

Traveller Starship Tech

This chapter contains information from the simplified construction chapter, and adds additional information, writeups, more gadgets, and some alternatives GMs may use when building starships.

Ship Construction

Space ships are constructed and sold at shipyards throughout the galaxy. Any class A starport has a shipyard which can build any kind of ship, including starships with jump drives; any class B starport can build small craft and ships which do not have jump drives.

The military procures vessels through these shipyards, corporations buy their commercial vessels from them, and private individuals can purchase ships that they have designed through them as well. The major restriction on the purchase of ships is money.

The words vessel, ship, starship, non-starship, and small craft are used with special significance when referring to space travel. A **vessel** is any interplanetary or interstellar vehicle. A **ship** is any vessel of 100 tons or more. A **starship** is a ship which has jump drives and can travel on interstellar voyages. A **non-starship** is a ship without jump drives. A **small craft** is any vessel under 100 tons; all small craft are incapable of jump.

Ship Design

The Traveller approach to ship building is a modular one. It takes advantage of the concept that mass-produced designs can be built faster and cheaper than new designs. It's much cheaper to buy a ship based on the Far Trader shell, for example, than to build a similarly-sized and equipped vessel of a brand new design.

Most vessels are constructed from standard design plans which use time-tested designs and combinations of features. Shipyards work from these plans which cover every detail of construction and assembly.

Small design corporations can produce design plans for any vessel type once given the details of what is desired. The design procedure is followed to determine what is available and allowed, and the results are presented to the naval architect firm. They produce a detailed set of design plans in about four weeks for a price of 1% of the final ship cost; they can be hurried to finish the job in two weeks if paid 1.5% of the final ship cost. Once the design plans are received, the shipyard may be commissioned to produce the vessel desired.

STANDARD DESIGNS

There are a number of standard design plans available; they have been in use for a long time, and are available for a nominal fee (Cr100 for the set).

STARSHIP DESIGNS

Standard starship plans available are:

Scout. 100 tons. Jump2, 2G, 40 tons fuel. Model/1bis. 4 staterooms, 1 hardpoint (double turret), Air/raft. 3 tons cargo. Streamlined, 1 crew. MCr29.43; 9 months.

Free Trader. 200 tons. Jump1, 1G. 30 tons fuel. Model/1, 10 staterooms, 20 low. 2 hardpoints. 82 tons cargo. Stream-

lined. 4 crew. MCr37.08; 11 months.

Safari Ship. 200 tons. Jump2, 1G. 60 tons fuel. Model/1bis. 11 staterooms. 1 hardpoint (double turret). Air/raft, launch. 6 tons cargo. 2 capture tanks; 1 lounge. Streamlined. 5 crew. MCr81.08; 11 months.

Yacht. 200 tons. Jump1, 1G. 50 tons fuel (allows two successive jump1). Model/1. 14 staterooms. 1 hardpoint. ATV, air/raft, ship's boat. 11 tons cargo. Unstreamlined. 4 crew. MCr51.057; 11 months.

Subsidized Merchant. 400 tons. Jump1, 1G. 50 tons fuel. Model/1. 13 staterooms, 9 low. 2 hardpoints. Launch. 200 tons cargo. Streamlined. 5 crew. MCr101.03; 14 months.

Patrol Cruiser. 400 tons. Jump3, 4G. 160 tons fuel. Model/3. 12 staterooms, 4 low berths. 4 hardpoints (2 triple missile turrets, 2 triple laser turrets). Ship's boat, GCarrier. 10 crew. MCr221.04; 16 months.

Laboratory Ship. 400 tons. Jump2, 1G. 90 tons fuel. Model/2. 20 staterooms. 2 hardpoints. 2 air/rafts, 1 pinnacle. 23 tons cargo. 85 tons lab space. Unstreamlined. 5 crew. MCr158.98; 14 months.

Subsidized Liner. 600 tons. Jump3, 1G. 210 tons fuel. Model/3. 30 staterooms, 20 low. 3 hardpoints. Launch. 129 tons cargo. Unstreamlined. 9 crew. MCr236.97; 22 months.

Mercenary Cruiser. 800 tons. Jump3, 3G. 318 tons fuel (48 tons reserve). Model/5. 25 staterooms. 8 hardpoints (8 triple turrets). Air/raft, 2 modular cutters (1 open module, 1 fuel module, 2 ATV modules), 2 ATVs. 80 tons cargo. Unstreamlined. 8 crew. MCr445.95; 25 months.

SMALL CRAFT DESIGNS

Standard plans are also available for the following small craft:

Fighter: 10 tons. 6G, 1 ton fuel. Model/1, one weapon (one laser, up to three missile racks, or up to three sandcasters). 1 ton cargo. 1 crew. MCr18.

Launch: 20 tons. 1G, 1 ton fuel. Model/2bis. Weapon (missile racks or sandcasters; it may not mount lasers). The craft has 13 tons excess space available for custom use. 2 crew. MCr14.

Ship's Boat: 30 tons. 6G, 1.8 tons fuel. Model/2. Weapon (one beam or pulse laser). The craft has 13.7 tons of excess space available. 2 crew. MCr16.

Slow Boat: 30 tons. 3G, 1 ton fuel. Model/2. Weapon (one beam or pulse laser). The craft has 19.9 tons of excess space. 2 crew. MCr15.

Pinnacle: 40 tons. 5G, 2 tons fuel. Model/3. Weapon (one beam or pulse laser). The craft has 22.4 tons of excess space. 2 crew. MCr20.

Slow Pinnacle: 40 tons. 2G, 1 ton fuel. Model/3. Weapon (one beam or pulse laser). The craft has 31.6 tons of excess space. 2 crew. MCr18.

Modular Cutter: 50 tons. 4G, 2 tons fuel. Model/3. Weapon (one beam or pulse laser). The craft has 30 tons committed to special detachable modules; it has 2.5 tons excess space available for weaponry, computer, and possibly a couch for a third crew member. 2 crew. MCr28.

ATV Cutter Module: The ATV module (which includes an operational ATV) is 30 tons. It can land (and retrieve) an ATV on a world surface from orbit. The module can serve as an ATV storage location, if desired. It costs MCr1.8.

Fuel Skimming Cutter Module: The fuel module, with

30 tons of fuel tankage, serves as a fuel skimming vehicle and storage tank. It costs MCr1.

Frame Cutter Module: The open module is a customizable frame with 30 tons of excess space which can be allocated to passenger couches, fuel, cargo, cabin, or staterooms. It costs MCr2.

Shuttle: 95 tons. 3G, 2.85 tons fuel. Model/3. Weapon (one beam or pulse laser). The craft has 71 tons of excess space. 2 crew. MCr33.

OTHER PLANS

Other standard plans may be available at various localities. Standard designs are easier to produce; their prices reflect a 10% reduction in normal pricing.

Standard design vessels are often available used (10 to 40 years old) at reductions in price ranging from 10% to 40%, as indicated by the GM.

Construction Times: Time required for building any vessel depends primarily on the hull. As a rough estimate, construction time is 5 Displacement Tons per day, with a minimum time of one week. The standard hulls require shorter construction times for those hulls; they are more familiar to the shipyard and easier to build.

Costs and Payments: A shipyard will insist upon a 20% down payment with the order for the vessel, as well as a demonstration that proper financing is available to cover the balance when due.

Steps

The basic steps for starship (and spaceship) construction are given below, based on Traveller. These steps are provided to make sure you include all the basics, but should be used as an aid rather than a straightjacket.

STARSHIP CONSTRUCTION STEPS

- 1. Determine the Ship's Purpose
- 2. Determine the Tech Level of the shipyard that will be building the ship.
- 3. Select a hull size, material, and configuration. Select additional hull armor if required.
- 4. Select Maneuver drive
- 5. Select Jump drive if ship is a starship.
- 6. Select Power Plant
- 7. Determine fuel tank size; add fuel scoops, fuel purification plants, and drop-tanks as desired.
- 8. Select the bridge.
- 9. Select the computer.
- 10. Select weaponry.
- 11. Select ship's vehicles if appropriate.
- 12. Determine crew needs and quarters.
- 13. Determine additional requirements, such as cargo space, passenger accommodations, low berths, laboratories, special installations, and so forth.

Purpose

One of the most basic decisions is the purpose of the vessel. Is it a merchant vessel or military vessel, in-system (spacecraft) or interstellar (starship).

Every ship is assigned a ship code based on its purpose, mission, and size. See the *Revised Imperium Ship Codes* section for more details.

REVISED IMPERIUM SHIP CODES

The original Ship Type Codes from *High Guard* were confusing (FF could be Fleet Frigate or Fast Fighter, and Merchants could be A or M). The following revised system was influenced by that found in *Terran Empire*, page 157.

The Primary (first character) indicates the type of craft; the Qualifier (second character) represents the range; and the third indicates the tonnage.

Primary	Type	Notes
B	Battle	Warship to attack other vessels
C	Carrier	Vessel to carry smaller ships
D	Destroyer	Anti-fighter warship
E	Escort	Armed escort vessel
F	Fighter	Fighter, Intruder, Interceptor
G	Frigate	Patrol ship or cruiser
H	Support	Support ships or tenders
K	Cutter	
L	Lab	Scientific vessel
M	Merchant	Passenger or cargo vessel
O	Observation	Surveillance and Spy vessels
P	Station	Administrative complex
Q	Auxiliary	Auxiliary ships
R	Refinery	Industrial material processing vessel
S	Scout	Exploration vessel
T	Transport	Barge, Tanker, or Bulk-Cargo vessel
U	Unclassified	General-purpose vessel
X	Express	Mail or courier vessel
Y	Yacht	Personal use vehicle
Z	Experimental	Experimental vessel
Qualifier	Type	Notes
G	Gig	Planet-to-ship or ship-to-ship vessel
O	Orbital	Orbital vessel
M	Maneuver	Maneuver-only (interplanetary) vessel
J	Jump	Jump-capable (interstellar) vessel
Tonnage	Value	Notes
0	0-99	Gig, Pinnace, Shuttle, Cutter, etc.
1	100 -199	Scout/Courier, Planetary Shuttle
2	200-299	
3	300-399	

Using this system, a Pinnace or Ship's Boat would be QG-0; a Modular Cutter would be KM-0; a Subsidized Liner would be MJ-6, and a Mercenary Cruiser would be TJ-6.

Technology Level

The technology level of the shipyard where the starship is built has several effects. The most obvious effect is that certain devices, such as meson guns, are only available at the higher tech level shipyards, if at all.

A secondary effect is that as the technology level of a manufactured component increases above the minimum tech level of that component, the volume used by that component decreases.

At the time of the *Third Imperium*, all civilian ships within the Third Imperium are built at the standard TL 12 level, and most military vessels are built at the TL 15 level.

In the time of *The New Era*, only the Regina sector is able to sustain the TL 12 shipyards; the Old Expanses builds at TL 11-12, due to aid from the Hivers. Other worlds affected by Virus may be at any TL below 12, and only those who have crawled back up to at least TL 9-10 have any kind of space program.

Traveller Technology

Starship technology in the Traveller universe is somewhat different from the technology in Terran Empire or Star Trek. Below are some of the key differences to keep in mind when building starships in TravellerHERO.

Average Tech Level: Prior to *The New Era*, the average Imperial Tech Level is 12, and most Imperial worlds can sustain TL 12. Imperial military shipyards can support TL 15, while commercial shipyards typically support TL 12. During *The New Era*, there are few shipyards working, and those that are typically have TL 9 at best. The exception to this is the Regency, which maintains TL 12 shipyards.

Weapons Systems: Anti Matter Missiles are advanced tech +2, standard nuclear missiles are uncommon, however detonation laser nuclear warheads see common use in space combat.

Plasma/Fusion Weapons: In Traveller, Plasma and Fusion weapons have a considerable range advantage over those in Star Hero, and the turret weapons have a higher rate of fire.

FTL Communications: FTL Communications doesn't exist at all, even for theoretical applications.

Screens and Forcefields: Screens and forcefields don't exist on a personal level until very advanced tech levels. Ships and vehicles are limited to nuclear dampers and meson screens, and late TL-15 Black Globe Generators.

Artificial Intelligence (AI): Very Limited AI until TL-15, then true AI becomes feasible

Tractor Beams and Repulsors: Tractor Beams technology has very limited usage. Tractor beams don't appear until TL-15, while at TL-13 they become available as a defensive bay weapon called Repulsors.

Teleportation/Matter Transport: Advanced Tech, experimentation starting at Late TL-15, very short range and extremely bulky with a high power requirement even at high tech levels.

Required Starship Components

Starships are constructed on the foundation of a hull, into which are fitted the drives and power plants, the fuel tankage, life support equipment, computers, controls, armaments, and other fittings that adapt it to its intended function. The total tonnage of the installed fittings cannot exceed the tonnage of the hull.

One of the most important decisions in starship construction is to use a *standard design*, a *modified standard design*, or a *new design*. When selecting a *standard design* ship, such as a Far Trader, the purchase price is 75% of the normally calculated price due to the efficiencies of mass production. A *modified standard design* ship, such as a Far Trader with modified space allocations, costs 90% of the normally calculated price. *New designs* cost 100% of the calculated cost. New starship designs are specified by navies or corporations, while individuals require the services of a naval architect to prepare plans.

Ships of 5000 Displacement Tons or less can be built in 36 months or less by any competent shipyard. Ships over 5000 Displacement Tons require from 24 to 60 months to complete, based on conditions, other orders in progress at the shipyard, and any overtime put in to reduce the building time.

The Hull

Hulls are identified by their mass displacements, expressed in tons. As a rough guide, one ton equals 2 HERO Hexes (the volume of one ton of liquid hydrogen).

When hulls are constructed, they are divided into an engineering section for the drives and the main compartment for everything else. All drives and power plants must be located in the engineering section, and only drives and power plants may be placed in that section. All other ship components, including fuel, cargo hold, living space, and computer, must be located in the main compartment.

The standard hulls table shows six standard hulls which are available at reduced prices and construction times.

Standard Hulls									
Tons	Hexes	Main	Drives	MCr	Time	STR	BODY	DCV	DEF
100	200	170	30	2	9	75	23	-8	8
200	400	340	60	8	11	85	25	-10	8
400	800	680	120	16	14	90	26	-10	8
600	1200	1020	180	48	22	95	27	-11	8
800	1600	1360	240	80	25	98	28	-12	8
1000	2000	1700	300	100	27	100	28	-12	8
Main and Drive areas given in Hexes. Time in months.									

