners, a region of space where the 4 sectors of Massila, Core Sector, Zarushagar and Dagudashaag meet in a mish-mash of cultures and races. Whilst there are several '4 corners' regions within the Empire, this area is especially notable being home to the Imperial world of Reference (0140 Core Sector), being the star system which all Imperial maps are centred upon (and home to the Imperial Cartographic Office), making this region the one that is most often thought of when someone mentions 'the four corners'...

The four corners have been at peace for centuries and whilst individual worlds and corporations fight the same old battles that they've always fought, such small scale warfare and economic positioning pales into insignificance when compared to the rarely considered threats found on the frontier...

The Frontier wars with the Spinward Zhodani, the actions of Vargr raiders to Coreward, the trailing threat of the belligerent K'kree and the smouldering tensions along the Solomani Rim are merely interesting news stories to the average citizen of the Core. The core is at peace, or so it would seem...

Economic power and personal wealth mean everything in the core, Mega-Corporations jockey for position and influence with key members of the nobility. The Imperial moot is merely a few subsectors away lending an air of power, security and authority to the region. The ideal conditions for intrigue, corruption and adventure.

About The Region

Being old established sectors, technology levels are as you would expect high, pre-industrial worlds are rare and scientific breakthroughs are being made every day, many worlds claim the prestigious right to be called 'Tech 16' due to advances in medical, engineering and computer sciences. Thus virtually every world of the region can trade for high tech (expensive) devices and information.

Science

Amongst the scientific institutes of the 4 corners region the air is tense with excitement, each day the X-boat network brings more news of steady breakthroughs in computer sciences, robotics, anti-matter containment and more. Meanwhile dedicated physicists in their lab ship's continue to probe the mysteries of jump space, whether its making drives less energy reliant or more fuel efficient or even the much speculated upon notion of breaking the Jump 6 barrier. Whilst none of these things have yet happened a small band of researchers scattered across many worlds believe it's possible, which is enough for Imperial authorities to invest heavily in their work. Research grants are abundant, archaeologists pick through the ruins of ancient civilisations, both human and alien and further refine the window into the past we call history. This climate of scientific speculation is enough to keep many luxury Yacht owners permanently in the black as foundations and teams charter their vessels for the next big discovery. Lab Ship owners have also never been so busy providing practical help to optimistic teams of happy scientists.

Xeno-Biology

One such field of endeavour is in the study of alien life forms and their respective eco systems, many worlds have low populations and whilst technologically progressive many populations try to live in harmony with the native flora and fauna hence the preponderance of game reserves and areas of 'outstanding natural beauty'. Needless to say this attracts tourists, big game hunters and poachers where hunting is not allowed.

Many other worlds in the region are the end result of First Imperium terraforming attempts and Second Imperium Solomani interference and 'research'. These worlds have a variety non indigenous species that have either adapted or been genetically altered to make the most of the environmental conditions around them. Where these artificial eco-systems have become stressed and are in danger of collapsing the work of big game hunters and conservationists becomes exceptionally important. Hunters are usually hired to organise culls of over-bred animal populations, sometimes alongside conservationists protecting displaced or threatened species. Most worlds that have naturally evolved indigenous life have strong controls regarding the free movement of non indigenous species both around, on and off world (and in some case sophonts).

Mercenary

One such trade that never seems to go out of business is that of the soldier for hire, being a 'civilised' region most worlds respect the value of a repatriation bond, making wars 'good' from the mercenary point of view. Warfare never goes out of fashion, low population worlds with important resources still feel the need to defend them from those who would take them from them. When economics fails, most disputes get settled by the use of overwhelming brute force, political sanctions or a combination of the two.

Thus Mercenary cruisers and units of all shapes, sizes and specialities cruise the space ways on to their next big kill and even bigger payout.

Merchants

With economic success comes shipping, with many high population worlds and economic powerhouses there will always be those who sensing weakness and complacency will take advantage and raid merchant shipping, sometimes desperate captains and ship crews will be opportunistic raiders, other times, full fledged pirates, privateers and corsairs will make a killing even here in the heart of the Imperium. Whilst not as common as on or beyond the Empire's borders small scale acts of discreet piracy still occur. Thus Imperial Navy warships and system defence craft are ever vigilant and always on the lookout for suspicious shipping activity.

Much more common than piracy is smuggling, whether its illegal goods, pharmaceuticals, technology, animals or people such as refugees or unauthorised migrants, it unquestionably takes place and can be extremely lucrative.

Scouts

A common misconception is that everything that there is know about a given core system can probably be looked up in a library program and that everything that there is to see has probably been mapped, scanned, analysed and collated many years ago. Whilst this may be true of busy, populous systems, this is not true of all systems. Many maps of rarely visited out system worlds are centuries out of date and often need updating. This is particularly true of older geological surveys made with primitive densitometers that did not have the ability to penetrate planetary crusts as deeply as their more modern counterparts.

Criminals

Where there's laws there are also those who are prepared to break them, usually for financial or political advantage. Hence law enforcers and investigative agents are in huge demand amongst the more populated worlds of the core. Some laws are fair, others clearly not! Criminals often portray themselves as freedom fighter or political activists and as their careers evolve genuinely become so. Also the opposite is true, freedom fighters and activists are more criminals and deemed terrorists by the governments they oppose. As such there is a huge black market in illegal weapons and people trafficking throughout the more troubled worlds of the core. Piracy still occurs, though usually with more subtlety than is often portrayed in the Imperial media and smuggling is rife.

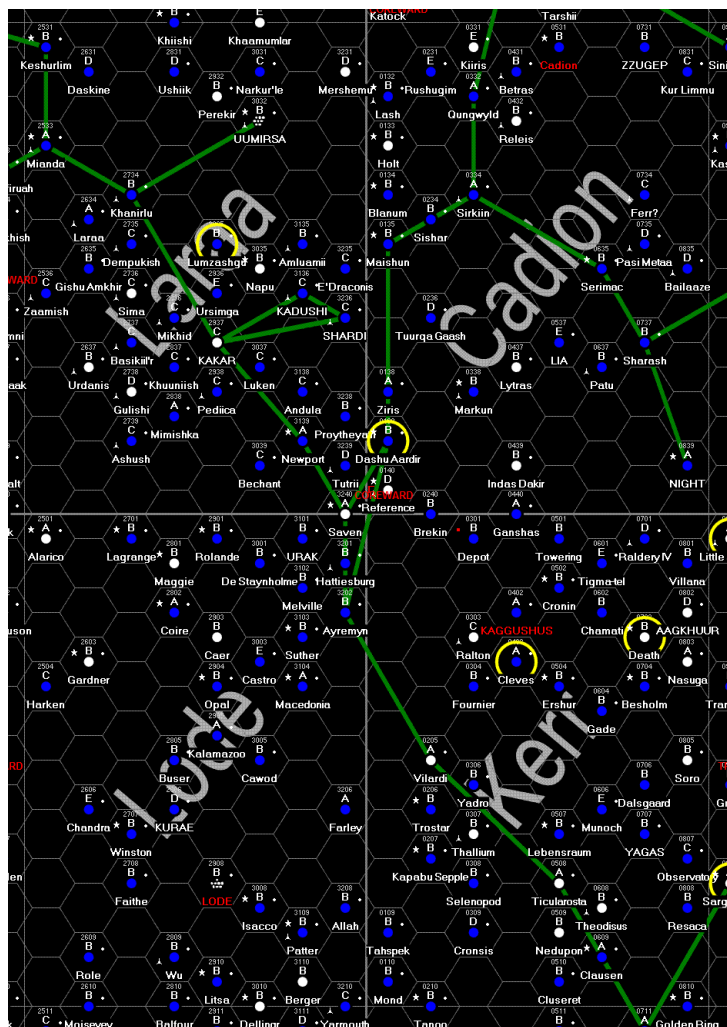
Megacorporations

Megacorporations are practically states within states and often conduct hot and cold wars with their rivals, as long as this doesn't impact Imperial shipping the Emperor doesn't mind... Competition is good for business, sometimes that competition costs lives, livelihoods and often entire star systems. Though when Megacorporations 'compete' people very rarely go to jail and often end their days exceptionally rich!

Clandestine Services

Knowledge is power, and sometimes the only way to get that knowledge is to hire an expert, either a sole investigator or an entire intelligence agency that will spy on your friends, allies or enemies for a fee. Individuals with a background in intelligence work or investigative services such as undercover law enforcement or corporate 'claims assessors' will find a great deal of work in such an environment as the Imperial Core, either conducting the intelligence or training others to do so.

4 Corners Region of the Imperial Core



<h1>Laraa</h1> <p>Dagudashag Sector</p>	<h1>Cadion</h1> <p>Core Sector</p>
<h1>Lode</h1> <p>Zarushagar Sector</p>	<h1>Kerr</h1> <p>Massillia Sector</p>

Cartography

The 4 corners region is made up of the 4 subsectors of Laraa, Cadion, Lode and Kerr respectively.

Laraa being Subsector P of Dagudashag Sector.

Cadion Being Subsector M of the Core Sector.

Lode being Subsector D of Zarushagar Sector

Kerr Being Subsector A of Massilla Sector.

They have a combined population of 255.6 Billion Inhabitants and is an economic powerhouse when compared to other regions of the Imperium..

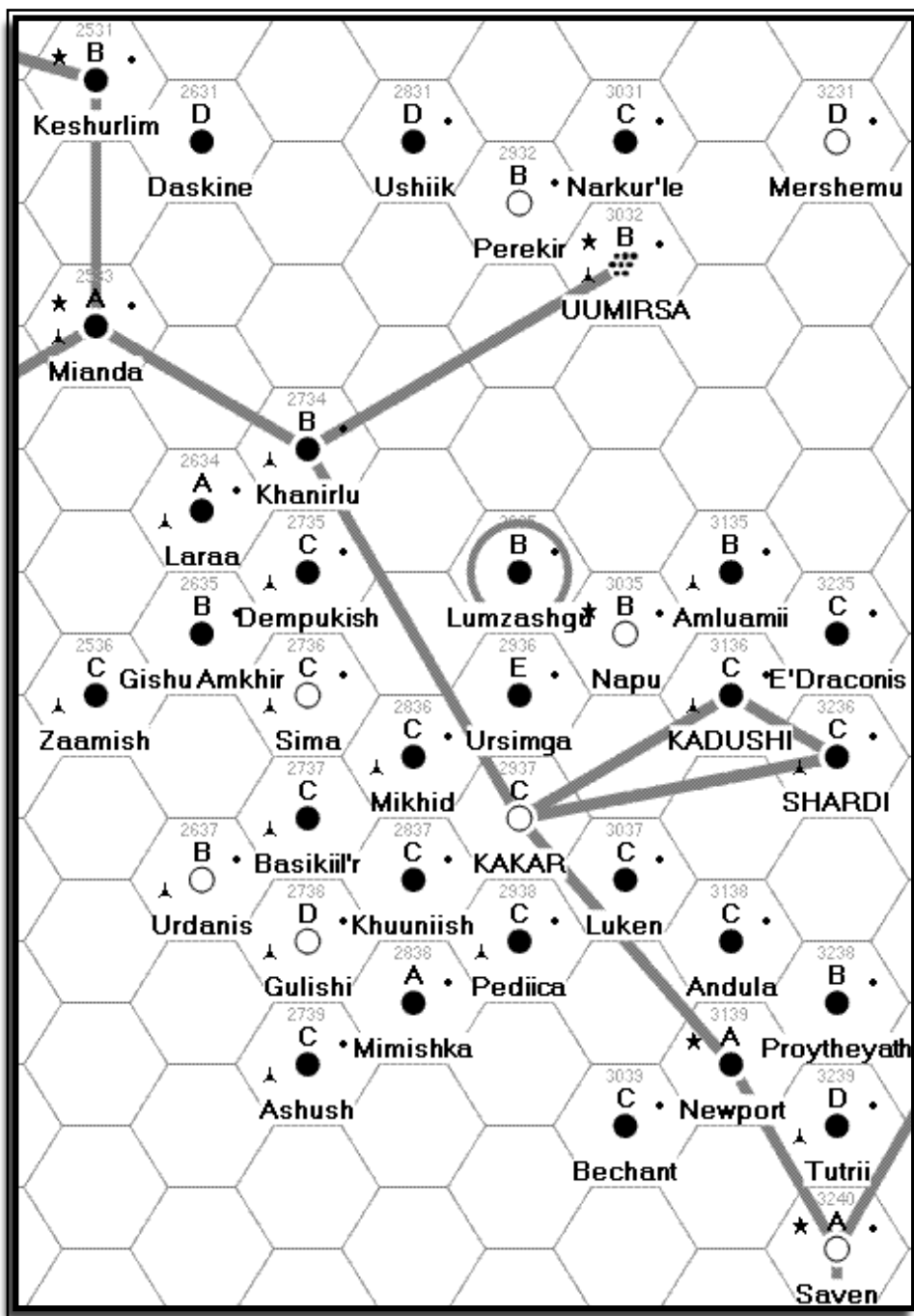
The Laraa subsector contains 37 worlds with a population of 78.7 billion. The highest population is 60 billion, at Shardi. The highest tech level is F at Kakar, Uumirsa, Newport and Saven.

The Cadion subsector contains 31 worlds with a population of 13.6 billion. The highest population is 7 billion, at Lia. The highest tech level is F at Night.

The Lode subsector contains 37 worlds with a population of 18.3 billion. The highest population is 7 billion, at Kurae. The highest tech level is F at Alarico and Farley.

The Kerr subsector contains 40 worlds with a population of 145 billion. The highest population is 90 billion, at Kaggushus. The highest tech level is F at Kaggushus and Ticularosta.

The Laraa Subsector *Subsector P of Dagudashag*



Shardi (3236)

A, small, thin atmosphere, high population industrial world orbiting a red main sequence star. Shardi is headed by a religious dictatorship that rigidly controls its populace both on Shardi and across the solar system at its numerous and expansive colonial sites.

Its high tech level coupled with its massive population of sixty billion makes the cost of its labour cheap, as there are more people than jobs. The industrial output of Shardi has been swelled by off world investment, tempted to what is ultimately a miserable and depressing place to live with the promise of cheap labour. On Shardi all men are automatically members of the church whilst their wives and children are not. The church is involved in almost every industry on Shardi and appoints managers and overseers from within its ranks in a system not too dissimilar from some of the feudal technocracies found within the Imperium.

Law enforcement is a branch of the army, with each senior officer being a church 'commander. 'The Divine Constabulary' or 'Dee Cee's' as they are informally called, enforce religious law first and foremost and civil law second. Curfews exist and the population is heavily spied upon. Keeping such a paranoid government in its place requires a top heavy bureaucracy and a large intelligence service on the look out for the few 'real' dissident groups that seek to end this autocratic and highly controlling form of government on Shardi. In contrast to the many 'imagined' threats reported as fact by government agencies across the System's news net.

The media on Shardi is also tightly controlled, featuring religious programmes and state sanctioned entertainments.

Imported holo-shows are carefully screened and censored prior to approval for viewing lest they contaminate the populace with their 'unclean' ideas or inappropriate morality. Visiting entertainers and celebrities or other notable sophonts are equally as thoroughly investigated and approved prior to being granted access to the mainstream populace either at the Starport or any of its subsidiary ports

Ursimga 2936

A Rich low tech world orbiting a red main sequence star. Ursimga is famous for its wholesome agricultural output and reticence to technology. Often portrayed as a world full of backward looking and introspective 'serfs' by many media outlets on neighbouring worlds, nothing could be further from the truth. Its population of 10,000,000 farmers and ranchers share a common philosophy of self reliance and living in harmony with the planet. Thus any devices that can't be fixed with mechanical tools or by hand are frowned upon by the inhabitants, making this world a poor market for high tech goods. Electronic goods or machinery that needs electronic parts often can't be fixed locally when they breakdown which is a very important consideration when thin populations of farmers and homesteaders can be separated by thousands of kilometers.

Most families have copious amounts of land and only farm to feed themselves, standards of living are fairly high and laws are relaxed as they are generally only needed where people live in large urban areas which do not exist on Ursimga. Excess agricultural produce are sold by farms near to the Starport hence the off world 'Agricultural' Trade classification. There's been an increasing demand for Ursimgan foodstuffs in recent years many of which are considered to be delicacies elsewhere. Ursimga has naturally spawned life, much of which is semi-intelligent and carbon based. Plant life is varied and interesting and mostly black or dark leafed, to make the most of the light and heat from the system's primary star. Ursimga is a recently settled world having formerly been an imperial preserve and interdicted by the scouts of most of the Imperium's history. This ban was lifted in the year 990 IE allowing colonisation to take place. When it was determined that some of the more highly evolved species were merely semi-intelligent animals and whilst they exhibited a type of primitive culture and communal forms of living, this behaviour had more to do with instinct as opposed to intelligence.

Ursimgan Mirror Wood

A curiosity of Laraa subsector is the Ursimgan Mirror Tree. In stark contrast to the vast majority of plant life on Ursimga this tree is not dark in appearance, but exceptionally shiny, both in bark, leaves and its wood. Ursimgan Mirror Wood is prized on many nearby Imperial worlds because of its natural reflective properties.

The Laraa Subsector of Dagudashag

Name	Hex	UWP	Base	Codes	Zone	PBG	Alleg	Stellar Data
Keshurlim	2531	B527467-D	N	Ni		704	Im	M2 V
Mianda	2533	A552441-D	A	Ni Po		924	Im	M2 V M8 D
Zaamish	2536	C897610-B	S	Ni FI		313	Im	K4 D
Daskine	2631	D742575-4		Ni Po		300	Im	G7 III
Laraa	2634	A527411-C	S	C0 Ni		102	Im	M8 III
Gishu Amkhir	2635	B552566-8		Ni Po		614	Im	M3 V M9 V
Urdanis	2637	B6107CC-B	S	C0 Na		922	Im	M3 V M8 D
Khanirlu	2734	B547773-C	S	Ag		602	Im	M3 VI M6 D
Dempukish	2735	C99A327-7	S	Lo Ni Wa		903	Im	M2 V
Sima	2736	C9D6574-9	S	Ni FI		904	Im	M0 V M9 D
Basikiil'r	2737	C894553-B	S	Ag Ni		200	Im	A2 III K1 D
Gulishi	2738	D203212-8	S	Lo Ni Va Ic		712	Im	K3 V M4 D
Ashush	2739	C645441-B	S	Ni		803	Im	M3 V K2 D
Ushiik	2831	D768774-3		Ag Ri		303	Im	M0 V
Mikhid	2836	C777200-B	S	Lo Ni		503	Im	M8 V
Khuuniish	2837	C382300-C		Lo Ni		505	Im	K9 II M8 VI
Mimishka	2838	A543156-B		Lo Ni Po		723	Im	G9 V
Perekir	2932	B210634-9		Na Ni		403	Im	M3 V
Lumzashgu	2935	B788885-C		Ri	A	103	Im	K2 V
Ursimga	2936	E687742-4		Ag Ri		103	Im	M2 V
Kakar	2937	C1009CB-F		Hi Na In Va		630	Im	M0 V M5 D
Pediica	2938	C758121-A	S	Lo Ni		603	Im	K9 V M5 D
Narkur'le	3031	C85A686-9		Ni Wa		201	Im	G1 V
Uumirsa	3032	B000954-F	A	Hi Na In As		404	Im	K2 V
Napu	3035	B8B5202-C	N	Lo Ni FI		603	Im	G1 III
Luken	3037	C543589-B		Ni Po		103	Im	K2 V
Bechant	3039	C371367-A		Lo Ni		211	Im	K1 V
Amluamii	3135	B245525-9	S	Ag Ni		104	Im	G0 V
Kadushi	3136	C8899A7-C	S	Hi		804	Im	M3 V
Andula	3138	C542468-8		Ni Po		121	Im	G4 V
Newport	3139	A433204-F	N	Lo Ni Po		103	Im	G8 V
Mershemu	3231	D580411-8		Ni De		903	Im	G2 V
E'Draconis	3235	C594550-7		Ag Ni		903	Im	M1 III M5 D
Shardi	3236	C326ADB-E	S	Hi In		604	Im	M0 V
Proytheyath	3238	B458831-8		D3		313	Im	K1 V M5 D
Tutrii	3239	DA7A266-8	S	Lo Ni Wa		102	Im	G9 V M4 D
Saven	3240	A5A0734-F	N	De		613	Im	G2 IV

The Laraa subsector contains 37 worlds with a population of 78.7 billion. The highest population is 60 billion, at Shardi. The highest tech level is F at Kakar, Uumirsa, Newport and Saven.

Ashush 2739

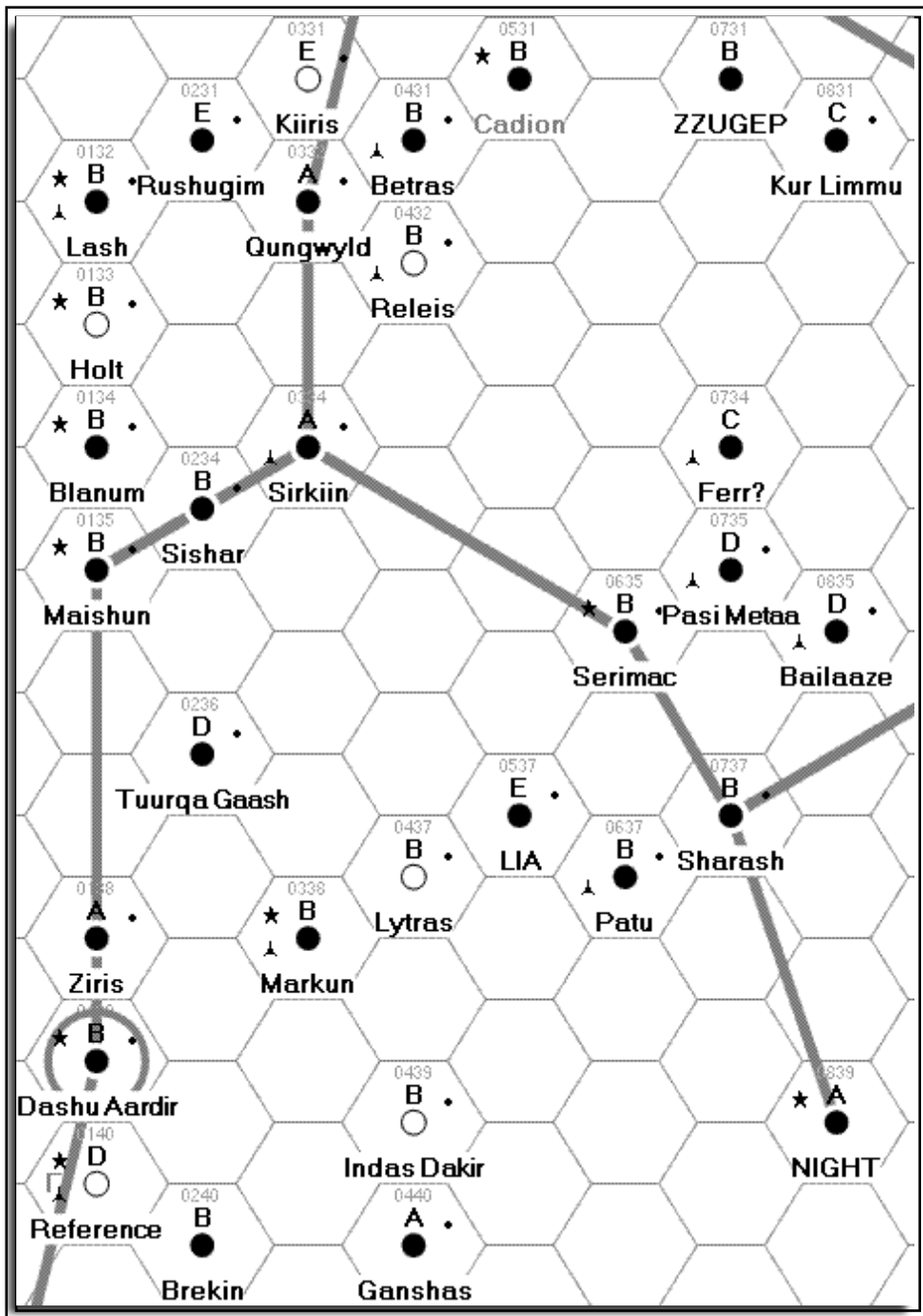
80,000 people call the world of Ashush their home, originally founded by a small cult of religious zealots 'The Church of the Divine Influence'. The world of Ashush is a cold hell hole orbiting in what is optimistically called the 'habitable zone' of Kankush its parent star. Some surface water at the equator is occasionally liquid in one of the several 'summer periods' that occur throughout it's orbit though for the most part it is usually ice.

The summer/winter cycle is caused by the coronal disturbances of Sansush (the dwarf companion star) which orbits exceptionally close to Kankush in an elliptical orbit that is so close in fact that the coronas of the two stars repeatedly meet and flare into one several times a year, dazzling the inner system with their combined red-orange brightness and warmth. These interactions last for 6 to 8 weeks and are sufficiently powerful that the surface ice on Ashush melts at the equator and the planet enjoys a period of relative warmth. Such erratic orbits also result in predictable 'quake seasons'. The eddying gravitational attractions of both stars cause tidal effects in the surface ice and frozen oceans in addition to increased geological activity. Such mantle flexing has served to keep the planet's core warmer than it would ordinarily be and contributes greatly to surface temperatures. Sylean engineers originally seeded the then lifeless and inhospitable Ashush with oxygen producing bacteria that had been genetically altered to thrive in the deep oceans alongside undersea vents and volcanoes. The atmospheric content has slowly increased in the thousand or so years since the Sylean Federation became the Third Imperium and whilst thin can be breathed without a compressor mask at low altitudes. The air on Ashush does smell however, carbon compounds, methane from the bacteria, simple life processes and extra-biological contamination (from visitors) has combined with volcanic sulphur to make for a rank stink guaranteed to upset anyone not used to it.

The original religious founding fathers saw very little need for codified laws as such but went to great lengths to indoctrinate their followers with many social rituals, rites of passage and codified forms of behaviour that serve their society well in place of laws. This has the unfortunate side effect of making the locals very difficult to deal with as all forms of interaction must take place with an appropriate and socially acceptable ritual.

The government is headed by the Council of Ministers, made up of 5 high ranking priests or priestesses directly elected by the population to govern. A small but efficient bureaucracy oversees day to day governmental tasks. A small scout base is present at the port that in addition to the usual duties attached to such a base directly observes the coronal activities of both stars and provides warnings if flares may be particularly life threatening. If travellers can't stand the local ways they can often find rest and good company at the base which has some publicly accessible areas.

The Cadion Subsector *Subsector M of Core*



Night Wave Entertainments Lic, is a large Imperial company based on Night 0839 A5749C9-F that specialised in providing the very best in both live and pre-recorded entertainments, shipping both electronic transmissions and holocrystal media throughout the core. Night Wave Entertainments has made many a talented entertainer into a mega-star with leagues of adoring fans and 'stalkers' across the Imperium. Night Wave also sponsors live performances and artistic works, wholeheartedly subscribing to the ideal that a civilisation is judged by it's artistic works.

Night Wave studios make high quality Holo-drama and interactive movies in which the audience (if they choose to do so) can affect the outcome of the plot, as well as producing outstanding factual programmes from the most interesting places in the core, bringing the viewer or audience into the presence of the most interesting sophonts.

Night Wave is always on the look out for ex military personnel to serve as bodyguards and security experts for its many 'stars' that are based on local offices across the four corners region. Assignments with Night Wave always pay well and usually work out as planned. Recently Night Wave has started purchasing new build M Class Liners and Yachts to ship a celebrity and his or her retinue on their tours across the region in the lap of luxury. Such Tours tend to last 6 months to a year and are good work for ex-military types, if they can put up with the tempers and artistic pandering that is required by some of the bigger stars.

Night Wave Talent Scouts usually have the use of scout/courier class vessels and small merchants to take them from world to world seeking out the best and brightest entertainers that are wishing to make a name for themselves. Such vessels are quite luxuriously appointed as 'image is everything' when signing up a worthy act and with Night Wave first impressions really do count.

Night 0839

Night is an excellent example of what a mainstream Imperial world should be. At the cutting edge of technology, this medium sized, tainted atmosphered world is home to 3 billion inhabitants that are generally happy with their standards of living and their government. The government is simply known as the 'Bureau' and manages to provide good quality services for its people and visitors without being too intrusive in daily life or overburdening the populace with heavy taxes or too many restrictive laws. Generally people are free to do as they please provided it doesn't negatively affect any other sophonts. Weapons outside the home are prohibited.

Night is so called because it's tidally locked with one side of the world permanently facing its parent star and the other in permanent darkness, most citizens live in large urban arcologies in the twilight region, where warm winds flow freely over the surface from the hot to the cold side and vice versa in the form of permanent convection currents. Much of this wind energy is harnessed by turbines for electrical power as it's consistent and predictable. Whilst some hardy forms of indigenous and imported life do exist both on the warm and dark side of the planet, most live in the temperate zone where the hot and cold airstreams meet and turn into precipitation. Thunderstorms are common and exceptionally violent, as are cyclones, hurricanes and tornados that are often dangerous enough to cancel all flights to and from the surface. Logistically Night is a good location for the Imperial Navy that maintain a base attached to the Rubistar orbital facility that sits in geosynchronous orbit above Rubistar downport. The navy make good use of the excellent ship handling and construction/repair facilities here and contribute greatly to this world's wealth. Many companies based on night, supply specialist parts and equipment to the Navy or undertake cutting edge weapons and sensor research. The Marines also make good use of the many and varied environmental conditions on night as an excellent training ground to prepare their troops for the widest range of conditions, from the baking heat of the relentless sun on the day side to the bleak ice wastes of the dark side, that are lit only by starlight. Indeed vast uninhabited expanses of the planet are frequently used for live exercises and assault training, including the tropical and temperate zones of the twilight region.

The Cadion Subsector Subsector M of Core Sector

Name	Hex	UWP	Base	Codes	Zone	PBG	Alleg	Stellar Data
Lash	0132	B76A200-E	A	Lo Ni Wa		521	Im	K3 V M0 D
Holt	0133	B8D7346-C	N	Lo Ni Fl		915	Im	G5 V
Blanum	0134	B421677-B	N	Na Ni Po		203	Im	M5 IV
Maishun	0135	B667587-C	N	Ag Ni		204	Im	M4 V
Ziris	0138	A873000-A		Lo Ni Ba		702	Im	M2 V
Dashu Aardir	0139	B87A120-D	N	Lo Ni Wa	A	613	Im	M1 V M3 D
Reference	0140	D100100-B	A	Lo Ni Va Rs		300	Im	K0 V
Rushugim	0231	E869372-6		Lo Ni		711	Im	G1 VI M8 D
Sishar	0234	B667420-C		Ni		204	Im	M4 V M8 D
Tuurqa Gaash	0236	D671443-9		Ni		103	Im	G9 IV
Brekin	0240	B58748C-A		Ni		100	Im	M2 V M7 D
Kiiris	0331	E10059C-7		Ni Va		724	Im	K4 V M0 D
Qungwyld	0332	A655561-A		Ag Ni		203	Im	M4 VI M9 D
Sirkiin	0334	A999310-C	S	Lo Ni Fl		523	Im	M1 V M9 D M2 D
Markun	0338	B887136-9	A	Lo Ni		700	Im	K0 V M2 D
Betras	0431	B634320-B	S	Lo Ni		804	Im	K5 V
Releis	0432	B150779-E	S	Po De		805	Im	K2 III M4 V
Lytras	0437	B400643-A		Na Ni Va		405	Im	M4 V
Indas Dakir	0439	B110100-C		Lo Ni		603	Im	M1 V M4 D
Ganshas	0440	A53A777-E		Wa		503	Im	G1 V M2 D
Cadion	0531	B655864-A	N	Cp		400	Im	K2 V M8 D
Lia	0537	E654988-A		Hi		702	Im	F4 V
Serimac	0635	B642652-A	N	Ni Po		902	Im	M7 VI
Patu	0637	B796676-7	S	Ag Ni		203	Im	M4 III
Zzugep	0731	B4539CD-C		Hi Po		300	Im	M1 V
Ferr?	0734	C797778-5	S	Ag		300	Im	M3 V M3 D
Pasi Metaa	0735	D584475-4	S	Ni		904	Im	M1 V
Sharash	0737	B898674-8		Ag Ni		823	Im	G1 V M3 D
Kur Limmu	0831	C549449-B		Ni		614	Im	K1 V M1 D
Bailaaze	0835	D438110-6	S	Lo Ni		503	Im	M6 V
Night	0839	A5749C9-F	N	Hi In		320	Im	K8 VI M4 D

The Cadion subsector contains 31 worlds with a population of 13.6 billion. The highest population is 7 billion, at Lia. The highest tech level is F at Night.

Releis 0432

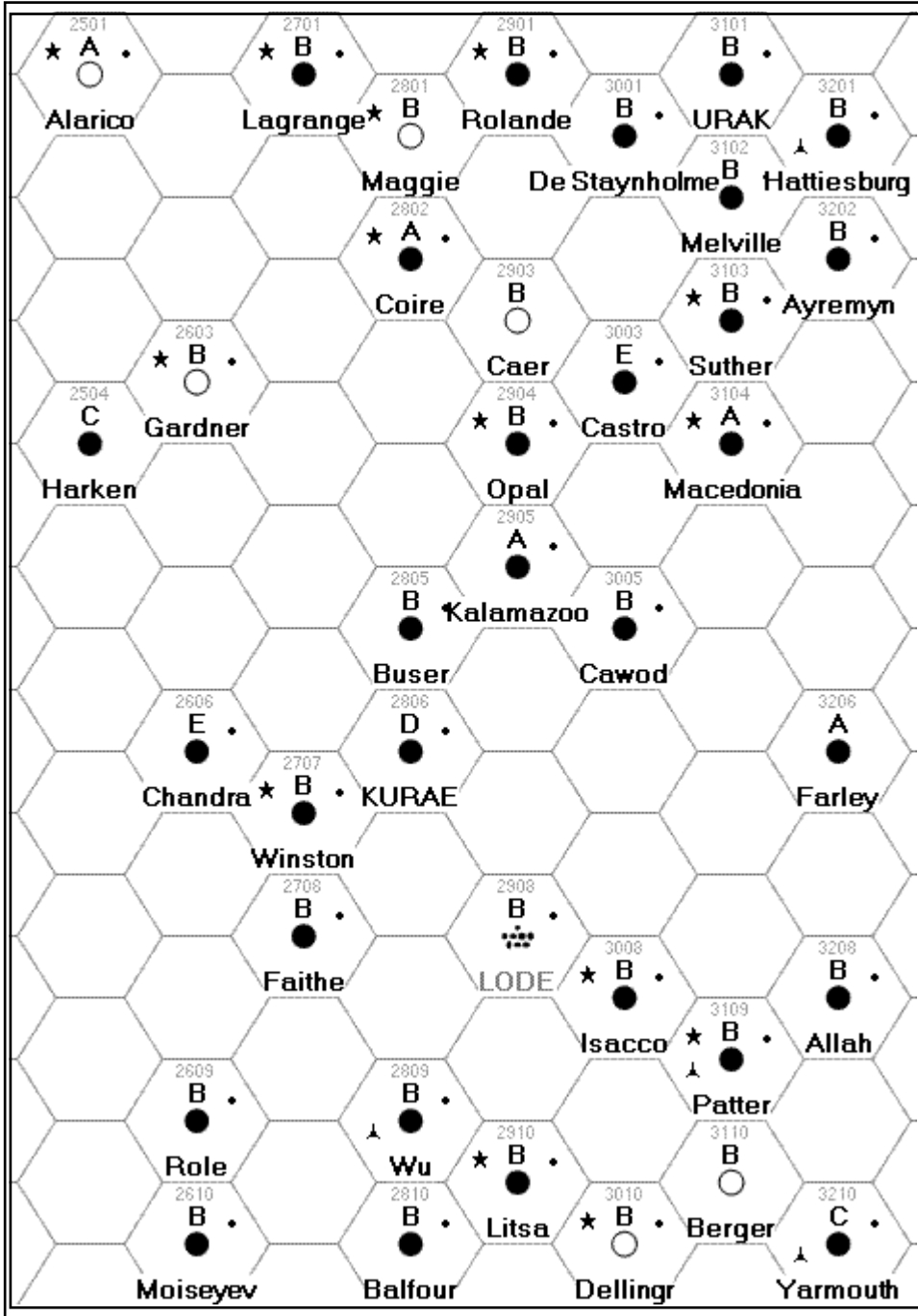
A poor desert world home to eighty million inhabitants, in orbit 7 of a giant orange star, which is highly variably and prone to sudden flare activity, making travel within the inner system hazardous due to sudden increases in solar radiation. The planet itself shows evidence of once having been the solid nickel/iron core of a much larger world, hence the small size and high density. Theories abound as how such a world would have lost it's crust, the most popular of which is that a massive ejection from this system's primary star blasted it away. However there is very little evidence or support from the scientific community to support this theory, meaning that most observers can't say with any certainty exactly what happened or even when in this system's lifetime.

Whilst the atmosphere is classified as thin, it is surprisingly thick in comparison to the planet's size and has sufficient oxygen to support human life. The source of this oxygen is unknown, marking this world as even more of a stellar oddity. Incredibly the atmosphere is showing signs of thickening, becoming ever more dense with each passing decade, an observation that has baffled every researcher who has ever studied this world. Not a drop of native water exists on Releis, water is recycled endlessly amongst the population and imported to this world in large tankers, despite economies of scale, water is unsurprisingly expensive on Releis.

Wildcatters skim the gas-giants of the 'Glabar' sub system, which is made up of a scattering of five small rocky worlds and five gas-giants. The Glabur sub-system orbits the primary star 'Hashi' in a very distant orbit nearly a light year away. The wildcatters harvest liquid hydrogen, hydrocarbons and water compounds, both of which are purified en route to Relies by slow moving though effective refineries. These enormous non jump capable structures are built locally in order to support native industry, the manufacture of which is a partial success story, with refinery/harvester designs being sold across the 4 corner's region in electronic blueprint format. As the Glabar system is so far away, normal space travel can take much longer than a standard jump, thus micro jumps are the favoured means of traversing the two stars. In essence the Glabar subsystem might as well be a full parsec away, hence water and food importers from neighbouring star systems can compete on even terms with local industries.

The population of Releis is scattered across 7 major city states each of which governs 1/7th of the available land mass as per the original articles of colonisation which date back to the days of the Sylean Federation. On such a resource poor world rivalries often ignite political, economic and occasionally military passions, resulting in blockades, embargoes, diplomatic posturing and warfare as one state in particular 'The Dominion of the Northern Wastes (DNW)' repeatedly flouts the rules as laid down in the many and various treaties negotiated between the city states throughout their long history. Traditional work revolves around the mining and smelting of Nickel/Iron, which was a lucrative business to be in when the world was first settled and only contained a few thousand miners/smelters. Over the years the population has swelled to it's present level, meaning that there is not enough local work to go around and not enough off-world investment to make up the shortfall. The planet's high tech level has exacerbated this situation further as most industrial processes are highly automated and cheap to manage with a few sophonts overseeing robot production lines and sophisticated work-bots. Law levels and government types vary from state to state and travellers are advised to check in advance which activities are legal and which are not. Thankfully where citizens do cross the line and commit an infraction, punishments are fairly light and can often be transmuted into fines.

The Lode Subsector *Subsector D of Zarushagar*



Sunspan Shipyards, based at Alarico (2501) in Lode subsector produce some of the finest starships in the Imperial Core. Specialising in high tech thoroughbreds Sunspan procure technologies and manufacture starships for both the Imperial Navy and the Imperial Interstellar Scout Service at the vacuum facilities of the Alarico Habitation. At present they manufacture high end patrol cruisers and close escorts though are rumoured to be involved in several naval black projects and top secret research.

Sunspan have a small commercial line of merchant traders and executive transports (such as yachts) available for sale under standard terms. Sunspan are known to make use of the very best in sensor and computing technologies and frequently release new software for use with their designs.

Farley 3206, This large high gravity world is a massive exporter of agricultural produce across the region and is a world that on the face of it seems to have it all. Blessed with a stable climate, the gentle warmth of three suns, a progressive and high tech manufacturing base and a class A starport to boot.

Indeed the only downside to life on Farley is the requirement to wear filter masks when outdoors as a select species of bacteria can cause lung irritation and chest infections when breathed in. The bacteria in question is highly resistant to all known treatments and whilst irritating is a fact of life until a treatment can be developed. Vast Jump 2 capable Agri-Tankers leave and enter the system on a daily basis to ship grain and other agricultural produce to the worlds of Cawod and Allah as well as Kapabu Sepple and Trostar in nearby Kerr/Massila Subsector.

Amongst the populace the world of Farley is at once exploited and revered, for example in order to maintain ecological balance, all materials must be recycled, water refuelling is forbidden (despite there being no gas giants in this system). Instead ice from cometary/Oort bodies are towed to the mainworld's highport and used as fuel stocks there, so surprisingly there is lots of work available for 'cutters' and occasionally beltors in this very busy system.

Coire 2802

The Coire binary system is home to a progressive and expansionist representative democracy of four thousand permanent residents, that by and large work in and around this systems's Class A shipyard and starport. As is usual at Tech 12 most processes are highly automated, leaving the residents in charge of vast robotic production lines and automated repair facilities. Laws are lax as all dwellings and habitations are firmly within the starport perimeter meaning that all accessible areas belong to the Empire not the local government. A large faction of the inhabitants would like to push out further into the world of Coire and establish independent settlements away from the starport's and shipyards, though the local indigenous life forms are highly evolved (this being an old star system) and not keen to mingle, being 100% incompatible with human life processes. Natural animal life forms are by and large, nasty, efficient and ruthless killing machines, (though not truly sentient) and are usually disappointed that they too cannot derive any nutrition from human beings and their left overs. Some of the braver hunters from across the Four Corners region like to visit this system as the indigenous life forms make for impressive kills and captures. Such trade is welcomed and encouraged by the starport/shipyard personnel, who in the main take the view that one less predator is a good thing.

Castro 3003

This frontier system, sits comfortably within the habitable zone of a stable white main sequence star, making it an ideal abode for life. Covered mostly with liquid water oceans and with a thick atmosphere this world is temperate, though prone to dangerous winds and other atmospheric conditions driven by the sun's heating's of the oceans, filter masks are required due to the dangerous high oxygen taint (a by product of the abundant marine plant life), whilst the high pressure (at sea level) can cause discomfort in other ways. Unsurprisingly hydrographic life forms are highly developed and specialised to fill distinct ecological niches, making the fishing Industry the main source of employment and export here. This planet's ruler 'Damen Shandii' has so impressed the populace with his flair for successful government that he has recently been voted 'Dictator for Life' and as of yet shows no signs of abusing his enormous power.