The hulls listed above are standard sizes, readily available at the reduced prices or times shown. All others must be custom produced at MCr0.1 per ton; minimum price MCr20. See the Custom Hulls table below for details.

Hulls vary in their requirements for drives and power plants based on tonnage. Any specific drive will be less efficient as the tonnage it must drive increases.

Custom Hulls

Tons	Hexes	Main	Drives	MCr	Time	STR	BODY	DCV
10	20	17	3	1	1	50	18	-5
15	30	25.5	4.5	1.5	1.5	53	19	-5
20	40	34	6	2	2	55	19	-6
50	100	85	15	5	5	68	22	-8
100	200	170	30	10	9	75	23	-8
200	400	340	60	20	11	85	25	-10
400	800	680	120	40	15	90	26	-10
600	1200	1020	180	60	19	95	27	-11
800	1600	1360	240	80	23	98	28	-12
1000	2000	1700	300	100	27	100	28	-12
2000	4000	3400	600	200	47	108	30	-13
3000	6000	5100	900	300	67	110	30	-13
4000	8000	6800	1200	400	87	115	31	-14
5000	10000	8500	1500	500	107	118	32	-14
6250	12500	10625	1875	625	132	120	32	-14
10000	20000	17000	3000	1000	207	125	33	-15
16000	32000	27200	4800	1600	327	130	34	-16
25000	50000	42500	7500	2500	507	135	35	-16
40000	80000	68000	12000	4000	807	140	36	-17
62500	125000	106250	18750	6250	1257	145	37	-18
100000	200000	170000	30000	10000	2007	150	38	-18
160000	320000	272000	48000	16000	3207	155	39	-19
250000	500000	425000	75000	25000	5007	160	40	-20
400000	800000	680000	120000	40000	8007	165	41	-20
625000	1250000	1062500	187500	62500	12507	170	42	-20
1000000	2000000	1700000	300000	100000	20007	175	43	-21

Main and Drive areas given in Hexes.

Time in months per unit of project manpower applied. A 5000 Ton vessel takes 107 months for 1 project team to complete, but 36 months for 3 project teams working together to complete.

HULL MATERIALS

The standard ship hull is a hardened steel hull with a strength of DEF 8. While this is acceptable for low risk vessels, many space craft require a stronger material. Selecting a different hull material affects the BODY, DEF, and overall cost of the hull.

Hull Materials			
Material	BODY	DEF	Hull Cost*
Titanium alloy	+1	+1	0.032
Light Composite	+2	+1	0.036
Composite Laminate	+2	+2	0.06
Crystal Iron	+1	+3	0.072
Superdense	+2	+4	0.070
Bonded Superdense	+5	+8	0.099
Coherent Superdense	+6	+12	0.195

* = Cost in MCr per DTon of Ship. Multiply the DTons of the ship times the value in Hull Cost to find the total cost of the armor.

HULL CONFIGURATION

The hull configuration is a rough description of the shape and design of the hull. Shapes like needle or wedge, cylinder or sphere, and so forth. One configuration option is hollowing out a planetoid and fitting it with equipment to serve as a spaceship or starship.

Selecting the hull configuration or shape also affects the BODY, Credit cost, and whether the ship can be streamlined to enter atmospheres.

Hull Configuration

Hull Type	BODY	DEF	Cost*	Notes
Dispersed/Open	+4	+0	x.75	1
Needle	+3	+0	x2	2, 3(+2)
Wedge	+2	+0	x1.5	2, 3(+2)
Cylinder	+1	+0	x1.25	2, 3(+1)
Box	+1	+0	x1	2
Sphere	+0	+0	x1	2
Dome/Disk	+2	+0	x1.25	2, 3(+1)
Closed Structure	+2	+0	x1.25	1
Slab	+2	+0	x1.5	2, 3(+1)

1. Cannot Enter Atmosphere
2. Can Enter Atmosphere
3. Highly maneuverable, adds to Piloting Skill Roll
* Cost Multiplier for the Base Hull

HULL ARMOR

Additional hull armor for vessels comes in two standard varieties: full armor and ablat armor.

FULL ARMOR

Additional armor may be added to vessels, up to a maximum of +1 DEF per TL of the shipyard, at a cost of .03MCr per DTons of the vessel per +1 DEF.

TL 9 Hull Armor: The standard armor below is available for all ships at TL 9 and higher shipyards. Cost: 27MCr for a 100 DT hull; 270MCr for a 1000 DT hull.

TL 9 Hull Armor: *Armor (+9 PD/+9 ED) (27 Active Points); Limited Coverage (Hull/Frame Only; -1/4). Total Cost: 22 points.*

ABLAT ARMOR

Ships may also have ablative armor added to the outer armor (in addition to full armor), which provides additional protection but is destroyed as it takes damage. The maximum DEF of additional ablative armor is +2 DEF per TL of the shipyard, at a cost of 0.0075MCr per DTons of the vessel per +1 DEF.

TL 9 Ablat: This ablative armor can be purchased and applied at any TL 9 or above shipyard. Cost: 13.5MCr for a 100 DT hull; 135MCr for a 1000 DT hull.

TL 9 Ablat: *Armor (+18 PD/+18 ED) (54 Active Points); Ablative (-1/2), Limited Coverage (Hull/Frame Only; -1/4). Total Cost: 31 points*

The Engineering Section

Drives and power plants are installed in the engineering section.

Maneuver Drives

Maneuver Drives are the propulsion systems for normal space flight. Maneuver drives are rated in the number of Gs of acceleration, and range from 1G to 6G.

Traveller Maneuver Drives apply the limitation *Realistic END Cost: Requires STR/5 Additional END per phase (-1/2)* to represent the fact that it takes more energy to move larger masses, and it requires a larger engine to move that larger mass. For example, a 100-ton vessel has a STR of 75, which means it costs $6 + (75/5) = 21$ END per phase for 2G drive; a 1000-ton vessel has a STR of 100, which means it costs $6 +$

(100/5) = 26 END per phase for a 2G drive.

Each 1 Ton of Maneuver Drive can propel 100 Tons of vessel at 1G, and costs MCr2 per Ton of Maneuver Drive. Thus it takes 6 Tons of Maneuver Drive to propel a 100-Ton vessel at 6G, or a 200-Ton vessel at 3G, or a 600-Ton vessel at 1G. The maximum propulsion available regardless of the Maneuver Drive tonnage is 6G.

Maneuver Drives						
Hull	1G	2G	3G	4G	5G	6G
	Tons	Tons	Tons	Tons	Tons	Tons
100	1	2	3	4	5	6
200	2	4	6	8	10	12
400	4	8	12	16	20	24
600	6	12	18	24	30	36
800	8	16	24	32	40	48
1000	10	20	30	40	50	60
2000	20	40	60	80	100	120
3000	30	60	90	120	150	180
4000	40	80	120	160	200	240
5000	50	100	150	200	250	300
SPD	2	2	3	4	5	6
Flight	30"	60"	60"	60"	60"	60"
DEX	+0	+5	+8	+11	+13	+17
END	6*	12*	12*	12*	12*	12*

Hull Tons are for the vessel. The Tons for each Maneuver rating are for the Maneuver Drive. Cost is MCr2 per Ton of Maneuver Drive.
* The mass of the vessel increases the END cost by 1 per 5 STR of the vessel. A 200-ton vessel has 85 STR, so the END cost increases by (85/5) = +17; thus it takes 6 +17 = 23 END per phase to move the vessel at full velocity.

1G Maneuver Drive: *Flight 30", Position Shift (65 Active Points); OIF Bulky (-1), Costs Endurance (-1/2), Realistic END Cost: Requires STR/5 Additional END per phase (-1/2), Real Equipment (-1/4). Total Cost: 20 points.*

2G Maneuver Drive: *(Total: 140 Active Cost, 43 Real Cost) Flight 60", Position Shift (125 Active Points); OIF Bulky (-1), Costs Endurance (-1/2), Realistic END Cost: Requires STR/5 Additional END per phase (-1/2), Real Equipment (-1/4) (Real Cost: 38) plus +5 DEX (15 Active Points); OIF Bulky (-1), Linked (2G Maneuver Drive; -1/2), Real Equipment (-1/2) (Real Cost: 5)*

3G Maneuver Drive: *(Total: 159 Active Cost, 49 Real Cost) Flight 60", Position Shift (125 Active Points); OIF Bulky (-1), Costs Endurance (-1/2), Realistic END Cost: Requires STR/5 Additional END per phase (-1/2), Real Equipment (-1/4) (Real Cost: 38) plus +8 DEX (24 Active Points); OIF Bulky (-1), Linked (3G Maneuver Drive; -1/2), Real Equipment (-1/2) (Real Cost: 8) plus +1 SPD (10 Active Points); OIF Bulky (-1), Linked (3G Maneuver Drive; -1/2), Real Equipment (-1/2) (Real Cost: 3)*

4G Maneuver Drive: *(Total: 178 Active Cost, 56 Real Cost) Flight 60", Position Shift (125 Active Points); OIF Bulky (-1), Costs Endurance (-1/2), Realistic END Cost: Requires STR/5 Additional END per phase (-1/2), Real Equipment (-1/4) (Real Cost: 38) plus +11 DEX (33 Active Points); OIF Bulky (-1), Linked (4G Maneuver Drive; -1/2), Real Equipment (-1/2) (Real Cost: 11) plus +2 SPD (20 Active Points); OIF Bulky (-1), Linked (4G Maneuver Drive; -1/2), Real Equipment (-1/2) (Real Cost: 7)*

5G Maneuver Drive: *(Total: 194 Active Cost, 61 Real Cost) Flight 60", Position Shift (125 Active Points); OIF Bulky (-1), Costs Endurance (-1/2), Realistic END Cost: Requires STR/5 Additional END per phase (-1/2), Real Equipment (-1/4) (Real Cost: 38) plus +13 DEX (39 Active Points); OIF Bulky (-1), Linked (5G Drive; -1/2), Real Equipment (-1/2) (Real Cost: 13) plus +3 SPD (30 Active Points); OIF Bulky (-1), Linked (5G Drive; -1/2), Real Equipment (-1/2) (Real Cost: 10)*

6G Maneuver Drive: *(Total: 216 Active Cost, 68 Real Cost) Flight 60", Position Shift (125 Active Points); OIF Bulky (-1), Costs Endurance (-1/2), Realistic END Cost: Requires STR/5 Additional END per phase (-1/2), Real Equipment (-1/4) (Real Cost: 38) plus +17 DEX (51 Active Points); OIF Bulky (-1), Linked (6G Drive; -1/2), Real Equipment (-1/2) (Real Cost: 17) plus +4 SPD (40 Active Points); OIF Bulky (-1), Linked (6G Drive; -1/2), Real Equipment (-1/2) (Real Cost: 13)*

Maneuver Drives reached their maximum efficiency at TL 12. Maneuver drives of TL 9 and lower use double the fuel of TL 12 varieties. Above TL 12, reduce fuel usage by 5% per TL above 12, with a maximum reduction at TL15 of 15%.

JUMP DRIVES

Jump drives are a type of Displacement Drive (see *Terran Empire*, page 160). The jump travels through Hyper-space from the Jump Point to the Target Point, and all jumps take 1 week (7 days). Jump drives are the only FTL drives in Traveller.

Jump drives are quirky, and subject to misjumps. The jump drive pilot makes a *Combat Piloting* skill roll to initiate the jump, and won't know until the ship returns to normal space whether the jump was normal or missed.

Use the Piloting modifiers below to gauge the success of the jump. Modifier are added to the roll to determine whether the jump is successful or not.

Circumstance	Modifier
Jumping within 100 planetary diameters of world or star	+7
Jumping to an area with no planetary or solar masses	+2
Using unrefined or contaminated fuel	+4
Using refined fuel	-2
Operating beyond annual maintenance	+1/month cumulative
Jumping during starship combat	+4
Add the modifier to the pilot's roll to determine success. For example, Jovan rolls an 11 with his 12- Combat Piloting skill, but because the ship is using unrefined fuel, the modified roll is 11+4 = 15, which is a misjump.	

Traveller Jump Drives apply the limitation *Realistic END Cost: Requires STR/5 Additional END per phase (-1/2)* to represent the fact that it takes more energy to move larger masses, and it requires a burst of power to move that larger mass. For example, a 100-ton vessel has a STR of 75, which means it costs 28 + (75/5) = 43 END for J2 Jump; a 1000-ton vessel has a STR of 100, which means it costs 28 + (100/5) = 48 END for a J2 jump.

Each 5 Tons of Jump Drive can move 100 Tons of vessel at J1, and costs MCr2 per Ton of Jump Drive. Thus it takes 30 Tons of Jump Drive to move a 100-Ton vessel at J6, or a 200-Ton vessel at J3, or a 600-Ton vessel at J1. The maximum jump possible regardless of the Jump Drive tonnage is J6.

Jump Drives

Hull	J1 Tons	J2 Tons	J3 Tons	J4 Tons	J5 Tons	J6 Tons
100	5	10	15	20	25	30
200	10	20	30	40	50	60
400	20	40	60	80	100	120
600	30	60	90	120	150	180
800	40	80	120	160	200	240
1000	50	100	150	200	250	300
2000	100	200	300	400	500	600
3000	150	300	450	600	750	900
4000	200	400	600	800	1000	1200
5000	250	500	750	1000	1250	1500
END	12*	28*	36*	48*	60*	76*

Hull Tons are for the vessel. The Tons for each Jump rating are for the Jump Drive. Cost is MCr2 per Ton of Jump Drive. END is the power needed to ignite the hydrogen for Jump.

Jump 1 Drive: Teleportation 3", MegaScale (1" = 1 lightyear; +3 1/2), Can Be Scaled Down 1" = 1km (+1/4) (28 Active Points); Extra Time (1 Week, For Full Journey; -4 1/2), Increased Endurance Cost (x4 END; -1 1/2), OIF Bulky (-1), Requires A Combat Piloting Skill Roll (-1/2), Cannot Be Safely Used Inside A Gravity Well (-1/2), Costs Endurance (-1/2), Realistic END Cost: Requires STR/5 Additional END per phase (-1/2), Real Equipment (-1/4). Total Cost: 3 points

Jump 2 Drive: Teleportation 7", MegaScale (1" = 1 lightyear; +3 1/2), Can Be Scaled Down 1" = 1km (+1/4) (66 Active Points); Extra Time (1 Week, For Full Journey; -4 1/2), Increased Endurance Cost (x4 END; -1 1/2), OIF Bulky (-1), Requires A Combat Piloting Skill Roll (-1/2), Cannot Be Safely Used Inside A Gravity Well (-1/2), Costs Endurance (-1/2), Realistic END Cost: Requires STR/5 Additional END per phase (-1/2), Real Equipment (-1/4). Total Cost: 6 points

Jump 3 Drive: Teleportation 10", MegaScale (1" = 1 lightyear; +3 1/2), Can Be Scaled Down 1" = 1km (+1/4) (95 Active Points); Extra Time (1 Week, For Full Journey; -4 1/2), Increased Endurance Cost (x4 END; -1 1/2), OIF Bulky (-1), Requires A Combat Piloting Skill Roll (-1/2), Cannot Be Safely Used Inside A Gravity Well (-1/2), Costs Endurance (-1/2), Realistic END Cost: Requires STR/5 Additional END per phase (-1/2), Real Equipment (-1/4). Total Cost: 9 points

Jump 4 Drive: Teleportation 13", MegaScale (1" = 1 lightyear; +3 1/2), Can Be Scaled Down 1" = 1km (+1/4) (123 Active Points); Extra Time (1 Week, For Full Journey; -4 1/2), Increased Endurance Cost (x4 END; -1 1/2), OIF Bulky (-1), Requires A Combat Piloting Skill Roll (-1/2), Cannot Be Safely Used Inside A Gravity Well (-1/2), Costs Endurance (-1/2), Realistic END Cost: Requires STR/5 Additional END per phase (-1/2), Real Equipment (-1/4). Total Cost: 12 points

Jump 5 Drive: Teleportation 16", MegaScale (1" = 1 lightyear; +3 1/2), Can Be Scaled Down 1" = 1km (+1/4) (152 Active Points); Extra Time (1 Week, For Full Journey; -4 1/2), Increased Endurance Cost (x4 END; -1 1/2), OIF Bulky (-1), Requires A Combat Piloting Skill

Roll (-1/2), Cannot Be Safely Used Inside A Gravity Well (-1/2), Costs Endurance (-1/2), Realistic END Cost: Requires STR/5 Additional END per phase (-1/2), Real Equipment (-1/4). Total Cost: 15 points

Jump 6 Drive: Teleportation 20", MegaScale (1" = 1 lightyear; +3 1/2), Can Be Scaled Down 1" = 1km (+1/4) (190 Active Points); Extra Time (1 Week, For Full Journey; -4 1/2), Increased Endurance Cost (x4 END; -1 1/2), OIF Bulky (-1), Requires A Combat Piloting Skill Roll (-1/2), Cannot Be Safely Used Inside A Gravity Well (-1/2), Costs Endurance (-1/2), Realistic END Cost: Requires STR/5 Additional END per phase (-1/2), Real Equipment (-1/4). Total Cost: 18 points

POWER PLANTS

Power Plants provide power to the ship's systems: maneuver and jump drives, life support, computers, sensors, weapons and defenses, and so forth. The bigger the ship, the larger its power usage.

Power Plants are rated from P1 to P6, which indicates the maximum drive they can support. In all cases, the power plant must equal or exceed the higher of the maneuver drive and the jump drive letter. For example, a ship that has 3G Maneuver Drive and J1 Jump Drive must have at least a P3 power plant; a ship that has a 1G Maneuver Drive and a J2 Jump Drive must have at least a P2 power plant.

Each 1 DT of Power Plant provides 50 END with 50 REC. It requires 1.5 Tons of Power Plant to sustain 100 Tons of vessel based on the larger of the Maneuver or Jump Drives, and costs MCr2.5 per Ton of Power Plant.

Power Plants

Hull	P1		P2		P3		P4		P5		P6	
	Tons	Pwr	Tons	Pwr	Tons	Pwr	Tons	Pwr	Tons	Pwr	Tons	Pwr
100	1.5	75	3	150	4.5	225	6	300	7.5	375	9	450
200	3	150	6	300	9	450	12	600	15	750	18	900
400	6	300	12	600	18	900	24	1200	30	1500	36	1800
600	9	450	18	900	27	1350	36	1800	45	2250	54	2700
800	12	600	24	1200	36	1800	48	2400	60	3000	72	3600
1000	15	750	30	1500	45	2250	60	3000	75	3750	90	4500
2000	30	1500	60	3000	90	4500	120	6000	150	7500	180	9000
3000	45	2250	90	4500	135	6750	180	9000	225	11250	270	13500
4000	60	3000	120	6000	180	9000	240	12000	300	15000	360	18000
5000	75	3750	150	7500	225	11250	300	15000	375	18750	450	22500

Hull Tons are for the vessel. The Tons for each Power rating are for the Power Plant; Pwr is the END and REC of the Power Plant. Cost is MCr2.5 per Ton of Power Plant.

If the vessel has a large number of laser weapons or other devices requiring energy, a larger power plant is recommended to maintain power for all systems and weapons.

P2-100 Power Plant: Endurance Reserve (150 END, 150 REC) Reserve: (165 Active Points); OIF Immobile (-1 1/2), Only Powers Electrical Devices (-1/4). Total Cost: 55 points.

The Power Plant table assumes TL 12 Power Plants. At TL 9 and below, the power plant uses twice as much fuel; at TL 13 and above, reduce the fuel consumption by 2% per TL above 12, to a maximum of 10% reduction.

The Main Compartment

The ship’s main compartment contains all non-drive features of the ship, including the bridge, computer, state-rooms, low passage berths, cargo hold, fuel tanks, armament, and other items.

THE BRIDGE

All ships must allocate 2% of their tonnage (minimum 20 DT/40 Hexes) to basic controls, communications equipment, avionics, scanners, detectors, sensors, and other equipment for proper operation of the ship. The cost for this bridge is MCr0.5 per 100 tons of ship.

One or more auxiliary bridges may be installed to replace the prime bridge in the event of battle damage. Costs are identical to those of the prime bridge.

Bridge Systems Table

System	TL	END
Sensors	9	5
Communications	9	5
Flight Control	9	1
Navigation	9	1
Life Support	9	2/100DT
Gravity	9	8
Fire Control	9	1
Defense Control	9	1

SENSORS

Sensors in Traveller do not use a VPP (Variable Power Pool), as the sensor systems are fixed and not reconfigurable at will. Traveller sensor packages are divided into active and passive sets.

Active sensor arrays can have a range of anywhere from 3,000 to 480,000 kilometers and consists of a variety of active and passive sensor emitters, making it a much more sophisticated version of Radar (a combination of Radar, Lidar, and Sonar). The END Cost is 5 END per phase.

Active Sensor Array: (Total: 185 Active Cost, 85 Real Cost) Detect Physical Objects 23-/11- (Unusual Group), Discriminatory, Increased Arc Of Perception (360 Degrees), Range, Sense, Targeting, Tracking (39 Active Points); OIF Bulky (-1), Costs Endurance (-1/2), Sense Affected As More Than One Sense [Radio, Sight, Hearing] (-1/2) (Real Cost: 13) **plus** Analyze with Detect (5 Active Points); OIF Bulky (-1), Costs Endurance (-1/2), Linked (Active Sensor Array; -1/2) (Real Cost: 2) **plus** MegaScale (1" = 100,000 km; +1 1/2), Can Be Scaled Down 1" = 1km (+1/4) for up to 40 Active Points of Active Sensor Array, Reduced Endurance (0 END; +1/2) (105 Active Points); OIF Bulky (-1) (Real Cost: 52) **plus** +12 PER with all Sense Groups (36 Active Points); OIF Bulky (-1) (Real Cost: 18)

Passive sensor arrays use large antennae to detect any electromagnetic emanations from a potential target. These are extremely sophisticated and precise sensors. (High Res Thermal, Densitometers, and Neural Activity Sensors are all passive.)

Cost Power

- 17 **Passive Sensor Array:** Elemental Control, 70-point powers, (35 Active Points); all slots OIF Bulky (-1)

END

- 17 **IR Sensors:** Infrared Perception (Sight Group), Discriminatory, Analyze, Increased Arc Of Perception (360 Degrees), MegaScale (1" = 100,000 km; +1 1/2), Can Be Scaled Down 1" = 1km (+1/4) (55 Active Points); OIF Bulky (-1) 0
- 17 **UV Sensors:** Ultraviolet Perception (Sight Group), Discriminatory, Analyze, Increased Arc Of Perception (360 Degrees), MegaScale (1" = 100,000 km; +1 1/2), Can Be Scaled Down 1" = 1km (+1/4) (55 Active Points); OIF Bulky (-1) 0
- 17 **Optical Telescopic Array:** +10 versus Range Modifier for Sight Group (15 Active Points); OIF Bulky (-1) 0
- 20 **Densitometer:** Detect A Single Thing [Density Of Objects] 21-/9- (Unusual Group), Discriminatory, Analyze, Increased Arc Of Perception (360 Degrees), Range, Sense, Targeting, Tracking, MegaScale (1" = 100,000 km; +1 1/2), Can Be Scaled Down 1" = 1km (+1/4) (110 Active Points); Extra Time (1 Turn (Post-Segment 12), -1 1/4), OIF Bulky (-1), Sense Affected As More Than One Sense [Sight] (-1/2) 0
- 21 **Neutrino Scanner:** Detect A Single Thing [Neutrinos] 21-/9- (Unusual Group), Discriminatory, Analyze, Increased Arc Of Perception (360 Degrees), Range, Rapid: x10, Targeting, Tracking, MegaScale (1" = 100,000 km; +1 1/2), Can Be Scaled Down 1" = 1km (+1/4) (113 Active Points); Extra Time (1 Turn (Post-Segment 12), -1 1/4), OIF Bulky (-1), Sense Affected As More Than One Sense [Sight] (-1/2) 0
- 109 Total Cost**

Probes. Some vessels, especially scientific vessels, carry probes that can be launched to investigate. Each probe costs Cr25,000.

Sensor Probes and Recon Drones: Clairsentience (Sight And Radio Groups), x2 Range (1,540"), 2 Perception Points, Mobile Perception Point (can move up to 6" per Phase), Telescopic: +1, Tracking, Transmit, 4 Continuing Charges lasting 6 Hours each (+3/4), MegaScale (1" = 10,000 km; +1 1/4), Can Be Scaled Down 1" = 1km (+1/4) (171 Active Points); OIF Immobile (-1 1/2), Fixed Perception Point (-1), Sense Affected As More Than One Sense [Sight, Hearing] (-1/2), Concentration (1/2 DCV; -1/4), Probe Must Travel Intervening Space To Target (-1/4). Total Cost: 38 points.

Characters with appropriate skills and materials can add or alter senses available for the probes, such as adding Ultrasonic or Infrared sensors.

COMMUNICATION

Radio and Lightwave communications systems are the only systems available until TL 15; meson communications becomes available at TL15. There are no FTL communication systems of any kind.

Radio Transceiver: Radio Perception/Transmission (Radio Group), MegaScale (1" = 1 million km; +1 3/4), Can Be Scaled Down 1" = 1km (+1/4) (30 Active Points); OIF Immobile (-1 1/2), Crew-Served ([3-4] people; -1/2), Sense Affected As More Than One Sense [very common Sense] (-1/2), Costs Endurance (Only Costs END to Activate; -1/4)

Laser/Maser Comm System: Mind Link , Machine class of minds, Any Willing Target, Any distance, Number of Minds (x128) (55 Active Points); OIF Immobile (-1 1/2), Crew-Served ([3-4] people; -1/2), Sense Affected As

More Than One Sense [very common Sense] (-1/2), Costs Endurance (Only Costs END to Activate; -1/4)

Meson Communicator: *Mind Link, Machine class of minds, Any Willing Target, No LOS Needed, Number of Minds (x32), Difficult To Dispel (x2 Active Points; +1/4), Indirect (Same origin, always fired away from attacker; +1/4) (75 Active Points); OIF Immobility (-1 1/2), Only With Others Who Have Mind Link (-1), Crew-Served ([3-4] people; -1/2), Sense Affected As More Than One Sense [very common Sense] (-1/2), Costs Endurance (Only Costs END to Activate; -1/4)*

FLIGHT CONTROL

The minimum flight control system (piloting system) is the Basic Flight Control station. It costs 1 END of ship's power every phase.

Basic Flight Control: *+2 with Combat Piloting (4 Active Points); OAF Bulky (-1 1/2), Costs Endurance (-1/2). Total Cost: 1 point*

Better flight control systems are available, up to a maximum of +6 with Combat Piloting. Each +1 above the Basic level costs an additional Cr50,000.

NAVIGATION

The minimum navigational system is the Basic Navigation Station. It costs 1 END of ship's power every phase.

Basic Navigation Station: *+2 with Navigation (Air, Hyperspace, Space) (8 Active Points); OAF Bulky (-1 1/2), Costs Endurance (-1/2). Total Cost: 3 points*

LIFE SUPPORT

The ship's life support system provides basic life support (air, temperature, etc.), but maintaining life support takes more energy in larger areas. The END Cost is 2 END for every 200 hexes of ship (100 DT).

Starship Life Support System: *Life Support (Safe in High Radiation; Safe in Intense Cold; Safe in Intense Heat; Safe in Low Pressure/Vacuum; Self-Contained Breathing) (18 Active Points); Costs Endurance (-1/2), Realistic END Cost: END Cost Is Per 200 Hexes (-1/2), Real Equipment (-1/4). Total Cost: 8 points*

The ship's food supply is made up of real food, and so requires storage and replenishment. The example below is food for 16 people for one month.

Food Supplies: *Life Support (Eating: Character does not eat), 16 Continuing Charges lasting 1 Month each (Easily Replaced From Source Outside Of Vehicle; +0) (3 Active Points); OIF Bulky (-1). Total Cost: 1 point*

GRAVITY

Traveller's Gravitics technology allows efficient artificial gravity within vessels. The Artificial Gravity system can maintain normal (1G) gravity, and offset up to 6 G's (6G Maneuver drive acceleration),

Artificial Gravity: *Telekinesis (30 STR), Area Of Effect (One Hex; +1/2), Selective (+1/4) (79 Active Points); OIF*

Bulky (-1), Only To Pull Objects Straight Down To The Floor (-1). Total Cost: 26 points.

FIRE CONTROL

Traveller's fire control systems are typically tied into the main computer. It costs 1 END of ship's power per phase the weapons are armed and ready.

Basic Fire Control: *+2 OCV with Ranged Combat (10 Active Points); OIF Bulky (-1), Costs Endurance (-1/2). Total Cost: 4 points.*

Better fire control systems are available for a higher price, up to a maximum of +6 OCV. Each +1 of additional OCV costs Cr50,000.