The Lode subsector, Subsector D of Zarushagar

PlanetName	Loc. UPP Code	B	Trade	Z	PBG AI	Stellar
Alarico	2501 A100433-F	N	Ni Va		714 Im	G4 V
Harken	2504 C525677-8		Ni		100 Im	M0 V M7 D M0 D
Gardner	2603 B200667-E	N	Ni Va Na		804 Im	M7 V
Chandra	2606 E6888CF-6				414 Im	G2 V
Role	2609 B64448B-E		Ni		104 Im	M2 V M7 D
Moiseyev	2610 B449895-D				304 Im	G2 VI M2 D
Lagrange	2701 B253420-E	N	Ni Po		504 Im	M0 V
Winston	2707 B639340-A	N	Ni		313 Im	K9 V
Faithe	2708 B8C758B-C		Ni		303 Im	K1 V M3 D
Maggie	2801 B100633-D	N	Ni Va Na		700 Im	M1 V M2 D
Coire	2802 A756440-C	N	Ni		404 Im	F4 D M3 D
Buser	2805 B897554-A		Ni Ag		804 Im	G5 D
Kurae	2806 D667989-6		Hi		714 Im	F2 V
Wu	2809 B8A68AC-C	S			503 Im	F9 D M2 D M0 D
Balfour	2810 B695754-D		Ag	A	502 Im	F2 VI M8 D
Rolande	2901 B625785-B	N			513 Im	M0 V
Caer	2903 B100434-D		Ni Va		500 Im	M3 V M4 D
Opal	2904 B465220-E	N	Ni		605 Im	F5 D
Kalamazoo	2905 A756440-D		Ni		902 Im	K2 V
Lode	2908 B000944-E		Hi In As Na		504 Im	M4 V
Litsa	2910 B654002-A	N	Ni		904 Im	F0 V
De Staynholme	3001 BA78798-C		Ag		713 Im	G9 D M5 D M2 D
Castro	3003 E7997A7-7				304 Im	F3 V
Cawod	3005 B425220-C		Ni		504 Im	M1 V M7 D
Isacco	3008 B434589-D	N	Ni		804 Im	M4 V
Dellingr	3010 B100434-C	N	Ni Va		301 Im	K2 V
Urak	3101 B6889CE-A		Hi		403 Im	K0 V
Melville	3102 B88467A-C		Ni Ri Ag		913 Im	K1 D
Suther	3103 B32159C-E	N	Ni Po		504 Im	K2 V
Macedonia	3104 A578343-D	N	Ni		802 Im	F8 V
Patter	3109 B786658-C	S	Ni Ri Ag		523 Im	F5 VI
Berger	3110 B200421-A		Ni Va		400 Im	G0 V
Hattiesburg	3201 B8A68AC-D	S			713 Im	G0 V
Ayremyn	3202 B695754-C		Ag	A	514 Im	F3 V M7 D
Farley	3206 AA78798-F		Ag		800 Im	F3 V M1 D M1 D
Allah	3208 B7997A7-C				214 Im	G8 VI
Yarmouth	3210 C425220-B	S	Ni		202 Im	M9 V M5 D

Alarico is one of the larger bodies of the planetoid belt named after this wild and raucous belter settlement. The pioneers that settled the belt mined out the interior of the asteroid prior to setting it spinning. The interior space was then flash blown by nuclear devices to form a spherical chamber roughly 1400 km in diameter. The asteroid was then turned on it's side with its former north pole directly aligned to the systems ecliptic plane, pointing it directly at the sun so that light and personnel could safely navigate the interior spaces. A second opening was then made at the former South Pole. At present the poles are respectively termed the Inner and Outer Egresses as one faces the inner system and the sun, whilst the other faces the Outer system and the stars. Alarico was then set spinning around this axis to provide centrifugal gravity ranging from a smooth 1.1. G at the equator to almost zero g at the egresses. Ships now enter through the inner egress and leave through the outer egress. Vast flowing and delicate belter settlements populate the interior spaces safe in the knowledge that micrometeoroid impacts are highly unlikely, allowing more of the structures to be transparent and open plan with parklands and reserves. Further attempts at terraforming were abandoned when this system was caught up in some of the bitterest fighting of the Imperial Civil War.

Wu 2809

Often derogatorily called the 'three dwarfs' trinary system, the Wu system is home to an exotic atmosphere world in which it's citizens live in domed-over natural fissures and rifts in the planetary crust. Whilst urbanised the cities were originally designed for much smaller populations and now are bursting at the seams. The result is endless law making and a bureaucracy that headed by it's popular leader Chairman Zu has curfews, dedicated worker rotations and simple but effective punishments for crimes. One such unpopular punishment is vat processing (making oxygen and tending massive algae vats, public works etc) as well as Exile. Exile is being much more frequently used than it used to be as the latest census has once again shown a rise in the population. The easy answer would of course be to extend the cities deeper into the crusts or further along the fissures, sadly that takes money and investment, both of which are in short supply on Wu.

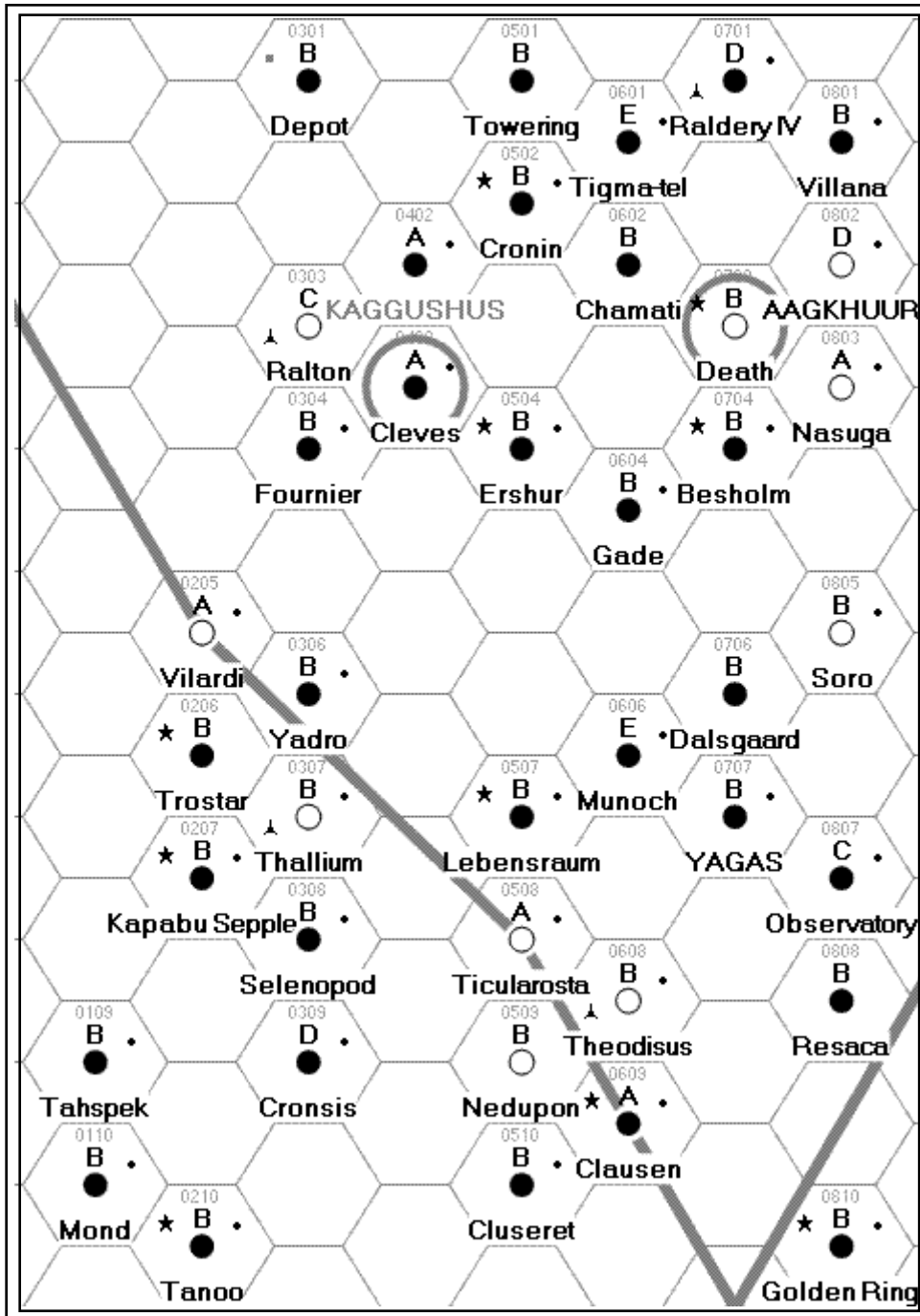
Lode 2908

The lode belt, once the source of much of this subsectors economic output and relative wealth currently shows signs of running dry. Crammed to the hilt with Belters, their families and communities, most Nickel Iron and Carbonaceous bodies have been exhaustively mined, leaving behind forgotten mine workings and thousands of overcrowded habitations filled with too many people for the work that is available. This incredibly well surveyed system is home to several zero g certificated mercenary units and true to the Belter way of life is beginning to diversify into other money making fields hence the recent upgrade of the starport to Class B, they hope to have A class certification within 10 years allowing them to sell brand new starships built by Belters for Belters.

Opal 2904

At the founding of the Third Imperium Opal was a strategically important though low value system that warranted a small naval base. Now those days have gone the base remains as as a testing and research station for both Navy contracted weapon manufacturers and testers that use the small world as testing range and source of hydrogen fuel (there being no gas giants in this system). Marines from across the Four Corners region compete with each other to be hand picked for 'drop troop' certification, prior to being taught how to assault a world from orbit in nothing but a pod or an ablative shield and grav parachute. This naval base has attracted a small civilian population of 600 technicians, service personnel and miscellaneous workers that assist the navy with the more mundane aspects of life on and around Opal. Widespotter base is gigantic orbital structure that has obviously seen better days and is fast approaching the end of its life, as many sections are not only abandoned but have remained empty for centuries, these sections are scarcely visited, airless and without grav support or power and would be visited even less if it were not for the occasional 'structural integrity' inspection, demanded by the Navy. Whilst the Naval presence rules this system by absolute decree, the civilian population have a council of trade union representatives that vote on important issues and negotiate with the Naval presence should the need ever arise, whilst loose and informal this is considered to be a participating democracy as any citizen can approach the council with any issues they may have.

The Kerr Subsector *Subsector A of Massilia*



Kerr Subsector is famous throughout the Imperium as being the home to a cluster of worlds that served as the administrative centre for the former Rule of Man (-2204 to -1776) when emperor Hiroshi II made Kaggushus the capitol, renaming it Hub/Ershur. Other administrative centres were also developed in support of the facilities on Kaggushus though were placed on neighbouring worlds within a 2 parsec sphere of the capitol in order to stimulate investment and industry in the region. The 'Hub' referred to those worlds collectively. To this very day Kaggushus is counted as an Important Imperial world, even though it has dropped off the main communication lines of the X-boat network.

Temporal Society of Kaggushus, put simply is one of many 'timers' clubs scattered across the Imperium. Founded in the Imperial Year 719, members of the club who wish to live in a future time give up most of their wealth in order to enter a 'state of the art' low berth, that it is hoped will allow them to enter cryogenic suspension whilst minimising the risks that go with 'low berth' suspension. Marketed as 'bio-statis' chambers (not to give the wrong impression) an expert team of doctors and medical technicians oversee the cooling and revival process. Indeed few if any of the berths failed to revive their occupants of the Millennium Celebrations of the Year 1000, which is an indication of the high quality of care provided by the society. Timer's clubs appeal by and large to optimistic dreamers that believe that the future will always be an improvement on the past. Some of the revived timers have been known to sign up again and rejoin the club after adjusting to modern life. For those individuals that do not have independent means of finance, the Society have a scheme where they may deposit cash in a savings/investment scheme so that when revived in the future the 'timer' will have a lump sum of credits with which to start a new life, provided that is, that the trust funds don't collapse in the meantime. As always expert financial advice is on hand to guard against this possibility and minimise the risks involved.

Kaggushus (0402 Kerr/Masilia A442AA7-G) is a cool small world, with a thin atmosphere (tainted with sulphur) and shallow, small seas. The planet itself is notable for having a thin hazy ring system which is unusual for a small world in orbit of a gas giant. Over time, it is expected that the ring system will slowly break up and disappear as the gravitational fluxes of both the gas giant and its other moons draw it apart. The original Villani colonials occupied what little lowland territory there was, bordering the Mideraen sea (this world's dominant ocean), prior to later arriving Solomani Rule of Man immigrants settling the rest of this world, the settlers being mostly humans from thin atmosphere environments and occasionally the mountain regions of 'Old Earth/Terra' itself. Both populations of settlers and colonials mixed overtime into a homogenous culture that have inherited both Villani and Solomani traditions and cultural patterns of behaviour.

Kaggushus is a hereditary fief and ultimately ruled by the Nolanar-Ahiiki line that have inherited the title of Count Nolanar since in Imperial civil war of 604-622. Whilst the present count 'Jefron Nolanar' represents Kaggushus at court and in Imperial affairs, day to day running of the system is handled by an appointed 'Guvnor' (a corruption of 'Governor' which is itself an old Solomani Term for ruler) namely Daylan Kishk, who, like the count rules from the island of Arsanus, being the central spike of a 300,000 year old impact basin and is presently in the process of restoring a great many of the old buildings destroyed in the 'Rule of Man Wars'. The remaining land on Arsanus is reserved as noble fiefs or set aside for use and development in the thriving tourist trade. Non Noble/Governmental indigenous citizens are not allowed to visit Arsanus. Despite this exclusion both Governor Kishk and Count Nolanar are popular with the 90,000,000,000 (ninety billion) inhabitants of this world for their inventive use of both old and new technological solutions to overcrowding, without resorting to draconian measures of population control often found on other high population worlds. Cities on Kaggushus extend deep into the crust and high into the atmosphere, supplemented by floating grav cities, platforms and orbital habitations some of which are 30 km in diameter. The result being that citizens on Kaggushus don't feel the intense effects of overcrowding and urbanisation common to other higher population worlds. Indeed many parts of Kaggushus are untouched conservation areas, cities abound with parks and reservations, living spaces are large. Technology and standards of living are amongst the highest in the Imperium, particularly in the robotics and medical sciences. On Kaggushus even the lowliest of citizens will have one or two robotic servants that make life easier for them, either by serving them directly or supplementing their workloads or in some cases by working instead of them.

World Name	Loc.	UPP Code	B	Trade	Z	PBG	AI	Stellar Data
Tahspek	0109	B5468BA-A				613	Im	G0V
Mond	0110	B737794-A				721	Im	G4V
Vilardi	0205	A8C6426-E		Ni Fl		813	Im	M1V
Trostar	0206	B78A635-C	N	Ni Wa		920	Im	F0 VI M1 D
Kapabu Sepple	0207	B87888B-A	N			604	Im	F8 D M7 D
Tanoo	0210	B78A452-D	N	Ni Wa		202	Im	K1 V M1 D
Depot	0301	B78A777-C		D Ri Wa		300	Im	F6 V
Ralton	0303	C9B58A9-8	S	Fl		413	Im	F1 V M5 D
Fournier	0304	B641764-A		Po		405	Im	G0 D
Yadro	0306	B35376A-A		Po		404	Im	F3 V
ThalImum	0307	B1008A7-C	S	Va Na		502	Im	F7 VI
Selenopod	0308	B331003-C		Ni Po Lo		114	Im	M8 V M2 D
Cronsis	0309	D75A310-A		Ni Wa Lo		604	Im	F1 D
Kaggushus	0402	A442AA7-G		Hi In Po Cp		904	Im	F1 D
Cleves	0403	A566422-E		Ni	A	512	Im	K1 VI
Towering	0501	B6548AC-B				600	Im	G4 V M2 D
Cronin	0502	B55205A-A	N	Ni Po Lo		903	Im	F6 V M2 D
Ershur	0504	B386521-B	N	Ni Ag		923	Im	K5 D M7 D M9 D
Lebensraum	0507	B544000-B	N	Ni Ba Lo		904	Im	G7 VI M7 D
Ticularosta	0508	A100654-G		Ni Va Na		322	Im	G3 V M9 D
Nedupon	0509	B100632-C		Ni Va Na		400	Im	A4 V
Cluseret	0510	B3627BD-C				604	Im	G2V
Tigma-tel	0601	E5536A9-5		Ni Po		424	Im	M1 D
Chamati	0602	B253364-D		Ni Po Lo		510	Im	F8 VI
Gade	0604	B797021-9		Ni Lo		312	Im	M6 V
Munoch	0606	E868576-7		Ni Ag		313	Im	F1 V
Theodisus	0608	B11058B-D	S	Ni		902	Im	M1 V
Clausen	0609	A456002-D	N	Ni Lo		204	Im	K1 D M7 D
Raldery IV	0701	D567466-8	S	Ni		602	Im	G4 D M8 D
Death	0703	B100300-E	N	Ni Va Lo	A	612	Im	M9 V M1 D
Besholm	0704	B84A445-C	N	Ni Wa		904	Im	G4 V M3 D
Dalsgaard	0706	B687100-D		Ni Lo		220	Im	F1 V M8 D
Yagas	0707	B566AFC-E		Hi		502	Im	K3 V
Villana	0801	B677334-B		Ni Lo		305	Im	M5 D M1 D
Aagkhuur	0802	D100958-C		Hi In Va Na		224	Im	F4 V
Nasuga	0803	A300620-D		Ni Va Na		214	Im	M4 V M5 D
Soro	0805	B7A0684-C		Ni De		204	Im	M2 V M0 D
Observatory	0807	C531544-9		Ni Po		714	Im	K2 V
Resaca	0808	B452456-D		Ni Po		810	Im	F3 V
Golden Ring	0810	B698541-A	N	Ni Ag		104	Im	M0 V

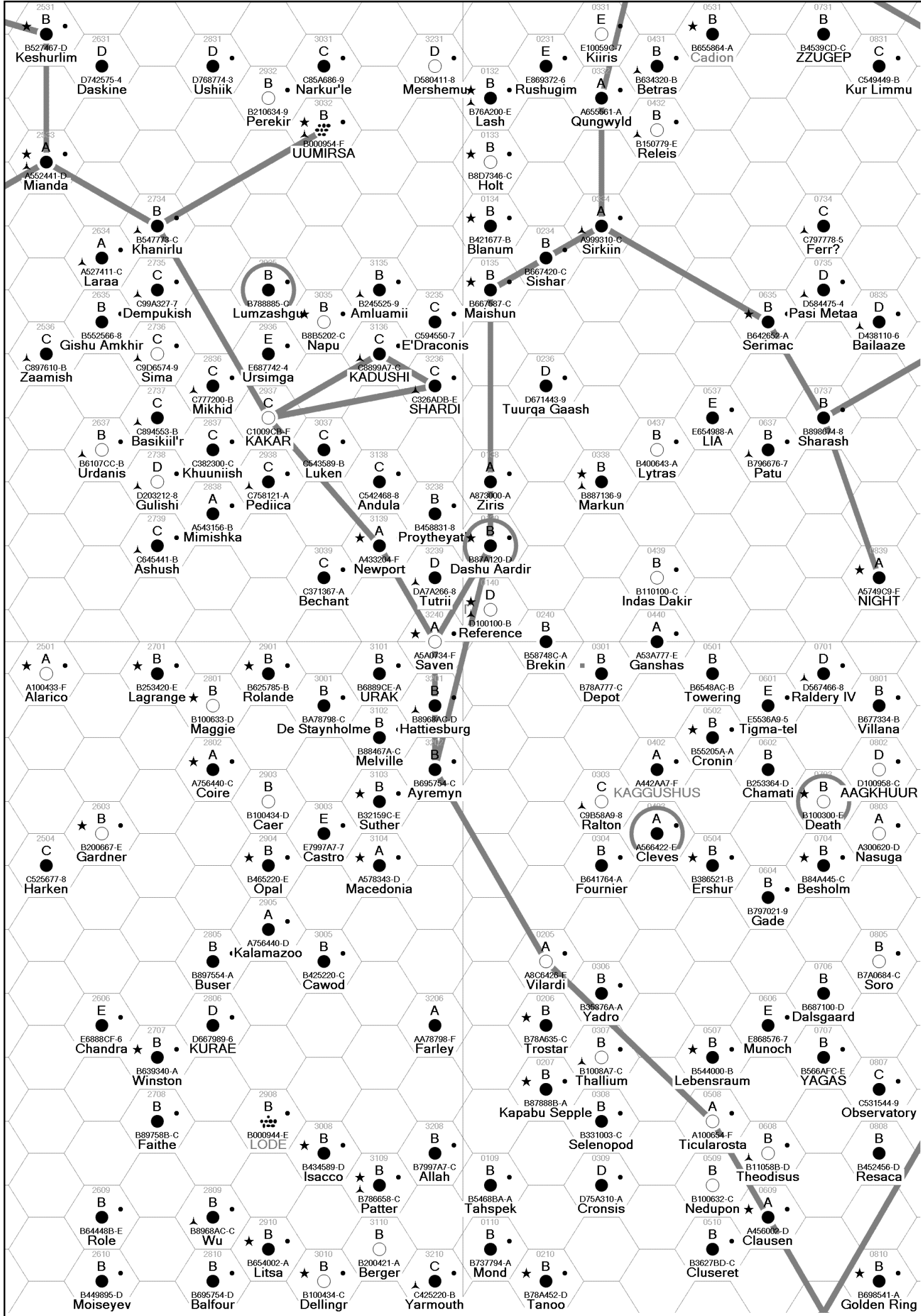
Yagas 0510 Kerr Subsector, this totalitarian state is a world in turmoil as wild rumours sweep the population and continuously point to the existence of a full fledged psionics institute or a cabal of rogue psionics that exists amongst the mainstream population. The forbidden disciplines were quite rightly made illegal at the time the of the Suppressions, closing down a psionics school in the process. Whilst the government has done all that it can to allay fears, stating several times over that psionics do not exist on Yagas, the mainstream populace is deeply distrustful of their government and fear that a cover-up/whitewash is taking place, or that the Oligarchs may well be in league with the psionics. In direct response to this 'Sweeping New Powers' have been claimed by the state allowing the unrestricted invasion of privacy of each and every citizen, there are even plans to implant small psion detectors in each and every citizen to alert the authorities to the use of psionic powers. Whilst noble in intent, such paranoia can not go on for much longer without some disastrous social/political consequences. TAS is presently considering placing an 'Amber Zone' warning for travellers to this system, as violence and mob mentality is increasing on this once peaceful world.

Cluseret 0510 Kerr Subsector/Massila

In the habitable zone of Sol2 (so named because of it's close similarity to the Solomani home star) Cluseret is a warm, gentle and small low gravity world, blessed with a standard atmosphere at 0.82 atmospheric pressure, small oceans (22% liquid hydrosphere) and a restless population of mixed race settlers and migrants. Headed by a corrupt government, the new unpopular leader of which has just had to raise taxes in order to pay for the latest round of civil controls, making this world a full fledged police state. The People's Enforcers maintain law and order and operate under the control and jurisdiction of the national army. Laws are numerous and benefit the state to the detriment of the citizen and import/exports and local manufacturing are in decline. Indeed the population of many more liberal neighbouring worlds have frequently called for trade tariffs and blockades of Cluseret in order to force the local government to step down and improve conditions for their citizens. Like most worlds with small oceans, there is lots of waste land mass that is simply uninhabited, it is rumoured that many citizens escape the coastal cities and live as survivalists in the wastelands and deep deserts of the Saturnalia Plateau to the north of Centersea (Cluseret's main ocean). Avian life abounds on Cluseret, evolution having favoured fliers above ground as flying is especially easy to do in low gravity conditions coupled with thick (in relation to this world's size) atmospheric pressures. Thus use of flying craft and grav vehicles can be especially dangerous at low altitudes, making the use of ground traffic much more common than would be expected of other tech 12 worlds

Cleves 0403 Kerr Subsector/Massila (Amber Zone)

Whilst cleves is considered to be the main world of the system, it is only the most central and not the most populated, Relying on high stellar technology hundreds of millions of people live amongst the asteroids and the ore rich planets of Vesser and Makill. Cleves serves more as a resort world or place to relax and enjoy time away from work as no other planet in this system is habitable. Travellers are advised to proceed with caution when visiting the Cleves system, the government is a participating democracy that relies heavily on the input of this system's population to decide issues. When divisive issues are debated, the population will naturally tend to decide things by the seat of their pants, which combined with the low law level present throughout the system often results in rioting, police actions and the ousting of mainstream politicians, many of which know that they will not be in office for too long and go to great pains to make as much of their influence and earning potential as they can before their term of public service ends.



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Adventures in the Four Corners Region.

Night Wave Entertainments

Night Wave entertainments could offer player character's work in arranging or setting up the security of their stars and special events. This could range from simple body guard duties to security aboard ship's or stations or even protecting the homes of the celebrities from the stalker's and nut jobs that would want to kill them. Many celebrities have shady pasts having climbed over people to get where they are today, those old rivals and enemies may want to see them dead. The biggest problems may arise when celebrities pick up a political or religious cause, or even openly criticise the actions or practices of local and megacorporations, thus damaging their brand identity. Hence a determined assassin could easily have a wide variety of motives and masters and be in a range of opportune places to do a great deal of harm, as celebrities by their very nature have numerous public engagements that are less than ideal from a security point of view.

Yagas

Player characters could also be requested by representatives of the government on Yagas to hunt down the rogue psions they believe to be operating amongst their population, or if sympathetic to psionics could be contacted by the psions to assist in trafficking psionic individuals on or off world. Alternatively mob hysteria may grip the populace when they visit Yagas resulting in characters being mistaken for psionics in which case things can turn ugly fast with the mob or if captured by agents of the government they will have an exceptionally difficult time of proving their innocence, especially if one or more members of the group really are psionics...

Lode

Whilst visiting the lode system characters may be asked to investigate accusations of claim jumping and sabotage, by independents or larger corporate interests. Alternatively they may be approached by the owner/proprietor of a small manufacturing outfit that manufactures ship components for the Class B starport, with the owner claiming that a rival company is trying to drive him out of business by sabotaging his operation, thus jeopardising the chances of his contract with the port being renewed. Alternatively he may well want player characters to do the same to the rival outfit he thinks is behind these attempts to sabotage the firm.

Releis

Characters can be caught up in a hot war between one or more of the several governments of Releis, either as bystanders in the wrong place at the wrong time or as mercenaries hired by one of the factions for a specific mission. Alternatively characters may be charged with trespass or espionage due to their status as 'off worlders'.

Coire

Characters may be hired to escort bored nobles and wealthy travellers into the wilds of Castro on a hunting expedition to capture or kill some of the nastiest indigenous life forms, this would most probably be the mission from hell, as native life is very predatory and often devious enough to be mistaken as intelligent though evil beings... This job may be lead by a professional hunter with a safari ship or someone wealthy enough to own a luxury yacht. If players have their own vessel it may be chartered to provide accommodation and storage or logistical support (depending on its capabilities).

Kaggushus

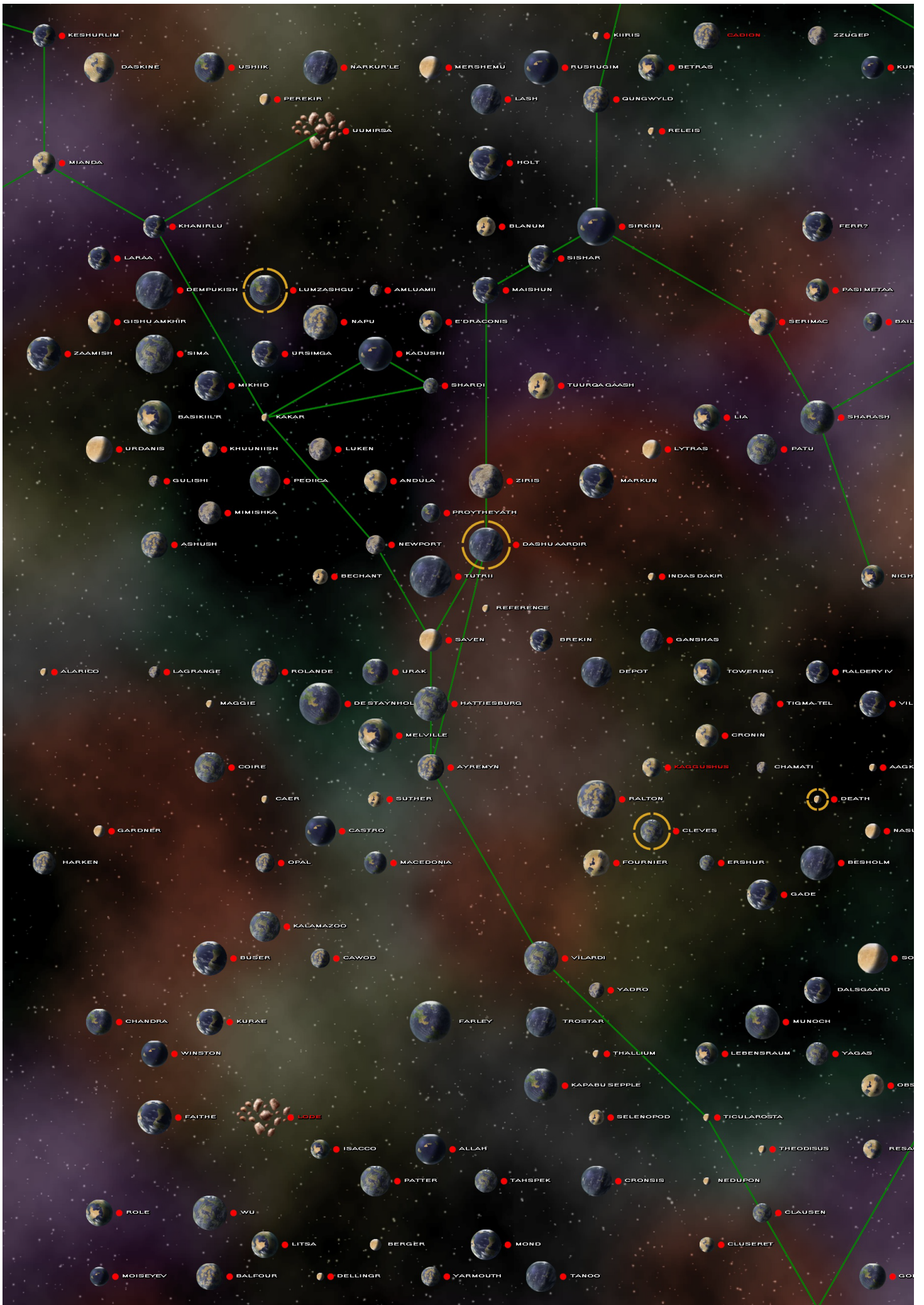
Characters could provide protection and support for a robotics scientist from Kaggushus that is worried that his or her new prototype design for a high tech robot could be stolen by a rival. During the adventure players may encounter corporate or megacorporate agents that will do anything to get the data or even agents of the government on Kaggushus determined to get back their missing military data set. Indeed the data may not even be a robot, it could be embarrassing political information about a figure in authority or the the Govnor or Count Nolanar himself.

Castro

Characters could assist an investigation on Castro to determine who or what agency has recently released a massive amount of neuro-toxin into the oceans, destroying fish stocks, the neuro-toxin may ultimately spread to every known species on Castro, turning a once vibrant life bearing planet into a collapsed eco-system as the mass extinctions take hold or simply become so diluted as to eventually be ineffective. In the meantime the bad news spread by media outlets and the x-boat network is seriously damaging to consumer confidence off-world, causing orders for fresh fish from Castro to plummet. If this sabotage of the world's oceans can be shown to be deliberate and traced to its source, who knows what may happen. The Imperial Ministry of Justice will certainly be very interested if this toxin is shown to be artificial or bio-engineered.

Sunspan Shipyards

Player characters may be hired by Sunspan to form the crew of a new prototype merchant undergoing trials, throughout the trials other elements of the crew attempt a hijacking of the new vessel. Characters may stop the hijacking or be blamed for it depending on circumstances. The options are clear, take the ship back or align yourself with the Hijackers, characters acting as low value personnel or 'neutrals' will be thrown out of the airlock as a waste of life support...



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Alternative Character Generation

FOR CLASSIC TRAVELLER

Before beginning character generation, the player should select two level-0 skills from the following lists to represent life experience gained prior to serving in a career. All characters have an innate ability with all weapons of 0. Characters should generate a UPP for their characters normally.

It can be helpful, though not essential if the player selects a suitable homeworld from the campaign area. Homeworld background skills are limited by the environmental and social conditions of the world in question as indicated in the pre-requisites below. E.g. A character wishing to obtain ship's boat as a background skill needs to come from a world with a size UWP smaller than 3 and a tech level of at least 7. Likewise a character wishing to obtain skill in handling tracked vehicles needs to come from a world with a hydrographics UWP of 9 or less (so that there's some dry land to practice on) and with a minimal tech level of 5+.

As always these tables represent what is typical, should you wish to deviate away from this and acquire skills not normally available on your homeworld then come up with a convincing backstory and get the referee's approval, after all the world in question might be rich enough to import higher tech items from elsewhere or some tracked vehicles might be adapted to explore the sea beds of your water world home...

Homeworld Vehicle Skills List							
Skill Type	Pre-Requisites						
	Size	Atmos	Hydro	Pop	Gov	Law	Tech
Grav Vehicle							8+
Helicopter		6+					6+
Hovercraft		4+					7+
Lighter Than Air Craft		6+					3+
Jet Propelled Fixed Wing Aircraft		5+					5+
Propeller Driven Fixed Wing Aircraft		6+					4+
Small Water Craft			3+				1+
Large Water Craft			3+				2+
Ship's Boat	3-	0					7+
Submersible	3+						4+
Tracked Vehicle		9-					5+
Wheeled Vehicle		9-					4+

Homeworld Social Skills List							
Skill Type	Pre-Requisites						
	Size	Atmos	Hydro	Pop	Gov	Law	Tech
Administration							3+
Bribery				6+			
Carousing				2+			
Computer							7+
Equestrian							1+
Forgery				6+			
Gambling							
Hunting							1+
Instruction							
Legal							
Streetwise				4+			
Survival		2-					
Vacc Suit		2-					

Character Generation Overview

Once the character's homeworld has been chosen and the two level 0 background skills have been selected, characters should select a career as per the basic book 1 rules, though consult the tables on the following pages.

Careers are broken down into Service Characters and Non Service Characters

Service careers are of course the Navy, Army, Marines, Scouts and Merchants as per book 1 rules, non service characters have their own career tables (later on in this book) and unlike the original traveller rules do not have a specific bias toward criminal activities. Whilst the Non Service career path can still be used to generate criminals and thugs, it is also possible for characters to gain scientific/technical skills and thus simulate a whole raft of expertise such as:

Academics	Technicians
Administrators	Thugs
Agents	Wealthy Travellers
Barbarians	Wildcatters
Bureaucrats	
Belters	And many more...
Body Guards	
Bounty Hunters	
Criminals	
Corsairs	
Doctors	
Drifters	
Flyers, both military and civilian	
Diplomats	
Enforcers	
Hunters	
Imperial Citizens	
Manager	
Nobles	
Pirates	
Privateers	
Sailors and Submariners	
Scientists	
Smugglers (both space and surface variety)	

Indeed pretty much everything that the Traveller universe could offer, remaining compatible with other traveller supplements such as Supplement 4 - Citizens of the Imperium or main rule books such as Book 4 Mercenary, Book 5 High Guard, Book 6 Scouts and Book 7 Merchant Prince.

Character's just cycle through the tables and roll for enlistment, commission, promotion, survival etc as normal, gaining skills as they do so. On receipt of a skill they may choose or roll for a specific table, and choose or roll for a specific cascade list. Simply reference the cascade list on the page and choose a suitable skill. Not every career is eligible for every skill, thus cascade lists vary by career, e.g. Blade combat for a marine character is significantly different to blade combat for merchants, characters should only be allowed to have skills pertinent to their career and choose from the ones shown on their career page. This prevents unlikely combinations from occurring, as always should you want a skill that your character is ineligible for then speak with your referee.

At the end of this section is an explanation of skills (Alternate Traveller Skills Section), some of which vary slightly (though within the bounds of common sense) from their explanations in earlier traveller publications.

Naval Characters

	Enlistment	Survival	Commission	Promotion	Reenlist
Navy Characters	8+	5+	10+	8+	6+
DM+1	Int 8+	Int 6+	Soc 9+	Edu 8+	Rank 2+
Dm+2	Edu 9+	Int 7+	Soc B+	Edu A+	Rank 4+
Draft:1					

Skill Eligibility

First Term

	2 Skills
Successive Terms	1 Skill
On Successful Commission	1 Skill
On Successful Promotion	1 Skill

All Characters Receive	Vacc Suit-1
Navy Captain	+1 Soc
Navy Admiral	+1 Soc

Personal Development Table

1	Physical
2	Brawling
3	Blade Combat
4	Gun Combat
5	Mental
6	Interpersonal

Service Skills Table

1	Environment
2	Vehicle
3	Tactical
4	Gunnery
5	Gun Combat
6	Blade Combat

Advanced Education Table

1	Environment
2	Professional
3	Flight
4	Tactical
5	Gunnery
6	Personal

Advanced Education Table (Edu 8+)

1	Professional
2	Interpersonal
3	Professional
4	Professional
5	Flight
6	Flight

Mustering Out Benefits Eligibility

Per Term Served	1
Rank 1 or 2	+1
Rank 3 or 4	+2
Rank 5 or 6	+3

Maximum 3 Rolls on the Cash Table

Blade Combat

Blade
Cutlass
Foil
Sword

Environment

Survival
Vacc Suit
Zero G Combat
Zero G Weapons

Flight

Navigation
Pilot

Gun Combat

Handgun
Laser Weapons
Submachinegun

Gunnery

Ship's Lasers
Ship's Energy Weapons
Ship's Particle Accelerators
Ship's Missiles
Meson Weapons
Screens

Mental

+1 Int
+1 Edu
Jack of All Trades

Interpersonal

Administration
Bribery
Carousing
+1 Soc
Instruction
Interrogation
Liaison
Recruiting
Steward
Streetwise

Physical

+1 Dex
+1 End
+1 Str

Tactical

Forward Observer
Fleet Tactics
Recon
Ship Tactics
Tactics

Professional

Communications
Computers
Electronics
Engineering
Gravitics
Medical
Mechanical
Naval Architect
Survey

Vehicle

Grav Vehicle
Helicopter
Hovercraft
Lighter Than Air Craft
Jet Plane
Prop Plane
Ship's Boat
Small Watercraft
Tracked Vehicle
Wheeled Vehicle

Ranks and Mustering Out

1	Ensign
2	Lieutenant
3	Lt Commander
4	Commander
5	Captain
6	Admiral
7	

Benefits Table

Low Passage
+1 Int
+2 Edu
Blade
TAS Member
High Passage
+2 Soc

Cash Table

1,000
5,000
5,000
10,000
20,000
50,000
50,000

Ranks 5 or 6 may add+1 to the roll

Marine Characters

	Enlistment	Survival	Commission	Promotion	Reenlist
Marine Characters	9+	6+	9+	9+	6+
DM+1	Int 8+	End 7+	Edu 7+	Soc 8+	Rank 2+
Dm+2	Str 8+	End 8+	Edu 8+	Soc A+	Rank 4+
Draft:2					

Skill Eligibility

First Term	2 Skills
Successive Terms	1 Skill
On Successful Commission	1 Skill
On Successful Promotion	1 Skill

All Characters Receive	Combat Rifleman-1 Cutlass-1 Vacc Suit -0
Marine Lieutenant	Handgun-1

Personal Development Table

1	Physical
2	Physical
3	Blade Combat
4	Mental
5	Environment
6	Blade Combat

Service Skills Table

1	Environment
2	Vehicle
3	Tactical
4	Blade Combat
5	Gun Combat
6	Gun Combat

Advanced Education Table

1	Vehicle
2	Professional
3	Tactical
4	Tactical
5	Environment
6	Interpersonal

Advanced Education Table (Edu 8+)

1	Tactical
2	Tactical
3	Professional
4	Professional
5	Interpersonal
6	Interpersonal

Mustering Out Benefits Eligibility

Per Term Served	1
Rank 1 or 2	+1
Rank 3 or 4	+2
Rank 5 or 6	+3

Maximum 3 Rolls on the Cash Table

Blade Combat

Bayonet
Blade
Cutlass
Dagger
Foil
Sword

Environment

Battledress
Survival
Zero G Combat
Zero G Weapons

Gun Combat

Auto Weapons
Combat Rifleman
Pistol
High Energy Weapons
Laser Weapons
Submachinegun

Mental

+1 Int
+1 Edu

Interpersonal

+1 Soc
Administration
Bribery
Carousing
Gambling
Instruction
Interrogation
Leader
Liaison
Recruiting
Streetwise

Physical

+1 Dex
+1 End
+1 Str
Brawling

Tactical

Combat Engineering
Demolitions
FA Gunnery
Forward Observer
Heavy Weapons
Recon
Tactics

Professional

Communications
Computers
Electronics
Forgery
Gravitics
Medical
Mechanical

Vehicle

ATV
Grav Vehicle
Ship's Boat
Small Watercraft
Tracked Vehicle
Wheeled Vehicle

Ranks and Mustering Out	Benefits Table	Cash Table
1 Lieutenant	Low Passage	2,000
2 Captain	+2 Int	5,000
3 Force Commander	+1 Edu	5,000
4 Lt Colonel	Blade	10,000
5 Colonel	TAS Member	20,000
6 Brigadier	High Passage	30,000
7	+2 Soc	40,000

Ranks 5 or 6 may add+1 to the roll

Army Characters

	Enlistment	Survival	Commission	Promotion	Reenlist
Army Characters	5+	5+	5+	6+	7+
DM+1	Dex 6+	End 5+	End 7+	Edu 7+	Rank 2+
Dm+2	End 5+	End 6+	End 8+	Edu 8+	Rank 4+
Draft:3					

Skill Eligibility

First Term	2 Skills
Successive Terms	1 Skill
On Successful Commission	1 Skill
On Successful Promotion	1 Skill
All Characters Receive	Combat Rifleman-1 Brawling-1 Vacc Suit -0
Army Lieutenant	SMG-1

Personal Development Table

1	Physical
2	Physical
3	Blade Combat
4	Mental
5	Mental
6	Blade Combat

Service Skills Table

1	Vehicle
2	Tactical
3	Gun Combat
4	Tactical
5	Blade Combat
6	Gun Combat

Advanced Education Table

1	Vehicle
2	Professional
3	Tactical
4	Tactical
5	Blade Combat
6	Gun Combat

Advanced Education Table (Edu 8+)

1	Environment
2	Tactical
3	Professional
4	Professional
5	Interpersonal
6	Interpersonal

Mustering Out Benefits Eligibility

Per Term Served	1
Rank 1 or 2	+1
Rank 3 or 4	+2
Rank 5 or 6	+3

Maximum 3 Rolls on the Cash Table

Blade Combat

Bayonet
Blade
Broadsword
Cutlass
Cudgel
Dagger
Foil
Halberd
Pike
Spear
Sword

Environment

Battledress
Survival
Zero G Combat
Zero G Weapons

Gun Combat

Auto Weapons
Combat Rifleman
Pistol
High Energy Weapons
Laser Weapons
Submachinegun

Mental

+1 Int
+1 Edu

Interpersonal

+1 Soc
Administration
Bribery
Carousing
Gambling
Instruction
Interrogation
Leader
Liaison
Recruiting
Streetwise

Physical

+1 Dex
+1 End
+1 Str
Brawling

Tactical

Combat Engineering
Demolitions
FA Gunnery
Forward Observer
Heavy Weapons
Recon
Tactics

Professional

Communications
Computers
Electronics
Forgery
Gravitics
Medical
Mechanical

Vehicle

ATV
Grav Vehicle
Ship's Boat
Small Watercraft
Submersible
Tracked Vehicle
Wheeled Vehicle

	Ranks and Mustering Out	Benefits Table	Cash Table
1	Lieutenant	Low Passage	2,000
2	Captain	+1 Int	5,000
3	Major	+2 Edu	10,000
4	Lt Colonel	Gun	10,000
5	Colonel	High Passage	10,000
6	General	Mid Passage	20,000
7		+1 Soc	30,000

Ranks 5 or 6 may add+1 to the roll

Scout Characters

	Enlistment	Survival	Commission	Promotion	Reenlist
Scout Characters	7+	7+			7+
DM+1	Int 6+	End 8+			
Dm+2	Str 8+	End 9+			
Draft:4					

Skill Eligibility

First Term

Successive Terms
All Characters Receive

2 Skills

2 Skills
Pilot-1
Vacc Suit-1
Survival-0

Personal Development Table

1	Physical
2	Blade Combat
3	Physical
4	Mental
5	Mental
6	Gun Combat

Service Skills Table

1	Vehicle
2	Environment
3	Environment
4	Flight
5	Professional
6	Mental

Advanced Education Table

1	Vehicle
2	Professional
3	Professional
4	Mental
5	Gunnery
6	Professional

Advanced Education Table (Edu 8+)

1	Professional
2	Flight
3	Professional
4	Professional
5	Interpersonal
6	Mental

Mustering Out Benefits Eligibility

Per Term Served 1

Maximum 3 Rolls on the Cash Table

*represents skills not found in the original traveller rules, see the explanations at the end of this section.