DEFENSE CONTROL

Traveller's defense control systems consist of computer-assisted evasive maneuvers, sandcasters, and at TL15 Black Globes become available.

Evasive Program 1: *+2 DCV with Ranged Combat (10 Active Points); OIF Bulky (-1), Costs Endurance (-1/2). Total Cost: 4 points.*

Better defense control systems are available for a higher price, up to a maximum of +6 DCV. Each +1 of additional DCV costs Cr50,000.

COMPUTER

The basic controls do not include the ship's computer, which is installed adjacent to the bridge. The computer is identified by its model number; the computer table indicates price, tonnage, capacity, and tech level available. In general, larger computers are better in combat situations. In addition, the model number indicates the highest level of jump possible for a ship. For example, a ship must have a Model/4 computer before it can perform jump-4, in addition to the jump drive rating installed.

CPU refers to the computer's central processing unit, indicating the capacity to process programs; storage refers to the additional capacity available to hold programs in readiness for processing. Programs themselves are classified by size, using a point indicator to specify how much of the CPU or storage capacity is required for that program to fit into the computer". The number (and exact types) of which are on hand, in storage, or in the CPU is important in the operation of the starship, especially in combat.

There are two bis (meaning second, or improved) models of computer available. Each is treated as the next higher level for jump support, but as the next lower level for software selection. Thus, the Model/1 bis can support jump-2, but has a software package value of only MCr1.

Computers								
Model	MCr	Tons	Capacity	TL	END	INT	DEX	SPD
1	2	1	2/4	5	5	13	12	2
1bis	4	1	4/0	6	5	16	12	2
2	9	2	3/6	7	5	16	14	2
2bis	18	2	6/0	8	5	18	15	2
3	18	3	5/9	9	5	19	16	2
4	30	4	8/15	A	5	22	18	3
5	45	5	12/25	B	5	25	20	4
6	55	7	15/35	C	5	28	22	4
7	80	9	20/50	D	5	31	24	4

Computer cost is indicated in MCr; tonnage required

in tons. TL is the minimum tech level required to produce the equipment. Capacity is used to determine program holding capacity. Model number also indicates the largest jump which the computer can control. END is the energy required from the Power Plant to run the computer.

Computer software (programs) must normally be acquired separately by purchase (or they may be written by a character who has computer expertise). Each computer model as originally furnished includes a basic software package of commonly used programs. This package is selected by the purchaser from the list of available programs; the computer model (1 through 7) indicates the credit value which may be selected. For example, Model/1 allows a package with a value of MCr1, while Model/6 allows a value of MCr6.

Computers

Note: For other examples of Starship computers, see *Terran Empire*, pages 167-168.

MODEL 1

The Model 1 is the bare minimum computer hardware necessary to run a spaceship. It is slow, and can only run 2 programs at a time (so it turns off entertainment and non-essentials during landing, jumps, etc.)

Model 1

Val	Char	Cost	Roll	Notes
13	INT	3	12-	PER Roll 12-
12	DEX	6	11-	OCV 4 DCV 4
2	SPD	0		Phases: 6, 12
Total Characteristic Cost: 9				

Abilities & Equipment

Cost	Power	END
3	<i>Fib Option:</i> Power Defense (10 points) (10 Active Points); OIF Immobile (-1 ½), Custom Modifier (only vs EMP and radiation damage; -1)	
14	Choose 1 Package Option <i>Merchant Skills Package:</i> (Total: 14 Active Cost, 14 Real Cost) +1 with Bureaucratics (Real Cost: 2) plus +1 with Trading (Real Cost: 2) plus KS: Imperial Customs Regulations 12- (Real Cost: 3) plus +2 with KS: Cargo Handling (Real Cost: 2) plus +1 with KS: Cargo Brokering (Real Cost: 1) plus KS: Sector Trade and Financial Data 12- (Real Cost: 3) plus Program: Search Planetary Data Nets For Public Financial Information (Real Cost: 1)	
25	<i>Scout Courier Package:</i> (Total: 25 Active Cost, 25 Real Cost) SS: Astronomy 12- (Real Cost: 3) plus SS: Planetology 12- (Real Cost: 3) plus SS: Basic Planetary Survey 12- (Real Cost: 3) plus KS: Stellar Cartography 14- (Real Cost: 5) plus KS: Planetary Cartography 14- (Real Cost: 5) plus KS: Vessel ID 12- (Real Cost: 3) plus KS: Traffic Analysis 12- (Real Cost: 3)	
15	<i>Survey Scout Package:</i> (Total: 15 Active Cost, 15 Real Cost) SS: Biology 11- (Real Cost: 2) plus SS: Geology 12- (Real Cost: 3) plus SS: Climatology 12- (Real Cost: 3) plus TF: Gig (Real Cost: 1) plus SS: Botany 12- (Real Cost: 3) plus SS: Zoology 11- (Real Cost: 2) plus Program: Gather Data From Remote Sensors, Report Anomalies (Real Cost: 1)	

- 23 *Military Package:* (Total: 23 Active Cost, 23 Real Cost) Tactics 12- (Real Cost: 3) plus Cryptography 12- (Real Cost: 3) plus KS: Traffic Analysis 12- (Real Cost: 3) plus KS: Vessel ID 14- (Real Cost: 5) plus Program: Attack Target (Real Cost: 1) plus Program: Engage in Evasive Action (Real Cost: 1) plus Program: Locate Target (Real Cost: 1) plus Program: Engage Point Defense against incoming targets (Real Cost: 1) plus KS: Imperial Military Customs and Procedures 14- (Real Cost: 5)

Talents

- 3 *Computer:* Absolute Range Sense
3 *Computer:* Absolute Time Sense
3 *Navigational Compass:* Bump Of Direction
5 *Computer:* Eidetic Memory
3 *Computer:* Lightning Calculator
6 *Computer:* Speed Reading (x100)
20 *CLT:* Universal Translator 12-
Program Routines
1 1) Program: Diagnose Ship Malfunctions
1 2) Program: Monitor Internal Monitor Systems, Report Anomalies
1 3) Program: Monitor Communications Systems, Report Anomalies
1 4) Program: Monitor Vehicle Functions, Report Anomalies
1 5) Program: Operate Sensors to scan for designated Phenomenon/Object
1 6) Program: Pilot Ship from Point A to Point B
1 7) Program: Scan and Enter Data
1 8) Program: Schedule Vehicle Events/Use of Resources
1 9) Program: Search Reference Material for Information on a topic
1 10) Program: Send Emergency Call if Operator incapacitated or Killed
1 11) Program: Send Emergency Call if Specific Conditions are not met

Skills

- 12 *Autopilot:* TF: Early Spacecraft, Commercial Spacecraft, Industrial Spacecraft, Military Spacecraft, Mobile Space Stations, Personal Use Spacecraft
6 Systems Operation (Communications Systems, Environmental Systems, Sensors) 12-
3 Security Systems 12-
7 *Ships Administrative Functions:* Bureaucratics 11- +2 with SS: Starship Engineering
Notes: *Database And Diagnostic Software For Specific Ship*
5 AK: Sector Navigation and Planetary Data 14-
5 KS: Sector Library Data 14-
2 *Ships Lasers and Missiles:* WF: Vehicle Weapons, Vehicle Weapons
Notes: *Automated Gunnery Functions*
4 +1 with Navigation (Hyperspace)

Total Abilities & Equipment Cost: 180

Total Vehicle Cost: 189

Value Disadvantages

None

Total Disadvantage Points: 0

Total Cost: 189/5 = 38

MODEL 2

The Model 2 is a somewhat better computer than the Model 1, able to run 3 programs at a time and with a slightly

higher agility.

MODEL 2 STARSHIP COMPUTER

Val	Char	Cost	Roll	Notes
16	INT	6	12-	PER Roll 12-
14	DEX	12	12-	OCV 5 DCV 5
2	SPD	0		Phases: 6, 12
Total Characteristic Cost: 18				

Abilities & Equipment

Cost	Power	END
3	<i>Fib Option:</i> Power Defense (10 points) (10 Active Points); OIF Immobile (-1 ½), Custom Modifier (only vs EMP and radiation damage; -1)	
	Select One Skills Package	
13	<i>Merchant Skills Package:</i> (Total: 13 Active Cost, 13 Real Cost) +1 with Bureaucrats (Real Cost: 2) plus +1 with Trading (Real Cost: 2) plus KS: Imperial Customs Regulations 12- (Real Cost: 3) plus +2 with KS: Cargo Handling (Real Cost: 2) plus +1 with KS: Cargo Brokering (Real Cost: 1) plus KS: Sector Trade and Financial Data 12- (Real Cost: 3)	
25	<i>Scout Courier Package:</i> (Total: 25 Active Cost, 25 Real Cost) SS: Astronomy 12- (Real Cost: 3) plus SS: Planetology 12- (Real Cost: 3) plus SS: Basic Planetary Survey 12- (Real Cost: 3) plus KS: Stellar Cartography 14- (Real Cost: 5) plus KS: Planetary Cartography 14- (Real Cost: 5) plus KS: Vessel ID 12- (Real Cost: 3) plus KS: Traffic Analysis 12- (Real Cost: 3)	
14	<i>Survey Scout Package:</i> (Total: 14 Active Cost, 14 Real Cost) SS: Biology 11- (Real Cost: 2) plus SS: Geology 12- (Real Cost: 3) plus SS: Climatology 12- (Real Cost: 3) plus TF (Real Cost: 1) plus SS: Botany 12- (Real Cost: 3) plus SS: Zoology 11- (Real Cost: 2) Notes: This Is added to the Scout/Courier Package	
19	<i>Military Package :</i> (Total: 19 Active Cost, 19 Real Cost) Tactics 12- (Real Cost: 3) plus Cryptography 12- (Real Cost: 3) plus KS: Traffic Analysis 12- (Real Cost: 3) plus KS: Vessel ID 14- (Real Cost: 5) plus KS: Imperial Military Customs and Procedures 14- (Real Cost: 5)	

Talents

3	Absolute Time Sense
5	Eidetic Memory
3	Lightning Calculator
	Program Routines
3	Absolute Range Sense
3	Bump Of Direction
6	Speed Reading (x100)
20	Universal Translator 12-

Program Routines

1	1) Program: Diagnose Ship Malfunctions
1	2) Program: Monitor Internal Monitor Systems, Report Anomalies
1	3) Program: Monitor Communications Systems, Report Anomalies
1	4) Program: Monitor Vehicle Functions, Report Anomalies
1	5) Program: Operate Sensors to scan for designated Phenomenon/Object
1	6) Program: Pilot Ship from Point A to Point B
1	7) Program: Scan and Enter Data
1	8) Program: Schedule Vehicle Events/Use of Resources
1	9) Program: Search Reference Material for Information on a topic

- 1 10) Program: Send Emergency Call if Operator incapacitated or Killed
- 1 11) Program: Send Emergency Call if Specific Conditions are not met

Skills

- 2 Autopilot: TF: Commercial Spacecraft & Space Yachts, Early Spacecraft, Industrial & Exploratory Spacecraft, Military Spacecraft, Mobile Space Stations, Personal Use Spacecraft, Spaceplanes
- 3 Systems Operation 12-
- 3 Security Systems 12-
- 7 Ships Administrative Functions: Bureaucrats 11-
- 2 +2 with SS: Starship Engineering
- Notes: Database and diagnostic software for specific ship
- 5 AK: Sector Navigation and Planetary Data 14-
- 5 KS: Sector Library Data 14-
- 2 Ships Lasers and Missiles: WF: Vehicle Weapons, Vehicle Weapons. Notes: Automated Gunnery Functions
- 4 +1 with Navigation (Hyperspace)

Total Abilities & Equipment Cost: 161

Total Vehicle Cost: 179

Value Disadvantages
None

Total Disadvantage Points: 0

Total Cost: 179/5 = 36

MODEL 3

The next step in hardware, the Model 3 provides improvements in processing ability and response time, as well as better combat-system control. It can run up to 5 programs simultaneously.

Val	Char	Cost	Roll	Notes
19	INT	9	13-	PER Roll 13-
16	DEX	18	12-	OCV 5 DCV 5
2	SPD	0		Phases: 6, 12
Total Characteristic Cost: 27				

Powers

- 3 **Additional Memory:** +5 INT (5); Only For Running 1 More Program Simultaneously (-1)

The Model 3 has the same software options as the Model 2.

MODEL 4

Model 4 computers have enhanced performance of Model 3 computers, an can run up to 8 programs simultaneously.

Val	Char	Cost	Roll	Notes
22	INT	12	13-	PER Roll 13-
18	DEX	24	13-	OCV 6 DCV 6
3	SPD	2		Phases: 4, 8, 12
Total Characteristic Cost: 38				

Powers

- 10 **Additional Memory:** +20 INT (20); Only For Running 4 More Program Simultaneously (-1)

The Model 4 has the same software options as the Model 2.

MODEL 5

The Model 5 can run 12 programs simultaneously.

Val	Char	Cost	Roll	Notes
25	INT	15	14-	PER Roll 14-
20	DEX	30	13-	OCV 7 DCV 7
4	SPD	10		Phases: 3, 6, 9, 12
Total Characteristic Cost: 55				

Powers

- 17 **Additional Memory:** +35 INT (35); Only For Running 7 More Program Simultaneously (-1)

The Model 5 has the same software options as the Model 2.

MODEL 6

The Model 6 can run 15 programs simultaneously.

Val	Char	Cost	Roll	Notes
28	INT	18	15-	PER Roll 15-
22	DEX	36	13-	OCV 7 DCV 7
4	SPD	10		Phases: 3, 6, 9, 12
Total Characteristic Cost: 64				

Powers

- 25 **Additional Memory:** +50 INT (50); Only For Running 10 More Program Simultaneously (-1)

The Model 6 has the same software options as the Model 2.

MODEL 7

The Model 7 can run 20 programs simultaneously.

Val	Char	Cost	Roll	Notes
31	INT	21	15-	PER Roll 15-
24	DEX	42	14-	OCV 8 DCV 8
4	SPD	6		Phases: 3, 6, 9, 12
Total Characteristic Cost: 69				

Powers

- 35 **Additional Memory:** +70 INT (70); Only For Running 14 More Program Simultaneously (-1)

The Model 7 has the same software options as the Model 2.

MODEL 8

The Model 8 can run 25 programs simultaneously.