Blade Combat

Bayonet
Blade
Broadsword
Cutlass
Cudgel
Dagger
Foil
Halberd
Pike
Spear
Sword

Environment

Survival
Vacc Suit

Flight

Pilot
Navigation
Engineering

Gun Combat

Auto Weapons
Handgun
Rifle
Laser Weapons

Gunnery

Screens
Ship's Lasers
Ship's Missiles

Mental

+1 Int
+1 Edu
Jack of All Trades

Interpersonal

+1 Soc
Administration
Bribery
Carousing
Gambling
Instruction
Leader
Liaison
Recruiting
Steward
Streetwise

Physical

+1 Dex
+1 End
+1 Str
Brawling

Tactical

Forward Observer
Recon
Tactics
Ship Tactics
Zero G Combat

Professional

Broker
Communications
Computers
Electronics
Engineering
Forgery
Hunting
Legal
Gravitics
Medical
Naval Architect
Mechanical
Prospecting*
Science*
Survey

Vehicle

ATV
Equestrian
Grav Vehicle
Helicopter
Hovercraft
Jet Plane
Large Watercraft
Lighter Than Air Craft
Prop Plane
Ship's Boat
Small Watercraft
Submersible
Tracked Vehicle
Wheeled Vehicle

Ranks and Mustering Out	Benefits Table	Cash Table
1	Low Passage	20,000
2	+2 Int	20,000
3	+2 Edu	30,000
4	Blade	30,000
5	Gun	50,000
6	Scout Ship	50,000

Merchant Characters

	Enlistment	Survival	Commission	Promotion	Reenlist
Scout Characters	7+	5+	4+	10+	4+
DM+1	Str 7+	Int 6+	Int 6+	Int 8+	Rank 2+
Dm+2	Int 6+	Int 7+	Int 7+	Int 9+	Rank 4+
Draft:5					

Skill Eligibility

First Term

	2 Skills
Successive Terms	1 Skills
On Successful Commission	1 Skill
On Successful Promotion	1 Skill

All Characters Receive	Vacc Suit-1
Merchant 1st Officer Receives	Pilot-1

Personal Development Table

1	Physical
2	Physical
3	Physical
4	Mental
5	Blade Combat
6	Interpersonal

Service Skills Table

1	Vehicle
2	Environment
3	Mental
4	Interpersonal
5	Professional
6	Gun Combat

Advanced Education Table

1	Interpersonal
2	Professional
3	Professional
4	Flight
5	Gunnery
6	Professional

Advanced Education Table (Edu 8+)

1	Professional
2	Flight
3	Tactical
4	Professional
5	Flight
6	Professional

Mustering Out Benefits Eligibility

Per Term Served	1
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Maximum 3 Rolls on the Cash Table

*represents skills not found in the original traveller rules, see the explanations at the end of this section.

Blade Combat

Blade
Broadsword
Cudgel
Dagger
Foil
Sword

Environment

Survival
Vacc Suit

Flight

Pilot
Navigation

Gun Combat

Carbine
Handgun
SMG
Rifle
Shotgun
Laser Weapons

Gunnery

Screens
Ship's Lasers
Ship's Missiles

Mental

+1 Int
+1 Edu
Jack of All Trades

Interpersonal

+1 Soc
Administration
Bribery
Carousing
Gambling
Instruction
Leader
Liaison
Recruiting
Steward
Streetwise

Physical

+1 Dex
+1 End
+1 Str
Brawling

Tactical

Tactics
Ship Tactics
Zero G Combat
Zero G Weapons

Professional

Broker
Communications
Computer
Electronics
Engineering
Forgery
Legal
Gravitics
Medical
Mechanical
Robotics
Robot Operations
Science*
Survey
Trader

Vehicle

ATV
Equestrian
Grav Vehicle
Helicopter
Hovercraft
Large Watercraft
Lighter Than Air Craft
Jet Plane
Prop Plane
Ship's Boat
Small Watercraft
Submersible
Tracked Vehicle
Wheeled Vehicle

Ranks and Mustering Out Benefits Table

	Ranks and Mustering Out	Benefits Table	Cash Table
1	4th Officer	Low Passage	1,000
2	3rd Officer	+1 Int	5,000
3	2nd Officer	+1 Edu	10,000
4	1st Officer	Gun	10,000
5	Captain	Blade	10,000
6		Low Passage	50,000
7		Merchant Ship	100,000

Non Service Characters

	Enlistment	Survival	Commission	Promotion	Reenlist
Scout Characters	3+	5+			5+
DM+1		Int 8+			
Dm+2		Int 9+			
Draft:6					

Skill Eligibility

First Term

Successive Terms

All Characters Receive

2 Skills

2 Skills

Streetwise-1

Personal Development Table

1	Physical
2	Physical
3	Physical
4	Personal Combat
5	Personal Combat
6	Interpersonal

Service Skills Table

1	Vehicle
2	Interpersonal
3	Physical
4	Interpersonal
5	Personal Combat
6	Gun Combat

Advanced Education Table

1	Interpersonal
2	Professional
3	Professional
4	Interpersonal
5	Interpersonal
6	Professional

Advanced Education Table (Edu 8+)

1	Professional
2	Flight
3	Tactical
4	Environment
5	Gunnery
6	Mental

Mustering Out Benefits Eligibility

Per Term Served 1

Maximum 3 Rolls on the Cash Table

*represents skills not found in the original traveller rules, see the explanations at the end of this section.

Personal Combat

Blade
Broadsword
Cutlass
Cudgel
Dagger
Foil
Halberd
Long Bow
Military Cross
Pike
Repeating Cross
Short Bow
Sling
Spear
Sporting Cross
Sword

Environment

Survival
Vacc Suit

Flight

Pilot
Navigation

Gun Combat

Auto Weapons
Pistol
Laser Weapons
Submachinegun

Gunnery

Ship's Lasers
Ship's Missiles
Screens

Mental

+1 Int
+1 Edu
Jack of All Trades

Interpersonal

-1 Soc
Administration
Bribery
Carousing
Gambling
Instruction
Interrogation
Leader
Liaison
Recruiting
Steward
Streetwise

Physical

+1 Dex
+1 End
+1 Str
Brawling

Tactical

Tactics

Professional

Broker
Communications
Demolitions
Computers
Electronics
Engineering
Forgery
Legal
Gravitics
Hunting
Medical
Mechanical
Naval Architect
Robotics
Robot Operations
Science*
Survey
Trader

Vehicle

ATV
Grav Vehicle
Helicopter
Hovercraft
Jet Plane
Large Watercraft
Lighter Than Air Craft
Prop Plane
Ship's Boat
Small Watercraft
Submersible
Tracked Vehicle
Wheeled Vehicle

Ranks and Mustering Out	Benefits Table	Cash Table
1	Low Passage	1,000
2	+1 Int	5,000
3	+1 Edu	10,000
4	Weapon	10,000
5	Mid Passage	10,000
6	Vessel/TAS*2	50,000

*2 Choose an appropriate starship suitable to the character's background, most suitable ships are generally, scout/couriers, seekers, yachts, free Traders, Far Traders or Fat Traders, criminal or mercenary characters may have use of a Mercenary Cruiser or Corsair/Armed Merchant. Alternatively TAS membership can be taken. Referee's should impose reasonable limitations on the more powerful ships, such as shared ownership or hefty mortgages...

Alternate Classic Skill Rules

Air/Raft (Includes Grav Vehicle)

Whilst identical in effect to Grav Vehicle skill in that it allows an individual to operate any gravity suspended vehicle, receipt of this skill can be used as a positive DM to technical tasks such as troubleshooting, diagnosing or repairing air/rafts, indicating a familiarity with this class of vehicle over and above that of grav vehicle operators, probably as a result of past experience.

To Summarise a character with Air/Raft skill can lend his or her expertise to repairing or coaxing best performance out of an air/raft in addition to being able to fly all gravity suspended craft. Those other individuals who have received Grav Vehicle skill only have competence to fly gravity suspended vehicles and will be unable to perform maintenance tasks unless they have a separate and appropriate enabling skill such as Gravitcs, Mechanics, Engineering etc.

ATV (Includes Wheeled & Tracked Vehicle)

Represents expertise in both wheeled and tracked vehicles in an off road variety of environmental conditions and in addition to serving as both wheeled and Tracked vehicle at the same level of skill should also provide positive bonuses to all terrain operations, such as driving down a hazardous ravine, knowing how to approach a steep hill or swamp etc, whereas ground car, wheeled vehicle and tracked vehicle will not provide these bonuses.

ATV serves as wheeled vehicle and tracked vehicle at the same level

Auto pistol

The character is skilled at firing and using all pistols, though has received training and correct care in the use of automatic pistols, each level of skill should be used as a positive modifier for maintenance, repair and troubleshooting of automatic pistols.

A character with auto pistol-2 can fire any pistol at level 2 but also gains a positive modifier of +2 to any auto pistol related maintenance and troubleshooting task, such as field stripping, cleaning and repair.

Blade Combat

All characters will have a natural expertise of 0 in all blade weapons, choosing a level of skill in a specific blade type will of course raise this accordingly. Similar weapons such as blades and dagger's etc give rise to a natural expertise of ½ meaning that a character with dagger 3 could use a blade at level 1, the referee decides what is similar and what is not.

Computer

Represents competence at both operating and programming computers for specific tasks, most computers at TL9+ can be managed by operators without any computer skill due their easy to manage user interfaces that for the most part are intuitive or allow

spoken commands. This skill can also be used to write software programs for robots at 1 level lower in addition to the ability to gain access to computer networks and 'hack' their contents and systems.

Communications

Anyone can push the button and make the communicator work, but not everyone can repair, fine tune and boost the performances of the said communicators. This skill also allows users to shut down, block or jam the communications of others broadcasting through the same or similar wavelengths and channels. This skill also includes competence at using hand held electronic tools and sensors used to modify or repair communications equipment.

Electronics

Represents understanding of the principles of electrical sciences as applied to common technologies such as wiring harnesses, sensor systems, life support and indeed any electromechanical or electronic device.

Higher levels represent increased competence, this skill also covers the correct and safe usage of appropriate tools and sensor/diagnostic equipment used to complete the such tasks.

Engineering

The individual is a trained engineer and as such deeply understands the design, construction and operating principles of spacecraft capable drives such as powerplants, manoeuvre drives and jump drives

Engineering expertise also lends itself to more mundane technical aspects such as the repair and maintenance of a ship's life support system and hull features, such as radiators, hatches and locks, ports and turret machinery. Serves as Electronics, Computer, Mechanics, Gravitics and Communications at the same level when applied to spacecraft/starship mounted components or vehicles with similar principles such as G-carriers or Air/Rafts.

Higher levels represent increased competence, this skill also covers the correct and safe usage of appropriate tools and sensor/diagnostic equipment used to complete the such tasks.

Equestrian

Skill at mounting and controlling common beasts of burden for transportation purposes. This skill also represents knowledge of how to care for the aforementioned animals and can be used as a positive DM when attempting to provide veterinary care.

Forward Observer

The individual is trained to coordinate and adjust support fire from more distant weaponry particularly vessels in orbit. This skill also covers the correct use of necessary communications equipment and sensors

at -1 proficiency. Thus a character could attempt to repair a communicator at his forward Observer skill minus 1 level.

Gravitics

Represents understanding of the principles of gravitational sciences as applied to common technologies such as grav plates, inertial compensators and vehicle mounted gravitic thrusters such as null grav arrays, repulsors and gravitic suspensions all of which utilise the same basic principles, though may apply them differently. This skill can be used as Engineering/2 (divided by 2) if attempting to repair or maintain a spacecraft mounted deep space thruster that utilises gravitic principles. Higher levels represent increased competence, this skill also covers the correct and safe usage of appropriate tools and sensor/diagnostic equipment used to complete the such tasks.

Grav Vehicle

Represents general competence in the safe operation of gravity suspended vehicles, unlike Air/Raft skill this is more general and will not give a positive bonus on attempts to repair or diagnose faults with a grav vehicle.

Character's may select a specific class of vehicle as one in which he or she has greater familiarity as per the explanations listed under Vehicle, e.g. Speeder-1

Ground Car

Allows an individual to safely operate all wheeled vehicles (and some tracked vehicles at -1 proficiency), in addition to this ground car this skill represents background training allowing the safe maintenance and repair of ground cars and the diagnosing of faults, as well as an ability to fine tune the vehicle to improve performance. In comparison wheeled vehicle skill only represents an ability to operate a wheeled vehicle with none of maintenance benefits discussed.

Gun Combat

Represents skill in the safe operation, cleaning and basic maintenance of a general class of weapon as chosen below. Unlike specific skills in those weapons choosing a gun combat weapon category will not give positive bonuses when modifying or repairing specific weapons.

Choose 1 Category of Small Arms from the appropriate character tables in one of the Traveller books, I.e. Book 1 Characters & Combat or Book 4 Mercenary etc.

If desired characters may further choose a specific weapon from a given category, e.g. Auto pistol or revolver and in addition to being able to fire all pistols

at their level of competence will be able to apply their skills to cleaning, maintenance, repair and field stripping of that specific weapon type. Thus a character with Rifle 1 will be able to fire all rifles at level 1 and gain a bonus to the repair, fault finding, cleaning and stripping of all civilian rifles.

All characters have a natural gun combat skill of 0, characters may also use a specific gun combat skill e.g. Revolver at -1 skill for similar weapons. A character with auto-pistol 3 could use a revolver or body pistol with a skill of 2. Characters can also use dissimilar weapons at 1/3 competency e.g. A character with auto-pistol-3 could use a rifle at skill level 1.

Needless to say characters that receive pistol or handgun skill have all round competence when it comes to aiming pistols or all handguns respectively, but will not get the maintenance and repair bonuses for specific weapons.

Specific Weapon	Full Skill
Similar Weapon	Skill -1
Dissimilar Weapon	Skill 1/3

Gunnery

The Individual is trained and competent in the operation of weapons mounted on spacecraft, Gunnery expertise qualifies an individual for the position of Gunner aboard a space vessel.

Skills generated through the character creation rules should now represent familiarity, experience and specific training, not just in weapon operation (allowing each skill type to include gunnery skill at the same level for operating purposes), but also in the technical aspects of a specific weapon system and as such can be used as a positive modifier equal to the character's skill level on any roll/task to diagnose, troubleshoot, maintain or repair a specific type of weapon system as detailed below:

- Meson Weapons
- Screens
- Ship's Energy Weapons
- Ship's Lasers
- Ship's Missiles
- Ship's Particle Accelerators

To Summarise Gunnery Skill recorded on the Character Sheet as Gunnery-1, or Gunnery-2 etc, represents competence when targeting any spacecraft weapon system but no additional competence to repair or maintain the said systems, if recorded as Ship's Lasers-1 or Ship's Missiles-2 etc then in addition to allowing the gunner to target enemy vessels at the appropriate skill level for all weapon types will also allow the gunner to perform maintenance, trouble-

shooting and repair functions on the lasers or missiles respectively at their specific skill ability.

Thus characters with a single level of Screens can now target any weapon system as the technical principles of turret mounted weaponry will be pretty much the same from mount to mount, though won't have any bonuses to repair or maintain it, if for example it is a laser turret that has been made inoperative by battle damage. Spinal Weaponry is of course aimed at the target by the ship's pilot.

Hand Gun

As per Book 5 High Guard characters have general competence with all hand held firearms, though do not gain any maintenance or repair benefits that a single specific weapon skill would impart.

Helicopter

Represents general competence in the safe operation of Rotary Wing 1 vehicles including Ornithopters, unlike Air/Raft skill this is more general and will not give a positive bonus on attempts to repair or diagnose faults with a Helicopters or Ornithopters unless the player can name a specific craft that he or she wishes to have familiarity with.

Character's may select a specific class of vehicle as one in which he or she has greater familiarity as per the explanations listed under Vehicle, e.g. Ling Standard Products He-99 Assault Helicopter-1

Navigation

Represents competence at charting and plotting courses aboard ship, both in normal space and jump space. Characters with this skill can work as a ship's navigator/astrogator and can interpret essential navigational data from the ship's sensors and operate those sensors for navigational functions. I.e. Avoiding other spacecraft or objects and determine their relative positions and courses. Hence navigators often double up as the ship's sensor operator on smaller vessels.

Pilot

The character is familiar with the safe operation and handling of larger interstellar vessels (100 tons or more). Pilot skill serves as Ship's Boat-1 and also can be used to perform in system navigation tasks at Pilot/2 (divided by 2) round down. Thus an expert pilot with skill level 3 could plot a course to a different world in the same system at Level 1. Pilot skill represents training in the correct use and interpretation of data generated by vessel based sensors and avionics, when related to piloting tasks. Atmospheric /interface operations are handled by Ship's Boat Skill

Revolver

The character has received training and correct care in the use of revolvers, each level of skill should be used as a positive modifier for maintenance, repair and troubleshooting of revolvers. Characters with revolver skill can use similar pistols at -1 proficiency and dissimilar weapons at 1/3 competence.

A character with revolver-2 can fire any pistol at level 1 but also gains a positive modifier of +2 to any revolver related maintenance and troubleshooting task, such as field stripping, cleaning and repair. Should the character attempt to use a rifle or submachinegun then proficiency drops to 0 (1/3 of 2 is less than 1 so round down).

Rifle

The character is skilled at firing and using civilian long arms and has received training and correct care in the use of commonly encountered types of civilian rifles, each level of skill should be used as a positive modifier for maintenance, repair and troubleshooting of non military rifles.

A character with Rifle-2 can fire any rifle at level 2 but also gains a positive modifier of +2 to any Rifle related maintenance and troubleshooting task, such as field stripping, cleaning and repair. Similar weapons are handled at proficiency -1 (Military Rifles), dissimilar weapons at handled at 1/3 proficiency e.g. A pistol.

Science

Not in the original traveller works, each level of science represents expertise in a chosen scientific field of endeavour. Sciences can be any field chosen by the players and agreed by the referee though should be single discipline fields.

Recommended Sciences are as follows:

- Astronomy
- Biology
- Chemistry
- Geology
- Gravitics
- History
- Medical
- Meteorology
- Physics
- Xeno Biology
- Xeno Medicine

E.g. A Character with biology-3 is quite clearly a highly experienced and skilled biologist, no other explanation is necessary.

Other multi discipline sciences can be simulated by having one or more skills in their overlapping fields, e.g. A Cybernetics expert can be created by having one or more skills in computer, electronics and medical.

Ship's Boat

This Interface skill represents specific ability in safe surface to orbit (and back again) ship handling operations, such as atmospheric insertions, egress and all weather flying (regardless of the size of the craft). Pilot skill is used to handle spacecraft/starships conducting interplanetary flight. Pilot Skill counts as Ship's Boat -1 but the reverse is not true. This

interface skill is referred to as 'Ship's Boat' due to the fact that its most often the smaller craft that conduct interface operations. E.g a 200 ton merchant hitting a planet's atmosphere would be piloted using 'ship's boat' skill for the duration of the descent (or Pilot-1). When leaving the world's atmosphere and heading to jump point would use pilot skill for these routine tasks.

Ship's boat skill also includes competence at reading instruments and flight related sensors such as those provided by a ship's avionics suite and the vessel's main sensor array. This skill also allows characters to plot courses between points on a world's surface or in orbit.

Vehicle

Represents familiarity and the ability to safely operate a chosen type of vehicle, select 1 from the categories listed on each career sheet. If desired characters may elect to further specialise and state air/raft instead of Grav Vehicle, Ground Car instead of Wheeled etc. This will still give them the ability to operate grav vehicles, wheeled vehicles or tracked vehicles at their overall level but will also illustrate an insight into the character's background, indicating the specific type of vehicle trained in or greater familiarity with that type of vehicle allowing the skill to be used as a positive DM when attempting repairs, technical or diagnostic tasks. The chosen vehicle needs to be smaller than 20 displacement tons in volume, to be worthy of a bonus, larger vehicles are too mechanically complex and dispersed to gain bonuses for maintenance and normally require specialist crews to do so.

Hovercraft	All Air Cushion Vehicles
Large Watercraft	Tankers, Liners, Container Ships and Sailing Ships
Lighter Than Air Craft	Hot Air Balloons and Dirigibles
Jet Propelled Fixed Wing Aircraft	All Jet Propelled Aircraft
Propeller Driven Fixed Wing Aircraft	All Propeller Driven Aircraft
Small Water Craft	Book 5 High Guard
Ship's Boat	All Small Craft
Small Watercraft	Motorboats and Small Yachts
Submersible	Both Small and Large Underwater Craft
Tracked Vehicle	Small and Large Tracked Vehicles
Wheeled Vehicle	Ground Cars and Larger Commercial Vehicles

Xeno-Medicine

Now be taken as a separate skill in addition to the descriptions given by the rules in Book1, anytime Medical is taken or received as a skill, the character may elect to receive Xeno-Medicine instead and be more competent when treating members of non human species.

Traven Dahl Landis on the Bridge of the Free Trader Akhilleus by David Redington www.travellerart.com



Alternate Traveller Rules T4

Too many skills:

Having been a long time traveller fan, these is one thing that really irks me with Marc Miller's Traveller T4, put simply characters get what seems to be too many skills and skill levels, making them especially powerful when compared to characters made with other rules. This is even more prevalent when using the dynamic task system included with this issue. Under these rules characters that are more heroic either gain additional skills (which are their own reward) or should they fail in their heroism, gain additional payouts or material benefits as a pay off from their respective services.