Val	Char	Cost	Roll	Notes
34	INT	24	16-	PER Roll 16-
26	DEX	48	14-	OCV 9 DCV 9
4	SPD	4		Phases: 3, 6, 9, 12
Total Characteristic Cost: 76				

Powers

- 45 **Additional Memory:** +90 INT (90); Only For Running 18 More Program Simultaneously (-1)

The Model 5 has the same software options as the Model 2.

MODEL 9

The Model 9 is the first artificially intelligent starship computer. It can run 30 programs simultaneously.

MODEL 9 STARSHIP COMPUTER

Val	Char	Cost	Roll	Notes
18	INT	8	13-	PER Roll 13-
13	EGO	6	12-	ECV: 4
19	DEX	27	13-	OCV 6 DCV 6
4	SPD	11		Phases: 3, 6, 9, 12
Total Characteristic Cost: 52				

Abilities & Equipment

Cost	Power	END
10	<i>Ships Internal Sensors:</i> Clairsentience (Sight And Hearing Groups), +5 to PER Roll (35 Active Points); OIF Immobile (-1 ½), No Range (-½), Only Through The Senses Of Others (-½)	3
3	<i>Fib Option:</i> Power Defense (10 points) (10 Active Points); OIF Immobile (-1 ½), Custom Modifier (only vs EMP and radiation damage; -1)	
65	Additional Memory: +130 INT (130); Only For Running 26 More Program Simultaneously (-1) Select One Skills Package	
13	<i>Merchant Skills Package:</i> (Total: 13 Active Cost, 13 Real Cost) +1 with Bureaucratics (Real Cost: 2) plus +1 with Trading (Real Cost: 2) plus KS: Imperial Customs Regulations 12- (Real Cost: 3) plus +2 with KS: Cargo Handling (Real Cost: 2) plus +1 with KS: Cargo Brokering (Real Cost: 1) plus KS: Sector Trade and Financial Data 12- (Real Cost: 3)	
25	<i>Scout Courier Package:</i> (Total: 25 Active Cost, 25 Real Cost) SS: Astronomy 12- (Real Cost: 3) plus SS: Planetology 12- (Real Cost: 3) plus SS: Basic Planetary Survey 12- (Real Cost: 3) plus KS: Stellar Cartography 14- (Real Cost: 5) plus KS: Planetary Cartography 14- (Real Cost: 5) plus KS: Vessel ID 12- (Real Cost: 3) plus KS: Traffic Analysis 12- (Real Cost: 3)	
14	<i>Survey Scout Package:</i> (Total: 14 Active Cost, 14 Real Cost) SS: Biology 11- (Real Cost: 2) plus SS: Geology 12- (Real Cost: 3) plus SS: Climatology 12- (Real Cost: 3) plus TF (Real Cost: 1) plus SS: Botany 12- (Real Cost: 3) plus SS: Zoology 11- (Real Cost: 2) Notes: This Is added to the Scout/Courier Package	
19	<i>Military Package :</i> (Total: 19 Active Cost, 19 Real Cost) Tactics 12- (Real Cost: 3) plus Cryptography 12- (Real Cost: 3) plus KS: Traffic Analysis 12- (Real Cost: 3) plus KS: Vessel ID 14- (Real Cost: 5) plus KS: Imperial Military Customs and Procedures 14- (Real Cost: 5)	

Talents

3	Absolute Time Sense
5	Eidetic Memory
3	Lightning Calculator
	Program Routines
3	Absolute Range Sense
3	Bump Of Direction
6	Speed Reading (x100)
20	Universal Translator 13-

Program Routines

1	1) Program: Automated Defensive Systems
1	2) Program: Automated Weapons Fire
1	3) Program: Calculate Jump from point A to Point B
1	4) Program: Diagnose Ship Malfunctions
1	5) Program: Monitor Communications Systems, Report Anomalies
1	6) Program: Monitor Internal Monitor Systems, Report Anomalies
1	7) Program: Monitor Ships external sensors

- 1 8) Program: Monitor Vehicle Functions, Report Anomalies
- 1 9) Program: Operate Sensors to scan for designated Phenomenon/Object
- 1 10) Program: Pilot Ship from Point A to Point B
- 1 11) Program: Preprogrammed Evasive Manuevers
- 1 12) Program: Scan and Enter Data
- 1 13) Program: Schedule Vehicle Events/Use of Resources
- 1 14) Program: Search Reference Material for Information on a topic
- 1 15) Program: Send Emergency Call if Operator incapacitated or Killed
- 1 16) Program: Send Emergency Call if Specific Conditions are not met
- 1 17) Program: Ships Information Service

Skills

- 3 Combat Piloting 13-
- 3 Computer Programming 13-
- 3 Navigation (Air, Space) 13-
- 3 Paramedics 13-
- 3 Security Systems 13-
- 1 WF: Vehicle Weapons
- 8 Systems Operation (Communications Systems, Environmental Systems) 15-
- 1 TF: Commercial Spacecraft & Space Yachts, Grav Vehicles/ Hovercraft, Industrial & Exploratory Spacecraft, Personal Use Spacecraft, Spaceplanes
- 3 Tactics 13-

Total Abilities & Equipment Cost: 237

Total Vehicle Cost: 237

Value Disadvantages

None

Total Disadvantage Points: 0

Total Cost: 237/5 = 47

Combat Software and Programs

The following software is available for purchase in the commercial sector, and does not include software available only in the military sector.

Software Name	Effect	MCr
Predict 1	+1 CSL with all Weapons	2
Predict 2	+2 CSL with all Weapons	5
Predict 3	+3 CSL with all Weapons	8
Select 1	+1 PSL to offset Location Mods	0.5
Select 2	+2 PSL to offset Location Mods	0.8
Select 3	+3 PSL to offset Location Mods	1.0
Multi-Target	Rapid Attack: Ranged	3
Maneuver/Evade 1	+1 DCV	1
Maneuver/Evade 2	+2 DCV	2
Maneuver/Evade 3	+3 DCV	3

FIRE CONTROL

Fire control equipment is required if weaponry is to be installed. Each installed turret requires one ton of displacement committed for fire control equipment. Original design plans for ships often include reserve tonnage for later use in installing fire control equipment, or for upgrading computers.

STATEROOMS

Quarters for the crew and passengers are provided in the form of staterooms containing sleeping and living facilities. Each stateroom is sufficient for one person, displaces 4

tons (8 HERO Hexes), and costs Cr500,000. In some starships (especially exploratory vessels, military ships, and privately owned starships), double occupancy is allowed in staterooms. No stateroom can contain more than two persons however, as it would strain the ship's life support equipment. A commercial ship must have one stateroom for each member of the crew.

Stateroom: *Life Support (Sleeping: Character does not sleep) (3 Active Points); OIF Bulky (-1). Total Cost: 1 point*

Quarters do not cost END, but they cost money and do take up space. For the ultimate in closeness, one hex can hold 3 navy-style bunks, but this is not recommended for extended missions.

LOW PASSAGE BERTHS

A Low Berth is a suspended animation tube, providing an inexpensive berth during travel, as the passenger uses little space and resources while in suspended animation. Safely placing a passenger in suspended animation, and removing them from suspended animation, requires *Paramedic* and *Systems Operations: Medical* skills.

Facilities for carrying passengers installed in a ship. One low passage berth carries one low passenger, costs Cr50,000, and displaces one-half ton (one HERO Hex). Low berths also serve well in emergencies, in that they can provide suspended animation facilities for characters when medical care or rescue is not immediately available.

For a *Classic Traveller* feel, the medic must make a *Systems Operations: Medical* skill roll every time he places someone in or takes them out of suspended animation. A failed skill roll sends the passenger into shock, and the medic must succeed with a *Paramedic* roll to revive them from shock and stabilize them. Of course, a failed *Paramedic* skill roll results in death.

Cost: 50,000 Cr

Size: 1 hex

Low Berth (risky version): *Life Support (Longevity: 800 Years) (3 Active Points); OIF Immobile (-1 1/2), Costs Endurance (-1/2), Requires A Paramedic Skill Roll (-1/2), Side Effects (Side Effect only affects the recipient of the benefits of the Power; Target goes into shock, requires Paramedic roll to save; -1/4). Total Cost: 1 point*

For those who expect more reliability of 51st century technology, low berths should be considered relatively safe. The medic should only be required to make a skill roll if the tubes are damaged (space combat), sabotaged, or story-based reasons.

Low Berth: *Life Support (Longevity: 800 Years) (3 Active Points); OIF Immobile (-1 1/2), Costs Endurance (-1/2). Total Cost: 1 point.*

As an option, each TL of the Low Berth above 9 gives the medic a +1 modifier to his skill roll, representing greater reliability of the low berth unit.

Emergency low berths are also available; they will not carry passengers, but can be used for emergency survival. Each costs Cr100,000 and displaces one ton (2 HERO Hexes). Each holds four persons who share the same revival die roll,

FUEL

Total fuel tankage for a ship must be indicated in the design plans. There is no cost, but the capacity does influ-

ence how often the ship must refuel. At a minimum, ship fuel tankage must equal $0.1M\text{Jn} + 10\text{Pn}$, where M is the tonnage of the ship, Jn is the ship's jump number, and Pn is the ship's power plant rating. Power plant fuel under the formula (10Pn) allows routine operations and maneuver for four weeks. Jump fuel under the formula ($0.1M\text{Jn}$) allows one jump of the stated level. Ships performing jumps less than their maximum capacity consume fuel at a lower level based on the jump number used.

FUEL SCOOPS

Refined fuel can be purchased at most starports at a cost of 500 Cr per DT (or 100 Cr per DT for unrefined fuel). However this is not always practical, especially when traveling to areas lacking starports.

Ships fitted with fuel scoops can scoop hydrogen for fuel from gas giants or oceans on worlds having oceans. However this fuel is unrefined, and dramatically increases the chance of a misjump unless refined. Ships with fuel scoops should also install a Fuel Purification Plant.

FUEL PURIFICATION PLANT

Fuel purification plants can purify 1000 DT of fuel per 6 hours. Ships with very large fuel tanks often have several purification plants installed. The size and cost of fuel purification plants varies by Tech Level.

Fuel Purification Plant		
TL	DT	Cost (kCr)
8	50	200
9	45	190
10	40	180
11	35	170
12	30	160
13	25	150
14	20	140
15	15	150

Fuel Purification Plant: *Minor Transform 4d6 (Liquid Hydrogen or Water to usable fuel) (40 Active Points); Extra Time (6 Hours, -3 1/2), OIF Immobile (-1 1/2), Custom Modifier (Real Equipment; -1/4). Total Cost: 7 points*

CARGO HOLD

The design plan must indicate cargo capacity. There is no cost, but cargo carried may not exceed cargo capacity.

SHIP'S LOCKER

Every ship has a ship's locker. The actual cost of much of the equipment within the locker is inconsequential when compared to hull and drive costs; the GM should administer what is actually within the ship's locker based on the situation. Typical equipment carried aboard will include protective clothing, vacc suits, weapons such as shotguns or carbines, pistols, ammunition, compasses and survival aids, and portable shelters.

Note: The GM may decide to assign **Resource Points** to the ship's locker (see *Dark Champions*), and have the players allocate those points at the beginning of the scenario or at starbases as appropriate.

ARMAMENTS

Any ship may have one *hardpoint* per 100 tons of ship. Designation of a hardpoint requires no tonnage, and costs Cr100,000. Hardpoints may be left unused if desired.

SHIP CREWS

Each ship requires a crew. On small ships, the crew may be one person; on larger ships, the crew can be quite large. The following basic crew positions must be filled:

Pilot: Each starship and non-starship requires a pilot, who must have at least *Combat Pilot* skill, and *Transport Familiarity* with the appropriate class of vessel. Small craft require a pilot who must have at least *Transport Familiarity (Ship's Boat)*. Cr6,000 monthly salary.

Navigator: Each starship displacing greater than 200 tons must have a navigator, who must have *Navigation (Space)* for non-jump vessels, and *Navigation (Hyperspace)* for Jump-capable vessels. The pilot of a small craft or non-starship can handle its navigation requirements. Cr5,000 monthly.

Engineer: Any ship with tonnage of 200 tons or more must have one engineer (with at least *SS: Starship Engineering, Mechanics, and Electronics* skills) per 35 tons of drives and power plant. If there is more than one engineer, then the most skilled (or the oldest) becomes chief engineer with 10% more pay. Ships under 200 tons and small craft do not require an engineer, although engineering skill may prove useful. Cr4,000 monthly salary.

Steward: If high passengers are carried, then a steward is required. There must be at least one steward (*PS: Steward 8-* or better) per eight high passengers on the ship. If there is more than one steward, the most skilled is designated chief steward (or purser) and draws 10% more salary. Cr3,000 monthly salary.

Medic: Each starship of 200 tons or more must have a medic (at least *Paramedic* skill and *SS: Medicine 8-*). In addition, there must be at least one medic per 120 passengers carried. If there is more than one medic, the most skilled is designated ship's doctor and draws 10% more pay. Non-starships and small craft do not require medics. Cr2,000 monthly salary.

Gunner: One gunner (*Weapon Familiarity (Starship Weapons)* or *System Operations (Missiles)* or better required) may be hired per turret on a ship. Armed small craft require a gunner in addition to the pilot. If there is more than one gunner, the most skilled is designated the chief gunner and draws 10% more pay. The gunner position may be omitted if there is no major threat to the ship. Cr1,000 monthly salary.

One person may fill two crew positions, providing he or she has the skills needed for both jobs and has at least +1 with each skill for those positions. The individual draws total salary equal to 75% of each position. No person may assume the duties of more than two crew positions except in the case of an emergency.

Other crew positions may be created depending on the facilities of the starship: for example, a starship which carries a cutter could have a crew position for cutter pilot (and possibly for cutter gunner) in addition to its normal crew positions. Specific jobs or tasks (laboratory technician if the ship has a laboratory; contact specialist if the ship is assigned alien contact missions) require crew members to perform them.

For starships of greater than 1000 tons hull mass displacement, the crew should also include a commanding officer (or captain), his executive officer, and at least three

administrative personnel. Extremely large starships should have at least 10 crew members for each 1000 tons of mass displacement.

Optional Components

The following are optional components. Where not present, they may be added to a standard design by the purchaser.

ATMOSPHERIC STREAMLINING

The hulls specified are rough deep space configurations incapable of entering atmospheres. They may be streamlined by so indicating in the design plans, at a cost of MCr1 per 100 tons of ship. This streamlining includes fuel scoops which allow the skimming of unrefined fuel from gas giants and the gathering of water from open lakes or oceans. Streamlining may not be retrofitted; it must be included at the time of construction.