A Quick workaround is this:

All Common Skills as per Page 26 T4 Rulebook (Usually 2 skills):

Maximum 4 Background Skill Levels from Homeworld Generation
3 Skill Levels for the first Term
2 Skill Levels for the second term
1 Skill Level for the third term and each ongoing term thereafter.

Skills obtained as a result of commission/promotion are unaffected, though may be altered by the optional rules below.

Pre career options such as college are unaffected as they represent intense periods of study and learning as opposed to vocational skill learning, e.g. Learning a skill appropriate to a promotion or career development etc.

Risking it for more skills

Should a player want to get more skills than is allowed under this system, then a fair rule is to add 1 point to the Injury target number for each skill. This represents putting your character in greater amounts of risk, volunteering for special duty, dangerous missions or assignments, which in turn can warrant additional training or experience.

In short be creative, but remember greater rewards vs greater risks will ultimately mean that your character is much more likely to be injured or even die, should character's fail the injury roll, they will not be eligible for additional skills, also subtract the roll from the target number (e.g. Roll of 4 on 2D from a target number of 8 = roll missed by 4 points) and consult the following table:

<u>Injury Roll</u>	<u>Achieved Exactly</u>	<u>Character is injured Muster Out as Normal (Close Scrape)</u>
	<u>Missed by 1 point</u>	<u>Character has permanent but superficial injuries</u> Subtract 1D +1(2-7) points from either STR, DEX, END. 1 extra roll on the mustering out cash table
	<u>Missed by 2 points</u>	<u>Character has permanent but significant injuries</u> Subtract 1D+2 (3-8) points from any physical attribute e.g. STR, DEX, END 1 extra roll of the mustering out cash table 1 extra roll on the benefits table
	<u>Missed by 3 points</u>	<u>Character has permanent and substantial Injuries</u> Subtract 1d+3 (4-9) points from all 3 physical attributes, STR, DEX, END. 1 extra roll on the mustering out material benefits table 2 extra roll on the mustering out cash table.
	<u>Missed by 4 points</u>	<u>Character has extensive permanent injuries.</u> Roll under the character's END score Success results in a total of 1D+4 (5-10) points removed from STR, DEX, END, INT and EDU. Failure results in Death. 2 extra roll on the material benefits mustering out table. 2 extra rolls on the cash mustering out benefits table.

Thus you can see the more foolhardy you are in relation to your character, the more you may lose, including the character's life.

Jasmine is a new army recruit, she loves the Imperial Army and considers herself lucky to be in service to Emperor Strephon, having passed all of the physicals and exams necessary to get into the Imperial Army Corps, having exceeded those around her who would have been content to join and serve in their own national/planetary armed forces. Jasmine can't wait to be deployed off world and see some of the greater Imperium. Serving as a private, her injury roll is 9, her commission roll is a 9 and her promotion roll is an 8. Two years in, her unit is deployed to a tech 15 militaristic Imperial world that has cut off all ties with the Empire, the world's legitimate

government being overthrown by elements of their own military, disrupting trade and commerce in the process. After several months the world's starport is still closed and diplomatic actions have failed to resolve the problem. The Emperor's patience has finally run out, a full scale assault is ordered.

After several days of bitter fighting resulting in the loss of many naval vessels to meson fire (on both sides of the conflict) the Navy succeed in landing their marines and establishing a beach head, having fully regained control of the starport, the plan is to land the army at strategically valuable points on the surface in order to spread out and Subdue the anti-Imperial forces. Jasmine's unit is part of a multi-force operation tasked to release the captured members of the former government, now guarded by rebels.

Jasmine's player would like to use this opportunity in her back story to get more skills, he decides to risk Jasmine in the combat and add +2 to the Injury Roll making it a foolhardy 11. Jasmine's player rolls 8 on 2d, missing the injury roll by 3 points. Jasmine is injured in the mission after trying to save some of her platoon members that were pinned down from the sustained fire of a floating grav battery. Her efforts whilst valiant go horribly wrong, despite saving her comrades she's extensively wounded by auto-cannon fire. Almost dead she's carried from the battlefield and put into an emergency cryoberth. She is successfully revived and treated for her extensive injuries and whilst not as capable as she once was, is lucky to be is alive, though not quite fit enough for the Imperial Army.

Jasmine is discharged from the service with full honours having had to subtract 7 points (generated from a 1D+3 roll) from each of STR, DEX and END, she's a war hero and a veteran and now qualifies for a pay off from the Army (additional 2 roll on the cash mustering out table) and some material benefits (+2 additional roll on the material benefits table). A kindly superior who knew that she wanted to travel, requested that she get membership in the Traveller's Aid Society that whilst expensive would at least allow Jasmine to live out part of her dream. The Imperial Army looks after their own.

Jasmine gets an additional Cr30,000 and permanent membership of the Travellers Aid Society, some post service education (+1 EDU) along with her honourable discharge. Jasmine misses her army colleagues but is proud of her short time in service and is determined to keep in touch with her army buddies whilst living her life to the full.

Playing it Safe

Conversely the opposite is true, should a character wish to improve his or her chances of surviving then simply apply a negative modifier to the target number for any commission/promotion opportunities for the present term for each point added to the survival roll, thus increased chances of survival by avoiding dangerous assignments, playing it safe or even outright cowardice can seriously reduce your chances of getting on and achieving higher ranks in the service.

Example: Flaya is an investigative agent with the Ministry of Justice having just joined the Ministry she is merely an Agent 3rd Class at the moment but would like to get on and build a worthwhile career hunting criminals and investigating threats to law to order, as such she has an injury target number of 8, meaning that she has to roll under 8 on 2d to survive the current term without incident. Flyer can elect to increase this and applies a positive modifier of +2 to the target number making it 10. Her player rolls 5 and survives the term by keeping well away from any dangerous assignments or activities. Such cowardice doesn't go down well with her superiors however who take a dim view of her actions. As a result she will have to work exceptionally hard to redeem herself and get on, her commission target number now drops from 8 to 6 and her promotion chances are very slight having dropped from 6 to 4. Thus it can be seen that cowardly actions are doubly punished in any service as both commission and promotion chances are damaged for the current term. Society rewards heroes and castigates cowards, or at least that's how it seems...

Example Character Created with these rules

947AA8 Human Male Ex Navy Able Spacehand Edward Alderson Cr120,000 1x Blade
Terms = 4 Age 34 Rank = E3

Grav Vehicle-1 Computer-1 Broker-1 Trader-1 Mechanics-2 Sensors-1
Astrogration-1 Electronics-1 Law-1 Short Blade-1 Environment Cbt-2 Survey-1
Forward Obs-1

A native of the Ershur Trinary System (Kerr/Massila 0504 B386521-B) , Edward is the youngest son of a wealthy business man, who despite being intelligent and well educated has failed miserably to get on as well in life as he would have liked. Too lazy to go to college and under pressure from his parents to do something 'socially acceptable' he joined his father's firm and tried for a short while to be a merchant broker and speculator, thinking that this would be a fast route to easy wealth. Disenchanted he then enlisted into the Navy at age 18 believing that soon he would have an easy life as an officer. Despite his long career and his best efforts he has never passed the officer's exam or had ever been selected for officer training, spending his first few years as an apprentice/spacehand finally being promoted to Able Spacehand. Edward has served in a variety of roles and naval departments throughout his career gaining a diverse and interesting set of skills, visiting lots of interesting worlds and places in the meantime. Edward is a bit of lost soul, having never found meaning or direction in life. After many years of success eluding him he gave up on his Navy career realising that he would be a bit old and too cynical to be an 'Ensign' so mustered out at age 34. Predicably he never once took greater risks throughout his career in the hope of obtain that fabled commission. He now hopes to ply his trade as a hostile environment certified technician for a construction/lifesupport company or a mercenary unit. Though it seems Star Mercs are reluctant to hire him given that he has limited combat expertise and has never fired a gun in anger throughout his career. He is a good mechanic though and familiar with ship board electronics, sensors and astrogration systems so he may well get some work aboard a small merchant or courier ship. If only he'd had some ambition he could have gone a long way, being a 'somebody' instead of a 'nobody', but not everyone wins in the game of life.

Citizens of the Imperial Core



Art by Andrew Boulton Find More Like this at www.traveller3d.com

The following characters have been created using the modified character creation tables in this issue of frontier report, these can be found on [page 73](#)

Cozer Talli

Human Female Ex Navy Lt Commander Terms 5 Age 38 Rank 03 Cr 45,000
666979

Pilot-2	Navigation-2	Grav Vehicle-1	Liaison-1	Vacc Suit-1
Brawling-1	Forward Obs-1	Blade-1	Survival-1	Wheeled Vehicle-0

A shy and uneducated, pasty skinned and brown haired agricultural girl, Cozar wanted something better in life than farming which was the main form of employment on her Native Busar (Zarushagar Sector 2805 B897554-A Ni Ag, a warm and pleasant world that sits comfortably in the habitable zone of a bright yellow star).

After seeing an Imperial recruiting vid that ignited in her a passion for travel and adventure she decided that Navy life was for her. Determined not to fail she quickly rose through the ranks and the various departments to become a flight officer, piloting both large and small craft alongside the Imperial Marines. Early on in her career Cozar was almost killed during a raid on a separatist world that wished to leave the mighty Third Imperium when she served as a forward observer. The marine strike team she was posted with, barely had enough time to get out of the area before the incoming meson fire obliterated everything. She quite naturally considered leaving the service in the wake of this near death experience but thought back to her earlier life on Busar and decided that the service was infinitely better than life there, even with the dangers that serving the empire brings. The service had educated her giving her valuable skills and confidence, something that was dearly lacking in the farm girl that had left her family's homestead those many years ago.

Having recently mustered out she is looking to find work as a pilot or Navigator aboard a small merchant vessel or courier, with her impressive resume and air of quiet competence she is sure to find work soon.

Brando Tyrell

B556B8 **Human Male Ex Civilian Broker** **Terms 4** **Age 34** **Cr21,000**

Streetwise-2 Broker-2 Blade-1 Trader-1
Computer-1 Legal-1 Grav Vehicle-0 Small Watercraft-0

Tall, dark haired, grey eyed and built like a man destined for violence, Brando is anything but, whilst physically strong, he is like many people of his bulk clumsy and lacking in grace, not a deep thinker he likes to read and is surprisingly well educated. What he lacks in intelligence he makes up for with a quiet wisdom and perception. Put simply he understands people, their needs and their motivations, a skill that has often worked well for him during his career as in independent broker and trader.

Born on (and indeed still living on) Trostar (Massila 0206 B78A635-C, a non Industrial Water World), Brando has wound down his business selling all of his stock and assets for a chance to travel, having felt that life was passing him by and that in the midst of a gigantic interstellar civilisation he was limiting himself by not seeing some of the many worlds and exciting wonders out there. He has read extensively and knows lots about the general history of the Imperium and has good general knowledge of the most popular tourist destinations in chartered space. He would like to see them all but is resigned to the fact that he probably won't only having one human life. If he could get anagathics he would but at present they are far too expensive for him. He keeps a blade about his person just in case!

Kylie 'Fast Draw' Pattering

4B637 **Human Female Ex Law Enforcer** **Terms 1.5** **Age 26** **Cr10,000**

Streetwise-2 Pistol-1 Grav Vehicle-0 Vacc Suit-0

A Petite, Brown Haired, brown eyed and dark skinned native of the Wu Trinary System (Zarushagar 2809 B8A68AC-C S) an earth normal sized world with an exotic and unbreathable atmosphere, that packs its 500 million inhabitants into overcrowded and rigidly controlled cities. Despite the exacting controls of the civil population such as curfews, designated shifts of work activity and unrestricted access to a person's privacy by the state, its leader Chairman Zu still remains popular having solved many of this world's social ills such as petty crime. Criminals once caught are sentenced to service in 'community work' or expelled from society altogether being exiled to nearby worlds that have some positive relations with Wu.

Many of these lost citizens have invariably began political enterprises and in some cases become freedom fighters returning to Wu in secret in order to destabilise the government, reveal to the masses that they are little more than slaves to the government machine and bring about social revolution. Kylie was unfortunate enough to run into one of these 'returnees' who clandestinely enlisted her aid after infiltrating the headquarters of the 'People's Guardians' where she had just began her training as an urban law enforcer. She was adept with handguns and nick named 'Fast Draw' by her colleagues. Eventually the resistance members were captured and she was implicated and despite her pleas of innocence was tried by the authorities and exiled as an undesirable.

Kylie is not a deep thinker and almost has a slave mentality showing very little in the way of personal initiative or a desire to question the status quo too much and is a product of the state run and schools of Wu designed to indoctrinate citizens into the 'party way of thinking' turning children into workers with an ideology that has been carefully crafted by the ruling elite. Kylie has not much sympathy for the 'returnees' as they've abused her trust, resulting in a criminal investigation that affected not just her but her family too and ultimately pushed her into exile and away from the family she loved. At 26 years of age she now finds herself all alone in the universe with not much money and exceptionally vulnerable to anyone who would wish to take advantage of her unquestioning nature. She's been told that it's a good thing to get a job, hence she is now looking for paying work. To this very day she believes that the system of government on Wu is the best in known space and can't understand why other world's wouldn't wish to adopt it.

Vollitiri Kishigal

778479 **Human Male Ex Mercenary** **Terms 1.0** **Age 22** **Cr none**

Streetwise-1 Blade-1 Carousing-1 Grav Vehicle-0 Wheeled Vehicle-0

Some people are just destined to go through life as failures, Vollitiri is one of them, being well built, fairly tough and from a very well established and respectable Villani community. 'Volli' as his few friends call him, is chronically lacking in intelligence and would make good cannon fodder in the military forces of many a decent world. At age 18 he tried to join the Imperial marines but was not accepted, scoring too low on the intelligence test. After this he submitted to the draft only to find that he was not wanted by a single Imperial service, once again because of low test scores. He then joined a small mercenary unit who after taking him on came to regret their decision. Volli just seems incapable of retaining any complex knowledge, though can quite naturally put people at ease. Having been sacked by the his old unit he is on the hunt for paying work and has no money without employment he may turn to crime and would probably make a very good thug.

Theygar Ulishi

5B9796 **Human Female Ex Army Captain** **Terms 3.5** **Age 32** **Cr22,000**
1 x Mid Passage

Dagger-2	Combat Rifleman-1	Brawling-1	SMG-1	Recon-1
Tactics-1	Forward Obs-1	Combat Engineering-1	Tracked Vehicle-0	Vacc Suit-0


A slim, athletic blond woman, from the airless world of Lytras (0437 B400643-A) in the Imperial Core, Theygar worked hard to join the Imperial Marines but sadly failed to pass the entrance exam. Whilst her scores were not high enough for the marines, they surpassed the requirements of the Imperial Army so she opted to join them and quickly passed through her basic training obtaining the rank of Captain, Theygar had an illustrious career until she injured herself when erecting field fortifications for an exercise. She has since mustered out of the army and is seeking work in a mercenary unit. She can afford to support herself modestly for another year on her savings and mustering out benefits so for the time being is choosily examining offers from the several mercenary companies that operate in the region. Like most prospective mercenaries her underlying concerns mostly revolve around pay scales and the unit's past performance, she will consider non mercenary employment if a really good offer is on the table, but it had better be a really good offer...

MegaTraveller

Cavalry, Combat and Recon Vehicles

By Michael G Barger

M133A6 *Hastati* Cavalry Combat Vehicle

Vehicle Data Sheet																																																																																																																																
Crew/ID	01	Vehicle Name:	M133A6 <i>Hastati</i> Cavalry Combat Vehicle (CCV)							Vehicle Illustration:																																																																																																																						
	02	Vehicle Type:	HACV/TC (Heavy Armored Combat Vehicle / Troop Carrier)							(by Zach Wolfe)																																																																																																																						
	03	Tech Level:	15																																																																																																																													
	04	Total Price:	30.233 MCr (note 1)																																																																																																																													
	05	Bulk Purchase Discount (90%):	27.210 MCr																																																																																																																													
	06	Est. Annual Maint. Cost (10%):	03.023 MCr																																																																																																																													
07	Licensed Manufacturer(s):	Delgado Trading, Ling-Standard Products (notes 2 and 3)																																																																																																																														
08	Primary (Authorized) User(s):	Imperial Army, various sector/subsector IA formations																																																																																																																														
Hull	01	Hull Damage Capacity:	09 DP (Inoperative) / 23 DP (Destroyed)																																																																																																																													
	02	Unloaded Weight:	633.32 MT																																																																																																																													
	03	Loaded Weight:	650.75 MT																																																																																																																													
	04	Total Displacement:	10.05 Td																																																																																																																													
	05	Configuration:	1 (Wedge) AF (Airframe)																																																																																																																													
	06	Armor:	72G (Bonded Superdense)																																																																																																																													
Power	01	Power Plant Damage Capacity:	02 DP (Inoperative) / 03 DP (Destroyed)																																																																																																																													
	02	Maximum Power:	275.44 MWe																																																																																																																													
	03	Fuel Capacity:	11.467 kl																																																																																																																													
	04	Normal Maneuver Endurance:	5.0 full days / 15.0 work day(s) (note 8)																																																																																																																													
	05	Combat Maneuver Endurance:	1.0 full days / 3.0 work day(s) (note 8)																																																																																																																													
	06	Combat Weapons Endurance:	1.0 full days / 3.0 work day(s) (note 8)																																																																																																																													
Locomotion	01	Locomotion Damage Capacity:	04 DP (Inoperative) / 05 DP (Destroyed)																																																																																																																													
	02	Normal Maneuver Thrust:	0.9 G																																																																																																																													
	03	Combat Maneuver Thrust:	1.7 G																																																																																																																													
	04	Locomotion Notes:	The <i>Hastati</i> has two power settings, normal and combat. Performance characteristics at both settings are shown.																																																																																																																													
	05		<table border="1"> <thead> <tr> <th colspan="12">Performance characteristics under Normal Maneuver (NM) power</th> </tr> <tr> <th colspan="2"></th> <th colspan="2">Thrust: 0.90 G</th> <th colspan="2">Atmosphere:</th> <th colspan="2">Vacuum</th> <th colspan="2">Very Thin</th> <th colspan="2">Thin</th> <th colspan="2">Standard</th> <th colspan="2">Dense</th> <th colspan="2">Very Dense</th> </tr> </thead> <tbody> <tr> <td>NOE:</td> <td></td> <td>190 kph</td> <td>190 kph</td> <td>190 kph</td> <td>190 kph</td> <td>190 kph</td> <td>190 kph</td> <td>182 kph</td> <td>182 kph</td> <td>182 kph</td> <td>182 kph</td> <td>182 kph</td> <td>182 kph</td> <td>182 kph</td> <td>182 kph</td> <td>182 kph</td> <td>182 kph</td> </tr> <tr> <td>Cruise:</td> <td></td> <td>810 kph</td> <td>810 kph</td> <td>810 kph</td> <td>810 kph</td> <td>810 kph</td> <td>729 kph</td> <td>547 kph</td> <td>547 kph</td> <td>547 kph</td> <td>547 kph</td> <td>547 kph</td> <td>547 kph</td> <td>547 kph</td> <td>547 kph</td> <td>547 kph</td> <td>547 kph</td> </tr> <tr> <td>Top:</td> <td></td> <td>1080 kph</td> <td>1080 kph</td> <td>1080 kph</td> <td>1080 kph</td> <td>1080 kph</td> <td>972 kph</td> <td>729 kph</td> <td>729 kph</td> <td>729 kph</td> <td>729 kph</td> <td>729 kph</td> <td>729 kph</td> <td>729 kph</td> <td>729 kph</td> <td>729 kph</td> <td>729 kph</td> </tr> </tbody> </table>									Performance characteristics under Normal Maneuver (NM) power														Thrust: 0.90 G		Atmosphere:		Vacuum		Very Thin		Thin		Standard		Dense		Very Dense		NOE:		190 kph	190 kph	190 kph	190 kph	190 kph	190 kph	182 kph	182 kph	182 kph	182 kph	182 kph	182 kph	182 kph	182 kph	182 kph	182 kph	Cruise:		810 kph	810 kph	810 kph	810 kph	810 kph	729 kph	547 kph	547 kph	547 kph	547 kph	547 kph	547 kph	547 kph	547 kph	547 kph	547 kph	Top:		1080 kph	1080 kph	1080 kph	1080 kph	1080 kph	972 kph	729 kph	729 kph	729 kph	729 kph	729 kph	729 kph	729 kph	729 kph	729 kph	729 kph																																	
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Communication	01	(note 4) Primary:	2x Maser (max range = 50,000 km.)																																																																																																																													
	02	Alternate:	Maser (max range = 50,000 km.)																																																																																																																													
	03	Contingency:	Laser (max range = 50,000 km.)																																																																																																																													
	04	Emergency:	Radio (max range = 50,000 km.)																																																																																																																													
	05	Solar Backup Power System:	A solar panel on the top deck provides backup emergency power to any one communications system (.009 MWe).																																																																																																																													
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Entries in green are additional information provided for use by players and referees. Some of this information is based on house rules from MTU so feel free to ignore or modify it if you wish.

Note1: The M133A6 *Hastati* CCV is an approved Imperial Joint Defense Design, accepted by the Imperial Joint Equipment Board (JEB), so no architect's fees apply.

Note2: The system has been entered into the Imperial Supply Catalog by the Imperial Defense Logistics Board (IDLB) as Line Item Number (LIN) V20114; Imperial Stock Number (ISN) 394-V0-105-2919.

Note3: When ordered through Imperial supply channels the system will be equipped with all listed components and meet all listed specifications. When purchased through contract from a licensed manufacturer, some component substitution and modification may be necessary. Any such modifications are subject to prior approval by the ordering agency, or the manufacturer may be found to have violated the terms of their license agreement and may consequently be subject fines and/or license revocation.

Note4: The primary maser communications systems maintain a constant link to the unit command information network & positioning system for the vehicle crew and infantry combat team. The backup maser is not powered unless a primary system fails. The laser backup is provided in case all maser systems fail. The laser system is capable of voice communication only; it does not provide the network targeting information that the maser systems provide. The radio is for emergency use only, but is powered during normal operations as a signals-intelligence collection source to pick up and record enemy broadcasts for analysis.