WEAPONRY

Starship lasers are the most common starship weapon in the Traveller universe. Although lasers first appear at TL7, they become usable as starship weapons at TL9.

Lasers are available in two styles: beam and pulse. Beam lasers fire a beam of energy, typically lasting about one second. Pulse lasers fire a pulse of energy, which is more like an energy bullet than beam. Pulse lasers do slightly more damage than beam lasers, but are less accurate because of the shorter pulse of energy.

Either laser can fire at short or long-distance targets. The maximum range is capped at about 600,000 kilometers, but any target beyond 300,000 kilometers must account for light-speed lag (see *Star Hero*, page 217).

Starship lasers can be mounted in turrets, which include single, double and triple turrets, as well as pop-up turrets and barbette.

On warships, lasers are also configured as spinal weapons, bays, etc.

Lasers come in 3 power levels: Low Tech (TL9), Medium Tech (TL12, Imperial Standard), and High Tech (TL15). Low Tech lasers are visible light lasers, and use a lot of energy. Medium Tech lasers are UV lasers, and are not wasteful of energy. High Tech lasers are high-spectrum lasers, invisible as are UV, and have a much greater penetration rate through armor (Armor-Piercing).

The four commonly available weapons types are pulse lasers, beam lasers, missile launchers, and sandcasters.

Pulse Lasers fire short bursts of energy at targets and are more effective at inflicting damage than are beam lasers.

Pulse Lasers						
Weapon	TL	Dmg	OCV	RMod	END	MCr
Laser, Single Turret	9	8d6+1	+0	+0	24	0.7
Laser, Double Turret	9	8d6+1	+0	+0	30@	1.5
Laser, Triple Turret	9	8d6+1	+0	+0	30@	2.5
Laser, Single Turret	12	9d6	+0	+0	17	0.7
Laser, Double Turret	12	9d6	+0	+0	20@	1.5
Laser, Triple Turret	12	9d6	+0	+0	20@	2.5
Laser, Single Turret	15	9d6+1AP	+0	+0	12	0.7
Laser, Double Turret	15	9d6+1AP	+0	+0	14@	1.5
Laser, Triple Turret	15	9d6+1AP	+0	+0	14@	2.5

PULSE LASER, 250 MW SINGLE-TURRET

Effect: RKA 8d6+1
END: 24
Range: 600,000 kilometers
Description: This is the standard TL9 pulse laser in a single turret.

Cost	Powers	END
271	<i>TL9 Pulse Laser:</i> (Total: 641 Active Cost, 271 Real Cost) RKA 8d6+1 (125 Active Points); OIF Bulky (-1), Increased Endurance Cost (x2 END; -1/2), Beam (-1/4), Real Weapon (-1/4) (Real Cost: 42) plus Variable Advantage (+1 1/2 Advantages; Limited Group of Advantages; MegaScale or Increased Maximum Range plus Reduced Range Mod only; +2 3/4) for up to 125 Active Points of Laser, Reduced Endurance (0 END; +1/2) (516 Active Points); OIF Bulky (-1), Limited Power Range and Damage affected by media (-1/4) (Real Cost: 229)	24

PULSE LASER, 250 MW TRIPLE TURRET

Effect: RKA 8d6+1, 3-shot autofire
END: 32 per shot
Range: 600,000 kilometers
Description: This is the standard TL9 pulse laser in a triple turret. The Active and Real Costs are the same for the Double and Triple Turret versions.

Cost	Powers	END
338	<i>TL9 Triple Turret Pulse Laser:</i> (Total: 799 Active Cost, 338 Real Cost) RKA 8d6+1, Autofire (3 shots; +1/4) (156 Active Points); OIF Bulky (-1), Increased Endurance Cost (x2 END; -1/2), Beam (-1/4), Real Weapon (-1/4) (Real Cost: 52) plus Variable Advantage (+1 1/2 Advantages; Limited Group of Advantages; MegaScale or Increased Maximum Range plus Reduced Range Mod only; +2 3/4) for up to 156 Active Points of Laser, Reduced Endurance (0 END; +1/2) (643 Active Points); OIF Bulky (-1), Limited Power Range and Damage affected by media (-1/4) (Real Cost: 286)	32

PULSE LASER, 250 MW TL12 SINGLE-TURRET

Effect: RKA 9d6, Invisible to Normal Sight
END: 17
Range: 600,000 kilometers
Description: This is the standard TL12 turreted pulse laser in a single turret.

Cost	Powers	END
378	<i>TL12 Pulse Laser:</i> (Total: 866 Active Cost, 378 Real Cost) RKA 9d6, Invisible to Single Sense (Normal Sight; +1/4) (169 Active Points); OIF Bulky (-1), Beam (-1/4), Real Weapon (-1/4) (Real Cost: 68) plus Variable Advantage (+1 1/2 Advantages; Limited Group of Advantages; MegaScale or Increased Maximum Range plus Reduced Range Mod only; +2 3/4) for up to 169 Active Points of Laser, Reduced Endurance (0 END; +1/2) (697 Active Points); OIF Bulky (-1), Limited Power Range and Damage affected by media (-1/4) (Real Cost: 310)	17

PULSE LASER, 250 MW TL12 TRIPLE-TURRET

Effect: RKA 9d6, Invisible to Normal Sight, AF (3)
END: 20 per shot
Range: 600,000 kilometers

Description: This is the standard TL12 turreted pulse laser in a triple turret. The Real and Active Costs are the same for a double turret.

Cost	Powers	END
451	TL12 Triple Turret Beam Laser: (Total: 1034 Active Cost, 451 Real Cost) RKA 9d6, Autofire (3 shots; +1/4), Invisible to Single Sense (+1/4) (202 Active Points); OIF Bulky (-1), Beam (-1/4), Real Weapon (-1/4) (Real Cost: 81) plus Variable Advantage (+1 1/2 Advantages; Limited Group of Advantages; MegaScale or Increased Maximum Range plus Reduced Range Mod only; +2 3/4) for up to 202 Active Points of Laser, Reduced Endurance (0 END; +1/2) (832 Active Points); OIF Bulky (-1), Limited Power Range and Damage affected by media (-1/4) (Real Cost: 370)	20

PULSE LASER, 250 MW TL15 SINGLE-TURRET

Effect: RKA 9d6+1, Invisibility to Normal Sight, AP
END: 12

Range: 600,000 kilometers

Description: This is the standard TL15 laser in a single turret.

Cost	Powers	END
625	TL15 Pulse Laser: (Total: 1435 Active Cost, 625 Real Cost) RKA 9d6+1, Invisible to Single Sense (Normal Sight; +1/4), Reduced Endurance (1/2 END; +1/4), Armor Piercing (+1/2) (280 Active Points); OIF Bulky (-1), Beam (-1/4), Real Weapon (-1/4) (Real Cost: 112) plus Variable Advantage (+1 1/2 Advantages; Limited Group of Advantages; MegaScale or Increased Maximum Range plus Reduced Range Mod only; +2 3/4) for up to 280 Active Points of Laser, Reduced Endurance (0 END; +1/2) (1155 Active Points); OIF Bulky (-1), Limited Power Range and Damage affected by media (-1/4) (Real Cost: 513)	12

PULSE LASER, 250 MW TL15 TRIPLE-TURRET

Effect: RKA 9d6+1, Invis. to Normal Sight, AP

END: 14 per shot

Range: 600,000 kilometers

Description: This is the standard TL15 laser in a triple turret; Active and Real Costs are same for double.

Cost	Powers	END
781	TL15 Triple Turret Pulse Laser: (Total: 1793 Active Cost, 781 Real Cost) RKA 9d6+1, Invisible to Single Sense (Normal Sight; +1/4), Autofire (3 shots; +1/4), Armor Piercing (+1/2), Reduced Endurance (1/2 END; +1/2) (350 Active Points); OIF Bulky (-1), Beam (-1/4), Real Weapon (-1/4) (Real Cost: 140) plus Variable Advantage (+1 1/2 Advantages; Limited Group of Advantages; MegaScale or Increased Maximum Range plus Reduced Range Mod only; +2 3/4) for up to 350 Active Points of Laser, Reduced Endurance (0 END; +1/2) (1443 Active Points); OIF Bulky (-1), Limited Power Range and Damage affected by media (-1/4) (Real Cost: 641)	14

Beam Lasers fire continuous beams of energy and are more effective in achieving hits than are pulse lasers.

Beam Lasers						
Weapon	TL	Dmg	OCV	RMod	END	MCr
Laser, Single Turret	9	8d6	+2	+0	25	1.2
Laser, Double Turret	9	8d6	+2	+0	31@	2.5
Laser, Triple Turret	9	8d6	+2	+0	31@	4.0
Laser, Single Turret	12	8½d6	+2	+0	17	1.2
Laser, Double Turret	12	8½d6	+2	+0	20@	2.5
Laser, Triple Turret	12	8½d6	+2	+0	20@	4.0
Laser, Single Turret	15	9d6AP	+2	+0	13	1.2
Laser, Double Turret	15	9d6AP	+2	+0	14@	2.5
Laser, Triple Turret	15	9d6AP	+2	+0	14@	4.0

BEAM LASER, 250 MW SINGLE-TURRET

Effect: RKA 8d6

END: 25

Range: 600,000 kilometers

Description: This is the standard TL9 laser in a single turret.

Cost	Powers	END
264	TL9 Beam Laser: (Total: 625 Active Cost, 264 Real Cost) RKA 8d6 (120 Active Points); OIF Bulky (-1), Increased Endurance Cost (x2 END; -1/2), Beam (-1/4), Real Weapon (-1/4) (Real Cost: 40) plus Variable Advantage (+1 1/2 Advantages; Limited Group of Advantages; MegaScale or Increased Maximum Range plus Reduced Range Mod only; +2 3/4) for up to 120 Active Points of Laser, Reduced Endurance (0 END; +1/2) (495 Active Points); OIF Bulky (-1), Limited Power Range and Damage affected by media (-1/4) (Real Cost: 220) plus +2 with Ranged Combat (10 Active Points); OIF Bulky (-1), Costs Endurance (-1/2), Real Weapon (-1/4) (Real Cost: 4)	25

BEAM LASER, 250 MW TRIPLE TURRET

Effect: RKA 8d6, 3-shot autofire

END: 31 per shot

Range: 600,000 kilometers

Description: This is the standard TL9 laser in a triple turret. The Active and Real Costs are the same for the Double and Triple Turret versions.

Cost	Powers	END
329	TL9 Triple Turret Beam Laser: (Total: 778 Active Cost, 329 Real Cost) RKA 8d6, Autofire (3 shots; +1/4) (150 Active Points); OIF Bulky (-1), Increased Endurance Cost (x2 END; -1/2), Beam (-1/4), Real Weapon (-1/4) (Real Cost: 50) plus Variable Advantage (+1 1/2 Advantages; Limited Group of Advantages; MegaScale or Increased Maximum Range plus Reduced Range Mod only; +2 3/4) for up to 150 Active Points of Laser, Reduced Endurance (0 END; +1/2) (618 Active Points); OIF Bulky (-1), Limited Power Range and Damage affected by media (-1/4) (Real Cost: 275) plus +2 with Ranged Combat (10 Active Points); OIF Bulky (-1), Costs Endurance (-1/2), Real Weapon (-1/4) (Real Cost: 4)	31

BEAM LASER, 250 MW TL12 SINGLE-TURRET

Effect: RKA 8 1/2d6, Invisible to Normal Sight

END: 17

Range: 600,000 kilometers

Description: This is the standard TL12 turreted laser in a single turret.

Cost	Powers	END
365	<i>TL12 Beam Laser:</i> (Total: 839 Active Cost, 365 Real Cost) RKA 8 1/2d6, Invisible to Single Sense (Normal Sight; +1/4) (162 Active Points); OIF Bulky (-1), Beam (-1/4), Real Weapon (-1/4) (Real Cost: 65) plus Variable Advantage (+1 1/2 Advantages; Limited Group of Advantages; MegaScale or Increased Maximum Range plus Reduced Range Mod only; +2 3/4) for up to 162 Active Points of Laser, Reduced Endurance (0 END; +1/2) (667 Active Points); OIF Bulky (-1), Limited Power Range and Damage affected by media (-1/4) (Real Cost: 296) plus +2 with Ranged Combat (10 Active Points); OIF Bulky (-1), Costs Endurance (-1/2), Real Weapon (-1/4) (Real Cost: 4)	17

BEAM LASER, 250 MW TL12 TRIPLE-TURRET

Effect: RKA 8 1/2d6, Invisible to Normal Sight, AF (3)

END: 20 per shot

Range: 600,000 kilometers

Description: This is the standard TL12 turreted laser in a triple turret. The Real and Active Costs are the same for a double turret.

Cost	Powers	END
439	<i>TL12 Triple Turret Beam Laser:</i> (Total: 1009 Active Cost, 439 Real Cost) RKA 8 1/2d6, Autofire (3 shots; +1/4), Invisible to Single Sense (+1/4) (195 Active Points); OIF Bulky (-1), Beam (-1/4), Real Weapon (-1/4) (Real Cost: 78) plus Variable Advantage (+1 1/2 Advantages; Limited Group of Advantages; MegaScale or Increased Maximum Range plus Reduced Range Mod only; +2 3/4) for up to 195 Active Points of Laser, Reduced Endurance (0 END; +1/2) (804 Active Points); OIF Bulky (-1), Limited Power Range and Damage affected by media (-1/4) (Real Cost: 357) plus +2 with Ranged Combat (10 Active Points); OIF Bulky (-1), Costs Endurance (-1/2), Real Weapon (-1/4) (Real Cost: 4)	20

BEAM LASER, 250 MW TL15 SINGLE-TURRET

Effect: RKA 9d6, Invisibility to Normal Sight, AP

END: 13

Range: 600,000 kilometers

Description: This is the standard TL15 laser in a single turret.