Note5: Vehicle ammunition loads will be a mix of ammunition types based on anticipated mission requirements, not to exceed a total of 800 rounds.

Note6: Basic and Extended Life Support does not extend to the vehicle's fuel tanks. Crew position space is doubled to support extended operations (more than 8 hours) but passenger positions are not.

Note7: 0.511 kl of space is allocated for storing equipment used by the dismount infantry team. Space for storing vehicle Basic Issue Items (BII) and Crew Equipment is designated in the Fuel & Miscellaneous Section, lines 04 and 05 of the Vehicle Design Worksheet. A detailed listing of crew equipment and BII is provided on the following page.

Note8: Operating solely in Normal Maneuver mode, the vehicle has a maximum endurance of 135 hours (5.62 days). When operating at full power, the vehicle has a maximum endurance of 83 hours (3.46 days).

Note9: Note that installed Electromagnetic Masking (EMM) reduces emission level by one, but this is cancelled by the small size of the vehicle's hull which increases the emission level by one.

The M133A6 Hastati depicted here is derived from three holoimages taken on 039-1110 just after major combat operations to recapture Esalin (Spinward Marches, 1004) were completed. According to the markings captured in the holoimages, the vehicle is that of the platoon executive officer, third platoon, B troop, 1st Squadron - 322nd Cavalry (Combat), then attached to the 1949th Composite Assault Group (an ad-hoc unit created for the relief of Esalin). The vehicle commander is shown to be First Lieutenant Ari Lanchettes, then acting platoon commander. The other names stenciled on the vehicle are: Pilot - Warrant Officer 1 (WO1) Piedrewski, Gunner - Sergeant Paolo, and Infantry Team Leader - Sergeant Kigidarma. However, the crew names depicted on the vehicle were painted before combat operations on Esalin began. Given the heavy casualties suffered by the assault force, the actual composition of the vehicle's crew at the time the holoimages were taken is subject to speculation. In fact, Imperial records indicate that this particular vehicle was destroyed, and Lieutenant Lanchettes killed, in mopping up operations less than a month after the vehicle images were taken.

The only crewmember that can be determined conclusively at the time the holoimages were taken is Lieutenant Lanchettes, as the images were taken during the ceremony in which he was awarded the Medal for Conspicuous Gallantry (MCG) in recognition of his actions in the initial ground assault on Esalin. The accounts of his actions in these, and subsequent actions leading up to his death, resulted in this award being posthumously upgraded to the Starburst for Extreme Heroism (SEH), personally presented to the Lieutenant's parents by Archduke Norris in a ceremony on Regina on 052-1112. Ari Lanchettes was also retroactively promoted to Captain and awarded an honorary knighthood in the same ceremony.

The meaning of the various vehicle markings are as follows:

"B35": indicates that this is the 5th vehicle of 3rd platoon, B company. A full-strength platoon has 8 vehicles with #1 belonging to the platoon commander - which leads to the conclusion that Lieutenant Lanchettes was serving as the platoon's executive officer and stepped up into the platoon commander's position after his predecessor was killed or wounded.


"322C": indicates the vehicle belongs to the 322nd Cavalry (Combat) Regiment. Since the vehicle belongs to B Troop, it would have been part of the 1st Battalion (A, B, and C troop form the 1st Battalion in a Cavalry Regiment's standard organization). Note that the "C" in "322C" represents Combat, not Cavalry. Imperial Cavalry organizations are designated as either Cavalry (Combat) or Cavalry (Recon) depending on their tactical role, and the two types of unit have different equipment and organizations.

The two horizontal lines on either side of the main armament turret indicate a platoon XO's vehicle. One line would indicate a section leader and three lines were used to designate the platoon commander's vehicle. This marking procedure was delineated in the Standing Operating Procedures for the 1949th Composite Assault Group.

The narrow white rings around the base of the Mass Driver barrel indicate that, at the time the holoimages were taken, this particular vehicle crew claimed credit for destroying fourteen enemy vehicles.

Also note that the vehicle shows clear signs of battle damage, with laser burns toward the rear of the port sponson and numerous scratches and minor gouges on the front glacis indicating superficial damage from the fragmentation effects of high explosive rounds. The vehicle's drab, lightened green camouflage paint scheme indicates that it was used in the assault on Esalin's northern hemisphere, which was in the winter season during the time of the relief operation.

M135A6 *Hoplite* Cavalry Combat Vehicle

Vehicle Data Sheet												
CraftID	01	Vehicle Name:	M135A6 <i>Hoplite</i> Cavalry Combat Vehicle (CCV)						Vehicle Illustration: (by Zach Wolfe) 			
	02	Vehicle Type:	HACV/TC (Heavy Armored Combat Vehicle / Troop Carrier)									
	03	Tech Level:	15									
	04	Total Price:	29.957 MCr (note 1)									
	05	Bulk Purchase Discount (90%):	26.961 MCr									
	06	Est. Annual Maint. Cost (10%):	02.996 MCr									
	07	Licensed Manufacturer(s):	Delgado Trading, Ling-Standard Products (notes 2 and 3)									
	08	Primary (Authorized) User(s):	Imperial Army, various sector/subsector IA formations									
Hull	01	Hull Damage Capacity:	09 DP (Inoperative) / 23 DP (Destroyed)									
	02	Unloaded Weight:	621.46 MT									
	03	Loaded Weight:	639.26 MT									
	04	Total Displacement:	9.88 Td									
	05	Configuration:	1 (Wedge) AF (Airframe)									
	06	Armor:	72G (Bonded Superdense)									
Power	01	Power Plant Damage Capacity:	02 DP (Inoperative) / 03 DP (Destroyed)						<i>Performance characteristics under Normal Maneuver (NM) power</i>			
	02	Maximum Power:	280.68 MWe									
	03	Fuel Capacity:	11.424 kl									
	04	Normal Maneuver Endurance:	5.0 full days / 15.0 work day(s) (note 8)									
	05	Combat Maneuver Endurance:	1.0 full days / 3.0 work day(s) (note 8)									
	06	Combat Weapons Endurance:	1.0 full days / 3.0 work day(s) (note 8)									
	07	Locomotion Damage Capacity:	04 DP (Inoperative) / 05 DP (Destroyed)									
Locomotion	01	Normal Maneuver Thrust:	0.9 G						<i>Performance characteristics under Combat Maneuver (CM) power</i>			
	02	Combat Maneuver Thrust:	1.7 G									
	03	Atmosphere:	Vacuum Very Thin Thin Standard Dense Very Dense									
	04	NOE:	190 kph 190 kph 190 kph 190 kph 190 kph 105 kph									
	05	Cruise:	1396 kph 1396 kph 1396 kph 1256 kph 1396 kph 314 kph									
	06	Top:	1861 kph 1861 kph 1861 kph 1675 kph 1861 kph 419 kph									
	07	Locomotion Notes:	The <i>Hoplite</i> has two power settings, normal and combat. Performance characteristics at both settings are shown.									
Communication	01	Primary:	2x Maser (max range = 50,000 km.)						<i>Sensor Scan Difficulty</i>			
	02	Alternate:	Maser (max range = 50,000 km.)									
	03	Contingency:	Laser (max range = 50,000 km.)									
	04	Emergency:	Radio (max range = 50,000 km.)									
	05	Solar Backup Power System:	A solar panel on the top deck provides backup emergency power to any one communications system (.009 MWe).									
	06	Passive EMS Targeting Array:	TL14 (range = 1 AU)									
	07	Active EMS Targeting Array:	TL14 (range = 500,000 km.)									
Weapons	01	Weapon System	Ammunition	Rounds Carried*	Pen/Att	Dmg	Max Range	Rate of Fire	Auto Targets	Danger Space	Signature	Recoil
	02	Standard Fusion Gun - Z - 15:	-	-	79/5	30	V. Distant (30)	40	2	45	H	-
	03	10MW Pulse Laser - 13:	-	-	33/3	12	V. Distant (50)	80	3	4.5	L	-
	04	RP Plasma Gun - A - 14:	-	-	44/5	20	V. Distant (5.1)	320	5	15	H	-
	05	Weapons Notes:	The <i>Hoplite</i> carries a 800-round ammunition module for the <i>Hastati</i> . This allows the platoon to internally resupply without returning to orbit or to a dirtside supply point.									
	06	Defensive DM:	N/A									
	07	Screens:	Four Smoke Dischargers									
	08	Prismatic Aerosol Dispensers:	Four Sandcasters									
	09	Computer:	Model 1 with one backup system									
	10	Holo Linked Control Panels:	3									
Control	01	Holo Heads-Up Display(s):	2						Pilot, Commander			
	02	Heads-Up Display(s):	1						Gunner			
	03	Circuit Protection:	Electronic Circuit Protection installed						Basic Environment			
	04	Environmental Controls:	Basic & Extended Life Support (note 6)						Inertial Compensators			
	05	Crew Positions (cramped):	3 (note 6)									
	06	Passenger Positions:	6									
	07	Cargo Capacity:	00.884 kl (note 7)									
	08	Fuel Capacity:	11.424 kl (note 8)									
Acc	01	Object Size:	Average									
	02	Emission Level:	Faint (note 9)									
Vehicle Description	01	The M135A6 <i>Hoplite</i> , like its partner vehicle the M133A6 <i>Hastati</i> , represents the culmination of years of technological and structural improvements over original models. The system is used to equip Imperial Army Cavalry (Combat) Regiments and a limited number of sector and sub-sector Heavy Cavalry formations. The extremely heavy armor of the <i>Hoplite</i> is capable of withstanding enemy fire up to the most modern of heavy energy weapons (Fusion-Y gun) and still reach combat speeds of in excess of 1,861 kph in vacuum. The M135A6 mounts a Fusion-Z Gun providing unsurpassed range and lethality. The <i>Hoplite</i> also carries a 10 MW Pulse Laser, mounted adjacent to the main gun, and a Rapid-Pulse Plasma gun in a retractable turret on the hull bottom. The Plasma gun mount is equipped with a state-of-the-art point defense module, providing the <i>Hoplite</i> with incomparable protection against enemy artillery and missiles. Another notable feature of the <i>Hoplite</i> is its ability to carry up to six fully-equipped soldiers into battle and insert them while still in flight (with the soldiers using grav belts to control descent). The <i>Hoplite</i> also carries an 800-round ammunition pod for the <i>Hastati</i> , easing complications of combat resupply. In addition to the protection offered by its armor and the point defense system, the vehicle is equipped with sandcasters, anti-laser aerosol dispensers, and smoke dischargers. The <i>Hoplite</i> 's sensor suite is extremely powerful, providing extraordinary battlefield awareness, and the vehicle's comm suite allows the crew to share targeting data with other units and supporting vessels in orbit. The vehicle is fully pressurized, with environmental controls, life support, and inertial compensators installed to protect the occupants in hostile environments and during high-speed maneuvers. Fuel stores allow the vehicle to maintain power for up to 136 hours in normal maneuvering conditions or 81 hours under full combat power, providing exceptional maneuvering range. Combat tested during the Fifth Frontier War, the M135A6 <i>Hoplite</i> is a superior, proven design.										

Entries in **blue** show information required in the MegaTraveller Universal Craft Profile template.

Entries in **green** are additional information provided for use by players and referees. Some of this information is based on house rules from MTU so feel free to ignore or modify it if you wish.

Note1: The M135A6 *Hoplite* CCV is an approved Imperial Joint Defense Design, accepted by the Imperial Joint Equipment Board (IIEB), so no architect's fees apply.

Note2: The system has been entered into the Imperial Supply Catalog by the Imperial Defense Logistics Board (IDLDB) as Line Item Number (LIN) V20117; Imperial Stock Number (ISN) 394-V0-105-4236.

Note3: When ordered through Imperial supply channels the system will be equipped with all listed components and meet all listed specifications. When purchased through contract from a licensed manufacturer, some component substitution and modification may be necessary. Any such modifications are subject to prior approval by the ordering agency, or the manufacturer may be found to have violated the terms of their license agreement and may consequently be subject fines and/or license revocation.

Note4: The primary maser communications systems maintain a constant link to the unit command information network & positioning system for the vehicle crew and infantry combat team. The backup maser is not powered unless a primary system fails. The laser backup is provided in case all maser systems fail. The laser system is capable of voice communication only; it does not provide the network targeting information that the maser systems provide. The radio is for emergency use only, but is powered during normal operations as a signals-intelligence collection source to pick up and record enemy broadcasts for analysis.

Note5: With the 800-round ammunition pod removed, the *Hoplite* is capable of 1.78 G maneuver thrust, increasing top vacuum speed to 1,932 kph and top standard atmosphere speed to 1,739 kph. Alternatively, with the ammunition pod removed, the *Hoplite* can carry 32.0 kl (approximately 2.37 displacement tons) in additional cargo.

Note6: Basic and Extended Life Support does not extend to the vehicle's fuel tanks. Crew position space is doubled to support extended operations (more than 8 hours) but passenger positions are not.

Note7: 0.884 kl of space is allocated for storing equipment used by the dismount infantry team. Space for storing vehicle Basic Issue Items (BII) and Crew Equipment is designated in the Fuel & Miscellaneous Section, lines 04 and 05 of the Vehicle Design Worksheet. A detailed listing of crew equipment and BII is provided on the following page.

Note8: Operating solely in Normal Maneuver mode, the vehicle has a maximum endurance of 136 hours (5.67 days). When operating at full power, the vehicle has a maximum endurance of 81 hours (3.39 days).

Note9: Note that installed Electromagnetic Masking (EMM) reduces emission level by one, but this is cancelled by the small size of the vehicle's hull which increases the emission level by one.

This depiction of a M135A6 *Hoplite* is based on a holoimage taken during combat operations on *Mithril* (Spinward Marches, 1628) during the Fifth Frontier War. The source holoimage was released on 285-1109, but the image was captured some time earlier in the year. The exact date of the image cannot be established because wartime holographers were not allowed to enable the holorecorder's date stamp function for security reasons. The exact location of the image is also unknown, but many unit details can be determined from the vehicle's markings. Although the original image was somewhat indistinct, it is nevertheless valuable because the subject vehicle was undergoing operator maintenance at the time, so some vehicle details usually not depicted can be shown here.

This vehicle image is also remarkable because it depicts the abortive attempt to increase the armor protection on the *Warrior*-class vehicles. Although the level of armor protection on the A6-models is impressive, they still can be penetrated by the latest incarnation of the fusion gun (the FZ models). The image shows applique armored skirts intended to address this shortcoming. The experimental skirts were provided to the 322nd Cavalry (Combat) Regiment for testing shortly after the A6-models were fielded (early in 1109), and the 3rd Squadron took these kits with them into combat against the Sword Worlders. However, unit after-action reports stated that the added protection provided by the skirts was unnecessary and the added weight significantly reduced vehicle performance. Production of the skirts was subsequently discontinued.

M135A6 Hoplite Cavalry Combat Vehicle

Vehicle Equipment Storage Details

S	L	Basic Issue Item Specification	V	f	Pc	Volume	Weight	Cost
BII List	01	Operator's Maintenance Tool Kit (with carrying case)	-	-	-	000.0219 kl	000.0098 MT	90 Cr
	02	Dry Chemical Fire Extinguisher (small)	-	-	-	000.0056 kl	000.0013 MT	17 Cr
	03	Vehicle First Aid Kit (with carrying case)	-	-	-	000.0030 kl	000.0013 MT	26 Cr
	04	3 Bailout Packs (Basic Survival Gear in a small backpack)	-	-	-	000.1263 kl	000.0505 MT	4,284 Cr
	05	3 Escape and Evasion Kits (Items carried on a mesh vest)	-	-	-	000.0474 kl	000.0132 MT	3,720 Cr
	06	BII Package Totals:					000.2042 kl	000.0761 MT

S	L	Individual Equipment Specification	V	f	Pc	Volume	Weight	Cost
Eeq List	01	Combat Armor (TL11 model with modernization package)	-	-	-	000.0029 kl	000.0018 MT	20,000 Cr
	02	Semiautomatic Shotgun (with folding stock)	-	-	-	000.0037 kl	000.0037 MT	250 Cr
	03	Standard Equipment Kit	-	-	-	000.0016 kl	000.0080 MT	6,060 Cr
	04	BII Package Totals:					000.0082 kl	000.0135 MT

Wt	Bailout Pack Contents	Price
02.0	Backpack (Capacity = .04 m3)	150 Cr
01.0	2 Spare UHP oxygen tanks (12 hours each)	400 Cr
00.9	Sleeping Bag (Lightweight)	120 Cr
02.3	Tent (Lightweight, 1-man, water resistant)	150 Cr
01.0	Tarp (Waterproof, 1-side reflectorized)	400 Cr
00.5	Filter Mask (for tainted atmospheres)	010 Cr
00.5	Food (concentrated, barely edible - 10 days)	050 Cr
00.1	Cold Light Sticks (10 - 24 hours each)	020 Cr
-	Cord (2mm x 300m)	010 Cr
02.5	Rope (Lightweight, high tension, 50 meters)	050 Cr
05.4	2x Large Capacity Water Bags (2 liters each)	040 Cr
-	Water Purification Tablets (50 - 1 liter each)	005 Cr
-	Misc (matches, tinder, fish hooks & line, etc)	005 Cr
00.6	Survival Knife (heavy - for cutting and chopping)	018 Cr
16.8		1428 Cr

Wt	Escape & Evasion Vest Contents	Price
00.9	Vest (Adjustable with pouches for contents)	100 Cr
00.6	Snub Pistol (Automatic - military model)	600 Cr
01.0	2x 20-round magazines (10mm HEAP)	020 Cr
00.5	1x 20-round magazine (10mm HE)	020 Cr
00.5	1x 20-round magazine (10mm Tranq)	020 Cr
00.3	Inertial Locator	200 Cr
00.1	Radio Communicator (Earpiece - 50 km range)	250 Cr
00.5	2x Signal Flares	020 Cr
-	Small Mirror (Coated metal - unbreakable)	010 Cr
04.4		1240 Cr

Wt	Standard Equipment Kit (attaches to armor)	Price
04.5	48 Shotgun Rounds (slugs, pellets, tranq, gas)	060 Cr
01.5	Laser Communicator (500 km range)	2500 Cr
02.0	PRIS Binoculars	3500 Cr
08.0		6060 Cr

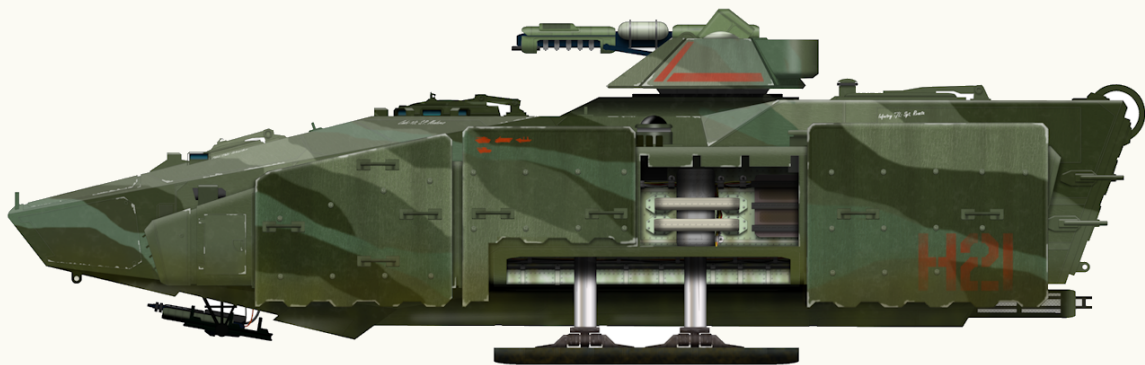
Equipment Outfitting Notes
1. The Infantry Combat Team (ICT - 6 soldiers) carried in the Hoplite has .884 kl of space allocated for storing equipment.
2. The ICT soldiers wear TL14 Combat Armor with integral grav belts and carry a mix of Gauss Weapons, Lasers, Grenade Launchers, and Plasma Guns.
3. The Hoplite's crew of three wears pressure suits during normal flight operations. They have older model combat armor available for dismounted operations, when necessary. In addition, bailout packs and E&E Vests are stowed in the vehicle for use in emergencies. These emergency stores include a shotgun and a snub pistol and ammunition for both.

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M135A6 Hoplite CCV

3rd Squadron, 322nd Cavalry (Combat)
Mithril, Spinward Marches (285-1109)



This depiction of a M135A6 Hoplite is based on a holimage taken during combat operations on Mithril (Spinward Marches, 1628) during the Fifth Frontier War. Although the original image was somewhat indistinct, it is nevertheless valuable because the subject vehicle was undergoing operator maintenance at the time, so some vehicle details usually not depicted can be shown here. This vehicle image is also remarkable because it depicts the abortive attempt to increase the armor protection on the Warrior-class vehicles. The image shows appliqué armored skirts intended to address this shortcoming. However, unit after-action reports unanimously showed that the added protection provided by the skirts was unnecessary and the added weight significantly reduced vehicle performance. Production of the skirts was subsequently discontinued. The vehicle depicted is that of the platoon commander, second platoon, H troop, 3rd Squadron - 322nd Cavalry (Combat), attached to the 1907th Composite Assault Group for action with the 214th Fleet in the "metal" systems in the Sword Worlds Subsector. The names stenciled on the vehicle indicate that the crewmembers were: Commander - Captain S. D. Menderes, Pilot - Chief Warrant Officer 2 Schneider, Gunner - Sergeant Vinit, and Infantry Team Leader - Sergeant Renata. The initial assault on Mithril resulted in a sharp but short combat action with few casualties in the assault force. This image was taken during the lull that followed establishing the initial lodgment, as units prepared for the next phase of the invasion. One of the armored skirts has been removed to service the grav modules in the port sponson and the landing skids are deployed to lift the vehicle off of the ground for maintenance. Note that the skids are normally not used in combat, as the barely visible scrapes from belly-landings indicate. The image also shows the point defense turret on the vehicle's chin, partially deployed for maintenance.

This vehicle design is © Michael Barger & the vehicle image is © Zach Wolfe. Permission is granted to reproduce this information for personal use.

This depiction of a M135A6 Hoplite is based on a holoimage taken during combat operations on *Mithril* (Spinward Marches, 1628) during the Fifth Frontier War. The source holoimage was released on 285-1109, but the image was captured some time earlier in the year. The exact date of the image cannot be established because wartime holographers were not allowed to enable the holorecorder's date stamp function for security reasons. The exact location of the image is also unknown, but many unit details can be determined from the vehicle's markings. Although the original image was somewhat indistinct, it is nevertheless valuable because the subject vehicle was undergoing operator maintenance at the time, so some vehicle details usually not depicted can be shown here.

This vehicle image is also remarkable because it depicts the abortive attempt to increase the armor protection on the *Warrior*-class vehicles. Although the level of armor protection on the A6-models is impressive, they still can be penetrated by the latest incarnation of the fusion gun (the FZ models). The image shows applique armored skirts intended to address this shortcoming. The experimental skirts were provided to the 322nd Cavalry (Combat) Regiment for testing shortly after the A6-models were fielded (early in 1109), and the 3rd Squadron took these kits with them into combat against the Sword Worlders. However, unit after-action reports stated that the added protection provided by the skirts was unnecessary and the added weight significantly reduced vehicle performance. Production of the skirts was subsequently discontinued.

The vehicle depicted is that of the platoon commander, second platoon, H troop, 3rd Squadron - 322nd Cavalry (Combat), attached to the 1907th Composite Assault Group for action with the 214th Fleet in the "metal" systems in the Sword Worlds Subsector. The names stenciled on the vehicle indicate that the crewmember were: Commander - Captain (CPT) S. D. Menderes, Pilot - Chief Warrant Officer 2 (CW2) Schneider, Gunner - Sergeant Vinit, and Infantry Team Leader - Sergeant Renata.

The initial assault on Mithril resulted in a sharp but short combat action with few casualties in the assault force. This image was taken during the lull that followed establishing the initial lodgment, as units prepared for the next phase of the invasion. One of the armored skirts has been removed to service the grav modules in the port sponson and the landing skids are deployed to lift the vehicle off of the ground for maintenance. Note that the skids are normally not used in combat, as the barely visible scrapes from belly-landings indicate. The image also shows the point defense turret on the vehicle's chin, partially deployed for maintenance. The jump platform (in stowed position) is also visible under the troop door on the vehicle's rear face. This platform is extended to allow the infantry team to dismount while the vehicle is in flight, (they use grav belts to control their descent to the planet's surface).

The meaning of the various vehicle markings are as follows:

"H21": indicates that this is the 1st vehicle of 2nd platoon, H troop. The red markings indicate that it is part of 3rd Squadron of the 322nd Cavalry (Combat) Regiment (1st Squadron used white, 2nd yellow, 3rd red, and 4th blue). Also, troops are normally given letter designations in sequence across the regiment, so G, H, and I troop belong to 3rd Squadron.

The vertical and horizontal lines on the main armament turret indicate that the vehicle is one of the two forming "A" Section. A platoon of eight vehicles subdivides into four sections each designated by a letter. The Standing Operating Procedures of the 1907th Composite Assault Group specify use of the L-shaped symbol to designate "A" section. A second horizontal line attached to the midpoint of the vertical line would indicate "B" section. A second horizontal line attached to the top of the vertical line was used for "C" section and three horizontal lines (forming the letter E) were used to designate "D" section.

The red silhouettes at the top leading edge of the second armor skirt indicate that the crew claimed credit for destroying four enemy vehicles in the planetary assault. The silhouettes are hand-painted and the holoimage is of relatively low resolution, so it is difficult to determine exactly what the enemy vehicles were. However, they appear to be two tanks, one armored personnel carrier, and one aircraft.

M109A6 *Prodomoi* Cavalry Reconnaissance Vehicle

Vehicle Data Sheet													
CraftID	01	Vehicle Name: M109A6 <i>Prodomoi</i> Cavalry Reconnaissance Vehicle (CRV)									Vehicle Illustration:(To be posted)		
	02	Vehicle Type: LACRV (Light Armored Combat / Reconnaissance Vehicle)											
	03	Tech Level: 15											
	04	Total Price: 11.569 MCr (see note 1)											
	05	Bulk Purchase Discount (90%): 10.412 MCr											
	06	Est. Annual Maint. Cost (10%): 01.157 MCr											
	07	Licensed Manufacturer(s): Ling-Standard Products, Sternmetal Horizons (see notes 2 and 3)											
	08	Primary (Authorized) User(s): Imperial Marines, Imperial Army, (no sector/subsector users as of pub date)											
Hull	01	Hull Damage Capacity: 03 DP (Inoperative) / 06 DP (Destroyed)											
	02	Unloaded Weight: 175.43 MT											
	03	Loaded Weight: 175.69 MT											
	04	Total Displacement: 2.27 Td											
	05	Configuration: 1 (Wedge) AF (Airframe)											
	06	Armor: 68G (Bonded Superdense)											
Power	01	Power Plant Damage Capacity: 02 DP (Inoperative) / 02 DP (Destroyed)			Performance characteristics under Normal Maneuver (NM) power								
	02	Maximum Power: 85.69 MWe			Thrust: 0.90 G								
	03	Fuel Capacity: 02.931 kl			Atmospher								
	04	Normal Maneuver Endurance: 02 full days / 07 work day(s)			e: 190 kph 190 kph 190 kph 190 kph 182 kph 061 kph								
	05	Combat Maneuver Endurance: 00 full days / 02 work day(s)			NOE: 810 kph 810 kph 810 kph 729 kph 547 kph 182 kph								
	06	Combat Weapons Endurance: 00 full days / 01 work day(s)			Top: 1080 kph 1080 kph 1080 kph 972 kph 729 kph 243 kph								
Locomotion	01	Locomotion Damage Capacity: 02 DP (Inoperative) / 03 DP (Destroyed)			Performance characteristics under Combat Maneuver (CM) power								
	02	Normal Maneuver Thrust: 0.9 G			Thrust: 2.00 G								
	03	Combat Maneuver Thrust: 2.0 G			Atmospher								
	04	Locomotion Notes: The <i>Prodomoi</i> has two power settings, normal and combat. Performance characteristics at both settings are shown.			e: 190 kph 190 kph 190 kph 190 kph 190 kph 119 kph								
	05				NOE: 1590 kph 1590 kph 1590 kph 1431 kph 1073 kph 358 kph								
	06				Top: 2120 kph 2120 kph 2120 kph 1908 kph 1431 kph 477 kph								
Communication	01	(see note 4) Primary: Maser (max range = 50,000 km.)			01				Passive EMS Targeting Array: TL14 (range = 1 AU)				Sensor Scan Difficulty
	02	Alternate: Maser (max range = 50,000 km.)			02				Active EMS Targeting Array: TL14 (range = 500,000 km.)				Passive Object Scan = Routine
	03	Contingency: Laser (max range = 50,000 km.)			03				Active EMS Jamming Array: TL14 (range = 500,000 km.)				Passive Object Pin = Routine
	04	Emergency: Radio (max range = 50,000 km.)			04				Low Pen Densitometer: TL15 (250 m. penetration)				Passive Energy Scan = Routine
	05	Solar Backup Power System: A solar panel on the top deck provides backup emergency power to any one communications system (.009 MWe).			05				Neutrino Sensor: TL14 (min magnitude = .01 MW)				Passive Energy Pin = Routine
	06				06				Neural Activity Sensor: TL15 (max range = very long)				Active Object Scan = Routine
	07				07				Magnetic Sensor: TL15 (max range = very distant)				Active Object Pin = Routine
Offense	01	Weapon System		Ammunition	Rounds Carried	Pen/Att	Dmg	Max Range	Rate of Fire	Auto Targets	Danger Space	Signature	Recoil
	02	Standard Fusion Gun - Y - 14:		-	-	71/5	30	V. Distant (21)	40	2	45	H	-
	03	10MW Pulse Laser - 13:		-	-	33/3	12	V. Distant (50)	80	3	4.5	L	-
	04	Weapons Notes: Due to high energy requirements, only one weapon may be fired at a time. Switching to the Fusion Gun on the gunner's control panel powers down the Pulse Laser.											
Defense	01	Defensive DM: N/A (only for space craft)											
	02	Screens: Two Smoke Dischargers											
	03	Two Prismatic Aerosol Dispensers											
	04	Two Sandcasters											
Control	01	Computer: Model 0/bis with one backup system											
	02	Holo Linked Control Panels: 1											
	03	Holo Heads-Up Display(s): 1											
	04	Circuit Protection: Electronic Circuit Protection installed											
	05	Environmental Controls: Basic Environment											
	06	Basic Life Support (fuel tanks exempt)											
	07	Inertial Compensators											
Ax	01	Crew Positions (cramped): 1											
	02	Passenger Positions: none											
Other	01	Cargo Capacity: 00.055 kl											
	02	Fuel Capacity: 02.931 kl											
	03	Object Size: Average											
	04	Emission Level: Faint (note 5)											
Vehicle Description													
01 Vehicle Description: When fielded, the M104A6 <i>Velite</i> CRV proved to be very well-suited to scout/reconnaissance													
02 missions but somewhat lacking in the firepower necessary for cavalry screen/guard/covering force operations. At the													
03 same time, the Imperial Marines were considering the <i>Velite</i> to equip the armored companies of fleet marine regiments.													
04 While the IM was impressed with the <i>Velite</i> 's capabilities, especially given the vehicle's small volume, the marines were													
05 concerned that the <i>Velite</i> 's plasma gun lacked the range and penetration for the engagements it was being considered for. To													
06 better fulfill Imperial Army and Marine requirements, the Imperial Joint Equipment Board (IJE) contracted for a modified													
07 version of the M104A6, replacing the plasma gun with a Standard Fusion Gun - Y. The IJE designated the new model M109A6													
08 and named it the <i>Prodomoi</i> in keeping with the naming convention of <i>Warrior</i> -class vehicles. Like the													
09 <i>Velite</i> , the <i>Prodomoi</i> 's weapon systems are housed in a remote turret along with a TL15 point defense targeting													
10 module and the vehicle's sensors and defensive projectors (smoke, sand, and prismatic aerosols). The vehicle's single													
11 crewman is housed in the hull, where a computer model 0/bis and holographic heads-up display allow him to control													
12 both the vehicle and mounted weapons systems. The <i>Prodomoi</i> retains the <i>Velite</i> 's suite of passive and active sensors													
13 to gather intelligence, and communication systems to relay that information through the command information network													
14 and positioning system. On-board fuel allows for 54 hours of continuous operations at the normal maneuver power													
15 setting (top speed 1,080 kph), and full power sprint (2,120 kph) for 16 hours. Fully-outfitted (less fuel), the <i>Prodomoi</i>													
16 costs MCr 11.569, slightly more than a <i>Velite</i> (at MCr 11.396). However, for the troopers of the Imperial Army and													
17 Marines, the increased cost is easily justified by the <i>Prodomoi</i> 's combat capabilities and long-term survivability.													

Entries in blue show information required in the MegaTraveller Universal Craft Profile template.

Entries in green are additional information provided for use by players and referees. Some of this information is based on house rules from MTU so feel free to ignore or modify it if you wish.

Note1: The M109A6 *Prodomoi* CRV is an approved Imperial Joint Defense Design, accepted by the Imperial Joint Equipment Board (IJE), so no architect's fees apply.

Note2: The system has been entered into the Imperial Supply Catalog by the Imperial Defense Logistics Board (IDL) under Line Item Number (LIN) V24014 or Imperial Stock Number (ISN) 394-V0-101-4914.

Note3: When ordered through Imperial supply channels the system will be equipped with all listed components and meet all listed specifications. When purchased through contract from a licensed manufacturer, some component substitution and modification may be necessary. However, any such modifications are subject to prior approval by the ordering agency or the manufacturer may be found to have violated the terms of their license agreement and may thereafter be subject fines and/or license revocation.

Note4: The primary maser communications system maintains a constant link to the higher command information network & positioning system. The backup maser is not powered unless the primary system fails. The laser backup is provided in case both maser systems fail. The laser system is capable of voice communication only; it does not provide the network targeting information that the maser systems provide. The radio is for emergency use only, but is powered during normal operations as a signals-intelligence collection source to pick up and record enemy broadcasts for analysis.

Note5: The M109A6 *Prodomoi* CRV is equipped with an electromagnetic masking package, reducing its emission level.

M104A6 *Velite* Cavalry Reconnaissance Vehicle

Vehicle Data Sheet													
CraID	01	Vehicle Name: M104A6 <i>Velite</i> Cavalry Reconnaissance Vehicle (CRV)									Vehicle Illustration:(To be posted)		
	02	Vehicle Type: LACRV (Light Armored Combat / Reconnaissance Vehicle)											
	03	Tech Level: 15											
	04	Total Price: 11.396 MCr (note 1)											
	05	Bulk Purchase Discount (90%): 10.256 MCr											
	06	Est. Annual Maint. Cost (10%): 01.140 MCr											
	07	Licensed Manufacturer(s): Delgado Trading, Ling-Standard Products (notes 2 and 3)											
	08	Primary (Authorized) User(s): Imperial Marines, Imperial Army, (few sector/subsector users)											
Hull	01	Hull Damage Capacity: 03 DP (Inoperative) / 06 DP (Destroyed)											
	02	Unloaded Weight: 174.76 MT											
	03	Loaded Weight: 175.00 MT											
	04	Total Displacement: 2.26 Td											
	05	Configuration: 1 (Wedge) AF (Airframe)											
	06	Armor: 68G (Bonded Superdense)											
Power	01	Power Plant Damage Capacity: 02 DP (Inoperative) / 02 DP (Destroyed)			Performance characteristics under Normal Maneuver (NM) power								
	02	Maximum Power: 86.28 MWe			Thrust: 0.90 G								
	03	Fuel Capacity: 02.929 kl			Atmospher								
	04	Normal Maneuver Endurance: 02 full days / 07 work day(s)			e: Vacuum 190 kph, Very Thin 190 kph, Thin 190 kph, Standard 190 kph, Dense 182 kph, Very Dense 061 kph								
	05	Combat Maneuver Endurance: 00 full days / 02 work day(s)			NOE: 810 kph, 810 kph, 810 kph, 729 kph, 547 kph, 182 kph								
	06	Combat Weapons Endurance: 00 full days / 01 work day(s)			Top: 1080 kph, 1080 kph, 1080 kph, 972 kph, 729 kph, 243 kph								
Locomotion	01	Locomotion Damage Capacity: 02 DP (Inoperative) / 03 DP (Destroyed)			Performance characteristics under Combat Maneuver (CM) power								
	02	Normal Maneuver Thrust: 0.9 G			Thrust: 2.00 G								
	03	Combat Maneuver Thrust: 2.0 G			Atmospher								
	04	Locomotion Notes: The <i>Velite</i> has two power settings, normal and combat. Performance characteristics at both settings are shown.			e: 190 kph, 190 kph, 190 kph, 190 kph, 190 kph, 119 kph								
	05				NOE: 1590 kph, 1590 kph, 1590 kph, 1431 kph, 1073 kph, 358 kph								
	06				Top: 2120 kph, 2120 kph, 2120 kph, 1908 kph, 1431 kph, 477 kph								
Communication	01	(note 4) Primary: Maser (max range = 50,000 km.)			01		Passive EMS Targeting Array: TL14 (range = 1 AU)			Sensor Scan Difficulty			
	02	Alternate: Maser (max range = 50,000 km.)			02		Active EMS Targeting Array: TL14 (range = 500,000 km.)			Passive Object Scan = Routine			
	03	Contingency: Laser (max range = 50,000 km.)			03		Active EMS Jamming Array: TL14 (range = 500,000 km.)			Passive Object Pin = Routine			
	04	Emergency: Radio (max range = 50,000 km.)			04		Low Pen Densitometer: TL15 (250 m. penetration)			Passive Energy Scan = Routine			
	05	Solar Backup Power System: A solar panel on the top deck provides backup emergency power to any one communications system (.009 MWe).			05		Neutrino Sensor: TL14 (min magnitude = .01 MW)			Passive Energy Pin = Routine			
	06				06		Neural Activity Sensor: TL15 (max range = very long)			Active Object Scan = Routine			
	07				07		Magnetic Sensor: TL15 (max range = very distant)			Active Object Pin = Routine			
Offense	01	Weapon System		Ammunition	Rounds Carried	Pen/Att	Dmg	Max Range	Rate of Fire	Auto Targets	Danger Space	Signature	Recoil
	02	RP Plasma Gun - A - 14:		-	-	44/5	20	V. Distant (5.1)	320	5	15	H	-
	03	10MW Pulse Laser - 13:		-	-	33/3	12	V. Distant (50)	80	3	4.5	L	-
	04	Weapons Notes: Due to high energy requirements, only one weapon may be fired at a time. Switching to the Plasma Gun on the gunner's control panel powers down the Pulse Laser.											
Defense	01	Defensive DM: N/A (only for space craft)											
	02	Screens: Two Smoke Dischargers											
	03	Two Prismatic Aerosol Dispensers											
	04	Two Sandcasters											
Control	01	Computer: Model 0/bis with one backup system											
	02	Holo Linked Control Panels: 1											
	03	Holo Heads-Up Display(s): 1											
	04	Circuit Protection: Electronic Circuit Protection installed											
	05	Environmental Controls: Basic Environment											
	06	Basic Life Support (fuel tanks exempt)											
	07	Inertial Compensators											
Axz	01	Crew Positions (cramped): 1											
	02	Passenger Positions: none											
Other	01	Cargo Capacity: 00.033 kl											
	02	Fuel Capacity: 02.929 kl											
	03	Object Size: Average											
	04	Emission Level: Faint (note 5)											
				Vehicle Description									
				01 Vehicle Description: The M104A6 <i>Velite</i> CRV is a heavy armored scout/reconnaissance vehicle designed to gather targeting									
				02 data ahead of the main assault force and to participate in cavalry screen/guard/covering force operations. The vehicle is									
				03 armored to withstand enemy fire up to a Fusion Gun - X and all but the very largest CPR weapon systems and									
				04 has the advantage of superior speed to enhance survivability in situations where enemy capabilities are not precisely									
				05 known. The <i>Velite</i> 's weapon systems are housed in a remote turret while the single crewman is housed in the hull,									
				06 where a computer model 0/bis and holographic heads-up display allow him to control both the vehicle and weapons									
				07 systems. The turret mounts two primary weapon systems, a 10 MW Pulse Laser (TL13) and a Rapid-Pulse Plasma Gun A (TL14)									
				08 both served by a TL15 Point Defense targeting module. A defensive suite, consisting of dual smoke dischargers,									
				09 prismatic aerosol dispensers, and sandcasters, provides additional protection. Though much smaller than the other									
				10 vehicles in the <i>Warrior</i> -class of heavy armor, the <i>Velite</i> shares numerous components with its heavier cousins and uses									
				11 the same naming convention. Like other vehicles in the <i>Warrior</i> -class, the <i>Velite</i> is equipped with a full suite of passive									
				12 and active sensors to gather intelligence, and communication systems to relay that information through the command									
				13 information network and positioning system. On-board fuel allows for 54 hours of continuous operations at the normal									
				14 maneuver power setting (top speed 1,080 kph), and full power sprint (2,120 kph) for 16 hours. All of this capability comes at									
				15 a steep price, with a fully-outfitted vehicle (less fuel) costing MCr 11.396. However, the Imperial Army									
				16 and Marines consider the cost to be justified, as few reconnaissance vehicle systems in current service can match the									
				17 long-term survivability of the <i>Velite</i> .									

Entries in blue show information required in the MegaTraveller Universal Craft Profile template.

Entries in green are additional information provided for use by players and referees. Some of this information is based on house rules from MTU so feel free to ignore or modify it if you wish.

Note1: The M104A6 *Velite* CRV is an approved Imperial Joint Defense Design, accepted by the Imperial Joint Equipment Board (IJEb), so no architect's fees apply.

Note2: The M104A6 has been entered into the Imperial Supply Catalog by the Imperial Defense Logistics Board (IDLb) under Line Item Number (LIN) V22926 or Imperial Stock Number (ISN) 394-V0-101-4633.

Note3: When ordered through Imperial supply channels the system will be equipped with all listed components and meet all listed specifications. When purchased through contract from a licensed manufacturer, some component substitution and modification may be necessary. However, any such modifications are subject to prior approval by the ordering agency or the manufacturer may be found to have violated the terms of their license agreement and may thereafter be subject fines and/or license revocation.

Note4: The primary maser communications system maintains a constant link to the higher command information network & positioning system. The backup maser is not powered unless the primary system fails. The laser backup is provided in case both maser systems fail. The laser system is capable of voice communication only; it does not provide the network targeting information that the maser systems provide. The radio is for emergency use only, but is powered during normal operations as a signals-intelligence collection source to pick up and record enemy broadcasts for analysis.

Note5: The M104A6 *Velite* CRV is equipped with an electromagnetic masking package, reducing its emission level.

Writing for Frontier Report

At present we can accept submissions for any non mongoose publishing version of Traveller as this fanzine complies with the Far Future Enterprises Fair Use Policy. Our preference is to accept submissions that support the D6 rule sets, such as Classic Traveller, MegaTraveller and Marc Miller's Traveller T4, as these are the easiest to convert rules between. This does not mean that we won't publish materials for Traveller 20 or Traveller The New Era, Gurps Traveller etc, it just means that we prefer the D6 rules.

We can accept submissions on word documents (including office 2007 format), open office format and PDF.

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All submissions will be edited if required and if not appropriate will be rejected, (so don't try to sneak anything in under the radar) as our Tech 15 Battlefield Sensors are State of the Art and do not miss a trick....

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At present we are looking for:

- Adventures
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- Amber Zones
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Kerr/Masila subsector background - GDW Traveller: The New Era, Main Rule Book
- GDW Knightfall,

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