Cost	Powers	END
607	<i>TL15 Beam Laser:</i> (Total: 1393 Active Cost, 607 Real Cost) RKA 9d6, Invisible to Single Sense (Normal Sight; +1/4), Reduced Endurance (1/2 END; +1/4), Armor Piercing (+1/2) (270 Active Points); OIF Bulky (-1), Beam (-1/4), Real Weapon (-1/4) (Real Cost: 108) plus Variable Advantage (+1 1/2 Advantages; Limited Group of Advantages; MegaScale or Increased Maximum Range plus Reduced Range Mod only; +2 3/4) for up to 270 Active Points of Laser, Reduced Endurance (0 END; +1/2) (1113 Active Points); OIF Bulky (-1), Limited Power Range and Damage affected by media (-1/4) (Real Cost: 495) plus +2 with Ranged Combat (10 Active Points); OIF Bulky (-1), Costs Endurance (-1/2), Real Weapon (-1/4) (Real Cost: 4)	13

BEAM LASER, 250 MW TL15 TRIPLE-TURRET

Effect: RKA 9d6, Invis. to Normal Sight, AP

END: 14 per shot

Range: 600,000 kilometers

Description: This is the standard TL15 laser in a triple turret; Active and Real Costs are same for double.

Cost	Powers	END
757	<i>TL15 Triple Turret Beam Laser:</i> (Total: 1737 Active Cost, 757 Real Cost) RKA 9d6, Invisible to Single Sense (Normal Sight; +1/4), Autofire (3 shots; +1/4), Armor Piercing (+1/2), Reduced Endurance (1/2 END; +1/2) (337 Active Points); OIF Bulky (-1), Beam (-1/4), Real Weapon (-1/4) (Real Cost: 135) plus Variable Advantage (+1 1/2 Advantages; Limited Group of Advantages; MegaScale or Increased Maximum Range plus Reduced Range Mod only; +2 3/4) for up to 337 Active Points of Laser, Reduced Endurance (0 END; +1/2) (1390 Active Points); OIF Bulky (-1), Limited Power Range and Damage affected by media (-1/4) (Real Cost: 618) plus +2 with Ranged Combat (10 Active Points); OIF Bulky (-1), Costs Endurance (-1/2), Real Weapon (-1/4) (Real Cost: 4)	14

Laser Options

1200 MW TL15 HEAVY LASER SINGLE-TURRET

Effect: RKA 10d6, Armor-Piercing, Invisibility to Normal Sight

END: 14

Range: 375,000 kilometers

Description: This is a 1200 megawatt laser barbette.

Cost	Powers	END
62	<i>TL15 Heavy Beam Laser:</i> (Total: 1547 Active Cost, 674 Real Cost) RKA 10d6, Invisible to Single Sense (UV; +1/4), Reduced Endurance (1/2 END; +1/4), Armor Piercing (+1/2) (300 Active Points); OIF Bulky (-1), Beam (-1/4), Real Weapon (-1/4) (Real Cost: 120) plus Variable Advantage (+1 1/2 Advantages; Limited Group of Advantages; MegaScale or Increased Maximum Range plus Reduced Range Mod only; +2 3/4) for up to 300 Active Points of Laser, Reduced Endurance (0 END; +1/2) (1237 Active Points); OIF Bulky (-1), Limited Power Range and Damage affected by media (-1/4) (Real Cost: 550) plus +2 with Ranged Combat (10 Active Points); OIF Bulky (-1), Costs Endurance (-1/2), Real Weapon (-1/4) (Real Cost: 4)	14

Turret Options

POPUPTURRET

Popup turret are completely undetectable by visuals and sensors until the weapons they contain are powered up for use, at which time the turret pops up and becomes visible.

Cost	Powers	END
33	<i>Popup Turret:</i> Invisibility to Sight, Hearing and Radio Groups and Detect, Reduced Endurance (0 END; +1/2) (49 Active Points); Limited Power Weapon and Turrent Undetectable Until Powered Up For Use (-1/2)	0

LASER BARBETTE

A laser barbette is an specially-built unmanned laser turret, using fire-control software rather than a live gunner.

BAY LASER

Bay Lasers have are *Crew-Served* (2 people; -1/4) and have *Limited Arc Of Fire* (60 degrees; Only on same horizontal level; -3/4). This usually allows for more powerful lasers.
Effect: RKA 10d6, Armor-Piercing, Inv. to Normal Sight
END: 14

Range: 375,000 kilometers

Description: This is a high-power laser bay.

Cost	Powers	END
640	<i>TL15 Sniper Bay Laser:</i> (Total: 1547 Active Cost, 640 Real Cost) RKA 10d6, Invisible to Single Sense (Normal Sight; +1/4), Reduced Endurance (1/2 END; +1/4), Armor Piercing (+1/2) (300 Active Points); OIF Bulky (-1), Limited Arc Of Fire (60 degrees; Only on same horizontal level; -3/4), Beam (-1/4), Real Weapon (-1/4), Crew-Served (2 people; -1/4) (Real Cost: 86) plus Variable Advantage (+1 1/2 Advantages; Limited Group of Advantages; MegaScale or Increased Maximum Range plus Reduced Range Mod only; +2 3/4) for up to 300 Active Points of Laser, Reduced Endurance (0 END; +1/2) (1237 Active Points); OIF Bulky (-1), Limited Power Range and Damage affected by media (-1/4) (Real Cost: 550) plus +2 with Ranged Combat (10 Active Points); OIF Bulky (-1), Costs Endurance (-1/2), Real Weapon (-1/4) (Real Cost: 4)	14

SPINAL MOUNT LASER

Spinal Mount lasers can only be fired in the direction the ship is traveling. The tradeoff is limited direction for greater damage.

Effect: RKA 12d6, Armor-Piercing

END: 16

Range: 375,000 kilometers

Description: This is a high-power Spinal Mount laser.

Cost	Powers	End
749	<i>TL15 Spinal Mount Laser:</i> (Total: 1855 Active Cost, 749 Real Cost) RKA 12d6, Invisible to Single Sense (Normal Sight; +1/4), Reduced Endurance (1/2 END; +1/4), Armor Piercing (+1/2) (360 Active Points); OIF Bulky (-1), Crew-Served ([9-16] people; -1), Limited Arc Of Fire (One hex row; Direction ship is facing; -3/4), Beam (-1/4), Real Weapon (-1/4) (Real Cost: 85) plus Variable Advantage (+1 1/2 Advantages; Limited Group of Advantages; MegaScale or Increased Maximum Range plus Reduced Range Mod only; +2 3/4) for up to 360 Active Points of Laser, Reduced Endurance (0 END; +1/2) (1485 Active Points); OIF Bulky (-1), Limited Power Range and Damage affected by media (-1/4) (Real Cost: 660) plus +2 with Ranged Combat (10 Active Points); OIF Bulky (-1), Costs Endurance (-1/2), Real Weapon (-1/4) (Real Cost: 4)	16

Missile Racks are launchers for small anti-ship missiles. The typical missile is a homing type which constantly seeks the target ship, ultimately being destroyed by the target's defenses, or exploding and doing damage to it. Such missiles may also be converted to planetary surface bombs, or to surveillance drones (mechanical and electronic skill should apply in such cases). Individual missiles weigh about 50 kg, and cost Cr5.000 each; one rack holds 12 missiles.

Missile Racks

Weapon	TL	Dmg	OCV	RMod	END	MCR
Missile, Single Turret	9	6½d6X	+10	+0	[12c]	0.95
Missile, Double Turret	9	6½d6X	+10	+0	[24c]	1.5
Missile, Triple Turret	9	6½d6X	+10	+0	[36c]	3.25
Missile, Single Turret	12	6½d6X	+10	+0	[12c]	0.95
Missile, Double Turret	12	6½d6X	+10	+0	[24c]	1.5
Missile, Triple Turret	12	6½d6X	+10	+0	[36c]	3.25
Missile, Single Turret	15	6½d6X	+10	+0	[12c]	0.95
Missile, Double Turret	15	6½d6X	+10	+0	[24c]	1.5
Missile, Triple Turret	15	6½d6X	+10	+0	[36c]	3.25

Sandcasters are defensive weapons; they dispense small particles which counteract the strength of lasers and protect the ship. The specific particles used are similar to the material used in ablat personal armor; replacement canisters of this special sand weigh about 50 kg and cost Cr400.

Sandcaster

Weapon	TL	Effect	Duration	END	MCR
Sandcaster	9	50% Dmg Reduction	5 minutes	[12cc]	0.45
Sandcaster	12	50% Dmg Reduction	5 minutes	[12cc]	0.45
Sandcaster	15	50% Dmg Reduction	5 minutes	[12cc]	0.45

Sandcaster: *Energy Damage Reduction, Resistant, 50%, 12 Continuing Charges lasting 5 Minutes each (+0) (30 Active Points); OIF Bulky (-1). Total Cost: 15 points*

Mounts: One turret may be attached to each hardpoint on the ship. When it is attached, one ton (two Hexes) for fire control must be allocated. Turrets themselves are available in single, double, and triple mounts which will hold one, two, or three weapons respectively.

Turrets and weapons may be altered or retrofitted. For example, a single turret can have its pulse laser replaced by a beam laser when it becomes available; a single turret can be replaced by a triple turret when it becomes available.

Point Defense Laser Array

Point Defense Lasers are not as powerful as the standard laser, but they are extremely accurate, since their main job is destroying incoming missiles.

POINT DEFENSE LASER ARRAY

Effect: RKA 5d6, AF (10 shots), +10 OCV, Missile Deflection

END: 17/shot

Range: 375,000 kilometers

Description: This is point defense laser array.

Cost	Powers	END
92	<i>Quadpulse Point Defense Laser Array:</i> (Total: 199 Active Cost, 92 Real Cost) RKA 5d6, MegaScale (1" = 1 km; +1/4), Autofire (10 shots; +1) (169 Active Points); OIF Bulky (-1), Real Weapon (-1/4) (Real Cost: 75) plus +10 with any single attack with one specific weapon (Real Cost: 10) plus Missile Deflection (Any Ranged Attack) (20 Active Points); OIF Bulky (-1), Linked (RKA; -1/2), Real Armor (-1/4) (Real Cost: 7)	17

Meson Guns

Meson Guns fire subatomic particles known as mesons, a characteristic which allows them to penetrate armor but not energy shields.

Meson Bay Weapons

50-TON MESON GUN BAY

Effect: RKA 8 1/2d6, AVL D (Energy Screens)

END: 124

Range: 375,000 kilometers

Description: This is a 50-ton meson gun bay.

Cost	Powers	END
169	50 Ton Meson Gun Bay: (Total: 638 Active Cost, 169 Real Cost) RKA 8 1/2d6, Area Of Effect (182" Line; +1), MegaScale (1" = 100 km; +3/4), Can Be Scaled Down 1" = 1km (+1/4), AVL D (Screens or Force Fields; +1 1/2) (585 Active Points); OIF Bulky (-1), Increased Endurance Cost (x2 END; -1/2), Custom Modifier (Cannot be used in atmospheres; -1/2), Custom Modifier (60 degree firing arc on same level; -1/2), Crew-Served (2 people; -1/4), Real Weapon (-1/4) (Real Cost: 146) plus Suppress 4d6, MegaScale (1" = 100 km; +3/4), Can Be Scaled Down 1" = 1km (+1/4) (40 Active Points); OIF Bulky (-1), Linked (Meson Beam; -1/2), Increased Endurance Cost (x2 END; -1/2), Custom Modifier (60 degree firing arc on same level; -1/2), Crew-Served (2 people; -1/4), Real Weapon (-1/4) (Real Cost: 10) plus +4 with any single attack with one specific weapon (Real Cost: 4) plus Penalty Skill Levels: +6 vs. Range Modifier with a single attack (Real Cost: 9)	124

100-TON MESON GUN BAY

Effect: RKA 10 1/2d6, AVL D (Energy Screens)

END: 154

Range: 375,000 kilometers

Description: This is a 100-ton Meson Gun Bay.

Cost	Powers	END
205	100 Ton Meson Gun Bay: (Total: 783 Active Cost, 205 Real Cost) RKA 10 1/2d6, Area Of Effect (224" Line; +1), MegaScale (1" = 100 km; +3/4), Can Be Scaled Down 1" = 1km (+1/4), AVL D (Screens or Force Fields; +1 1/2) (720 Active Points); OIF Bulky (-1), Increased Endurance Cost (x2 END; -1/2), Custom Modifier (Cannot be used in atmospheres; -1/2), Custom Modifier (60 degree firing arc on same level; -1/2), Crew-Served (2 people; -1/4), Real Weapon (-1/4) (Real Cost: 180) plus Suppress 5d6, MegaScale (1" = 100 km; +3/4), Can Be Scaled Down 1" = 1km (+1/4) (50 Active Points); OIF Bulky (-1), Linked (Meson Beam; -1/2), Increased Endurance Cost (x2 END; -1/2), Custom Modifier (60 degree firing arc on same level; -1/2), Crew-Served (2 people; -1/4), Real Weapon (-1/4) (Real Cost: 12) plus +4 with any single attack with one specific weapon (Real Cost: 4) plus Penalty Skill Levels: +6 vs. Range Modifier with a single attack (Real Cost: 9)	154

Spinal Meson Guns

LIGHT SPINAL MESON GUN

Effect: RKA 13d6, NND (Does BODY) plus 5d6 Suppress Electronics

END: 144

Range: 30 million kilometers

Description: Light Spinal Meson Gun.

Cost	Powers	END
148	Light Spinal Meson Gun: (Total: 728 Active Cost, 148 Real Cost) RKA 13d6, NND ([Standard]; Meson Screens or Black Globes; +1), MegaScale (1" = 10,000 km; +1 1/4) (634 Active Points); OIF Immobile (-1 1/2), Crew-Served ([17-32] people; -1 1/4), Limited Arc Of Fire (Only on same horizontal level; -1), Extra Time (1 Turn (Post-Segment 12), Only to Activate, -3/4), Increased Endurance Cost (x2 END; -1/2), Beam (-1/4) (Real Cost: 101) plus Suppress 5d6, Variable Special Effects (Any SFX; All Unshielded Electronics; +1/2), NND ([Standard]; Meson Screens or Black Globes; +1), MegaScale (1" = 10,000 km; +1 1/4) (94 Active Points); Custom Modifier (Linked to Spinal Meson Gun; -1/2), Increased Endurance Cost (x2 END; -1/2) (Real Cost: 47)	144

MEDIUM SPINAL MESON GUN

Effect: RKA 15d6, NND (Does BODY) plus 6d6 Suppress Electronics

END: 148

Range: 30 million kilometers

Description: See below.

Cost	Powers	END
149	Medium Spinal Meson Gun: (Total: 750 Active Cost, 149 Real Cost) RKA 15d6, MegaScale (1" = 1,000 km; +1), Area Of Effect (180" Line; +1) (675 Active Points); OIF Immobile (-1 1/2), Crew-Served ([17-32] people; -1 1/4), Limited Arc Of Fire (Only on same horizontal level; -1), Extra Time (1 Turn (Post-Segment 12), Only to Activate, -3/4), Increased Endurance Cost (x2 END; -1/2) (Real Cost: 112) plus Suppress 6d6, Variable Special Effects (Any SFX; All Unshielded Electronics; +1/2), MegaScale (1" = 1,000 km; +1) (75 Active Points); Custom Modifier (Linked to Spinal Meson Gun; -1/2), Increased Endurance Cost (x2 END; -1/2) (Real Cost: 37)	148

HEAVY SPINAL MESON GUN

Effect: RKA 18d6, NND (Does BODY) plus 8d6 Suppress Electronics

END: 206

Range: 30 million kilometers

Description: See below.

Cost	Powers	END
215	<i>Heavy Spinal Meson Gun:</i> (Total: 1027 Active Cost, 215 Real Cost) RKA 18d6, NND ([Standard]; Meson Screens or Black Globes; +1), MegaScale (1" = 10,000 km; +1 1/4) (877 Active Points); OIF Immobile (-1 1/2), Crew-Served ([17-32] people; -1 1/4), Limited Arc Of Fire (Only on same horizontal level; -1), Extra Time (1 Turn (Post-Segment 12), Only to Activate, -3/4), Increased Endurance Cost (x2 END; -1/2), Beam (-1/4) (Real Cost: 140) plus Suppress 8d6, Variable Special Effects (Any SFX; All Unshielded Electronics; +1/2), NND ([Standard]; Meson Screens or Black Globes; +1), MegaScale (1" = 10,000 km; +1 1/4) (150 Active Points); Custom Modifier (Linked to Spinal Meson Gun; -1/2), Increased Endurance Cost (x2 END; -1/2) (Real Cost: 75)	206

TYPE T SPINAL MESON GUN

Effect: RKA 13d6+1, NND (Does BODY)

END: 180

Range: 30 million kilometers

Description: See below.

156	<i>Type T Spinal Meson Gun:</i> RKA 13d6+1, NND ([Standard]; Force field or meson screen; +1), Does BODY (+1), MegaScale (1" = 10,000 km; +1 1/4), Can Be Scaled Down (+1/4) (900 Active Points); Extra Time (1 Turn (Post-Segment 12), -1 1/4), Limited Arc Of Fire (One hex row; Only on same horizontal level; -1), OIF Bulky (-1), Crew-Served ([9-16] people; -1), Increased Endurance Cost (x2 END; -1/2)	180
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Particle Accelerators

Particle Accelerator weapons fire subatomic particles at high speeds, but the speeds are only possible in space. They cannot be used in an atmosphere.

50-TON PARTICLE ACCELERATOR BAY

Effect: RKA 13d6+1, NND (Does BODY)

END: 180

Range: 30 million kilometers

Description: See below for various versions.

50 Ton PAW Bay: (Total: 443 Active Cost, 120 Real Cost) RKA 8 1/2d6, Area Of Effect (104" Line; +1), MegaScale (1" = 100 km; +3/4), Can Be Scaled Down 1" = 1km (+1/4) (390 Active Points); OIF Bulky (-1), Increased Endurance Cost (x2 END; -1/2), Custom Modifier (Cannot be used in atmospheres; -1/2), Custom Modifier (60 degree firing arc on same level; -1/2), Crew-Served (2 people; -1/4), Real Weapon (-1/4) (Real Cost: 97) plus Suppress 4d6, MegaScale (1" = 100 km; +3/4), Can Be Scaled Down 1" = 1km (+1/4) (40 Active Points); OIF Bulky (-1), Linked (Meson Beam; -1/2), Increased Endurance Cost (x2 END; -1/2), Custom Modifier (60 degree firing arc on same level; -1/2), Crew-Served (2 people; -1/4), Real Weapon (-1/4) (Real Cost: 10) plus +4 with any single attack with one specific weapon (Real

Cost: 4) plus Penalty Skill Levels: +6 vs. Range Modifier with a single attack (Real Cost: 9)

100 Ton PAW Bay: (Total: 533 Active Cost, 143 Real Cost) RKA 10 1/2d6, Area Of Effect (128" Line; +1), MegaScale (1" = 100 km; +3/4), Can Be Scaled Down 1" = 1km (+1/4) (480 Active Points); OIF Bulky (-1), Increased Endurance Cost (x2 END; -1/2), Custom Modifier (Cannot be used in atmospheres; -1/2), Custom Modifier (60 degree firing arc on same level; -1/2), Crew-Served (2 people; -1/4), Real Weapon (-1/4) (Real Cost: 120) plus Suppress 4d6, MegaScale (1" = 100 km; +3/4), Can Be Scaled Down 1" = 1km (+1/4) (40 Active Points); OIF Bulky (-1), Linked (Meson Beam; -1/2), Increased Endurance Cost (x2 END; -1/2), Custom Modifier (60 degree firing arc on same level; -1/2), Crew-Served (2 people; -1/4), Real Weapon (-1/4) (Real Cost: 10) plus +4 with any single attack with one specific weapon (Real Cost: 4) plus Penalty Skill Levels: +6 vs. Range Modifier with a single attack (Real Cost: 9)

Particle Accelerator Barbette: (Total: 328 Active Cost, 106 Real Cost) RKA 6 1/2d6, Area Of Effect (80" Line; +1), MegaScale (1" = 100 km; +3/4), Can Be Scaled Down 1" = 1km (+1/4) (300 Active Points); OIF Bulky (-1), Increased Endurance Cost (x2 END; -1/2), Custom Modifier (Cannot be used in atmospheres; -1/2), Real Weapon (-1/4) (Real Cost: 92) plus Suppress 2d6, MegaScale (1" = 100 km; +3/4), Can Be Scaled Down 1" = 1km (+1/4) (20 Active Points); OIF Bulky (-1), Linked (Meson Beam; -1/2), Increased Endurance Cost (x2 END; -1/2), Real Weapon (-1/4) (Real Cost: 6) plus +2 with any single attack with one specific weapon (Real Cost: 2) plus Penalty Skill Levels: +4 vs. Range Modifier with a single attack (Real Cost: 6)

Light Spinal Particle Accelerator: (Total: 647 Active Cost, 121 Real Cost) RKA 13d6, MegaScale (1" = 1,000 km; +1), Area Of Effect (156" Line; +1) (585 Active Points); OIF Immobile (-1 1/2), Crew-Served ([17-32] people; -1 1/4), Limited Arc Of Fire (180 degrees; Only on same horizontal level; -1), Extra Time (1 Turn (Post-Segment 12), Only to Activate, -3/4), Increased Endurance Cost (x2 END; -1/2), Custom Modifier (cannot be used in atmospheres; -1/2) (Real Cost: 90) plus Suppress 5d6, Variable Special Effects (Any SFX; All Unshielded Electronics; +1/2), MegaScale (1" = 1,000 km; +1) (62 Active Points); Custom Modifier (Linked to Spinal Meson Gun; -1/2), Increased Endurance Cost (x2 END; -1/2) (Real Cost: 31)

Medium Spinal Particle Accelerator: (Total: 780 Active Cost, 156 Real Cost) RKA 15d6, MegaScale (1" = 1,000 km; +1), NND (Meson Screens or Force fields; +1) (675 Active Points); OIF Immobile (-1 1/2), Crew-Served ([17-32] people; -1 1/4), Limited Arc Of Fire (180 degrees; Only on same horizontal level; -1), Extra Time (1 Turn (Post-Segment 12), Only to Activate, -3/4), Increased Endurance Cost (x2 END; -1/2), Custom Modifier (cannot be used in atmospheres; -1/2) (Real Cost: 104) plus Suppress 6d6, Variable Special Effects (Any SFX; All Unshielded Electronics; +1/2), MegaScale (1" = 1,000 km; +1), NND (Meson Screens or Force fields; +1) (105 Active Points); Custom Modifier (Linked to Spinal Meson

*Gun; -1/2, Increased Endurance Cost (x2 END; -1/2)
(Real Cost: 52) 154*

Heavy Spinal Particle Accelerator: *(Total: 987 Active Cost, 190 Real Cost) RKA 18d6, Area Of Effect (242" Line; +1), MegaScale (1" = 10,000 km; +1 1/4) (877 Active Points); OIF Immobile (-1 1/2), Crew-Served ([17-32] people; -1 1/4), Limited Arc Of Fire (180 degrees; Only on same horizontal level; -1), Extra Time (1 Turn (Post-Segment 12), Only to Activate, -3/4), Increased Endurance Cost (x2 END; -1/2), Custom Modifier (cannot be used in atmospheres; -1/2) (Real Cost: 135) **plus** Suppress 8d6, Variable Special Effects (Any SFX; All Unshielded Electronics; +1/2), MegaScale (1" = 10,000 km; +1 1/4) (110 Active Points); Custom Modifier (Linked to Spinal Meson Gun; -1/2), Increased Endurance Cost (x2 END; -1/2) (Real Cost: 55)*

Fusion Guns

Dual Fusion Gun Turret-12: *RKA 6 1/2d6, Area Of Effect Nonselective (One Hex; +1/4), Armor Piercing (+1/2), MegaScale (1" = 100 km; +3/4), Can Be Scaled Down 1" = 1km (+1/4), Autofire (2 shots; +1 1/4) (400 Active Points); OIF Immobile (-1 1/2), Crew-Served (2 people; -1/4), Real Weapon (-1/4), Reduced By Range (-1/4). Total Cost: 123 points*

Plasma Guns

50 Ton Plasma Gun Bay-12: *RKA 9 1/2d6, Area Of Effect Nonselective (One Hex; +1/4), Armor Piercing (+1/2), MegaScale (1" = 1,000 km; +1), Can Be Scaled Down 1" = 1km (+1/4) (435 Active Points); OAF Bulky (-1 1/2), Extra Time (1 Turn (Post-Segment 12), -1 1/4), Increased Endurance Cost (x2 END; -1/2), Custom Modifier (Limited Arc of Fire, 2 Hexsides; -1/2), Crew-Served (2 people; -1/4), Real Weapon (-1/4), Reduced By Range (-1/4). Total Cost: 79 points.*

Note: Maximum Range of 39,000 km

Missiles

MISSILE RACK

A missile rack contains 12 conventional missiles, which may be fired singly upon a successful target lock. Although highly accurate with non-moving targets, the travel time and physical nature of missiles makes them susceptible to interception before they can reach their target.

Effect: RKA 6½d6 Explosion

Shots: 12

Range: 1,500,000 kilometers

Missile Rack: (Total: 818 Active Cost, 371 Real Cost) RKA 6 1/2d6, Explosion (+1/2) (150 Active Points); OIF Bulky (-1), Limited Power Must Have Viable Target Lock To Fire Missile (-1/2), Limited Power Must Travel To Target: Velocity 40,000" per phase (-1/2), Real Weapon (-1/4), 12 Charges (-1/4), Can Be Missile Deflected (-1/4) (Real Cost: 40) **plus** Variable Advantage (+1 1/2 Advantages; Limited Group of Advantages;

MegaScale or Increased Maximum Range plus Reduced Range Mod only; +2 3/4 for up to 150 Active Points of Missile, Reduced Endurance (0 END; +1/2) (618 Active Points); OIF Bulky (-1) (Real Cost: 309) **plus** +10 with Ranged Combat (50 Active Points); OIF Bulky (-1), Real Weapon (-1/4) (Real Cost: 22)

5 TON MISSILE POD

Each pod takes up 5 displacement tons of space (10 Hexes) and contains 125 standard space combat missiles, with either kinetic energy (KE, treated as AP) or High Explosive (Explosion). The pods are mounted in cargo bays or small craft bays.

Effect: RKA 6½d6 Explosion, AF(5)

Shots: 125

Range: 1,500,000 kilometers

Five Ton Missile Pod: (Total: 2100 Active Cost, 954 Real Cost) RKA 6 1/2d6, Explosion (+1/2), 125 Charges (Recovers Under Limited Circumstances; Base or Tender to Reload Pods, cannot be loaded from inside the ship; +1), Autofire (5 shots; +1 1/2) (400 Active Points); OIF Bulky (-1), Limited Power Must Have Viable Target Lock To Fire Missile (-1/2), Limited Power Must Travel To Target: Velocity 40,000" per phase (-1/2), Real Weapon (-1/4), Can Be Missile Deflected (-1/4), Crew-Served (2 people; -1/4) (Real Cost: 107) **plus** Variable Advantage (+1 1/2 Advantages; Limited Group of Advantages; MegaScale or Increased Maximum Range plus Reduced Range Mod only; +2 3/4 for up to 400 Active Points of Missile, Reduced Endurance (0 END; +1/2) (1650 Active Points); OIF Bulky (-1) (Real Cost: 825) **plus** +10 with Ranged Combat (50 Active Points); OIF Bulky (-1), Real Weapon (-1/4) (Real Cost: 22)

SMALL MISSILE BAY

A small missile bay contains 1000 space combat missiles, either kinetic energy (KE, treated as AP) or High Explosive (Explosion).

Effect: RKA 8d6 Explosion, AF(20)

Shots: 1000

Range: 1,500,000 kilometers

Small Missile Bay: (Total: 3125 Active Cost, 1400 Real Cost) RKA 8d6, Explosion (+1/2), 1000 Charges (Recovers Under Limited Circumstances; Base or Tender to Reload Pods, cannot be loaded from inside the ship; +1), Autofire (20 shots; +2 1/2) (600 Active Points); OIF Bulky (-1), Limited Power Must Have Viable Target Lock To Fire Missile (-1/2), Limited Power Must Travel To Target: Velocity 40,000" per phase (-1/2), Crew-Served ([3-4] people; -1/2), Real Weapon (-1/4), Can Be Missile Deflected (-1/4), Limited Arc Of Fire (180 degrees; -1/4) (Real Cost: 141) **plus** Variable Advantage (+1 1/2 Advantages; Limited Group of Advantages; MegaScale or Increased Maximum Range plus Reduced Range Mod only; +2 3/4 for up to 600 Active Points of Missile, Reduced Endurance (0 END; +1/2) (2475 Active Points); OIF Bulky (-1) (Real Cost: 1237) **plus** +10 with Ranged Combat (50 Active Points); OIF Bulky (-1), Real Weapon (-1/4) (Real Cost: 22)

SANDCASTER LAUNCHER

Effect: 50% Resistant Physical and Energy Damage Reduction
END: 8
Range: 600,000 kilometers

Sandcaster Launcher: (Total: 74 Active Cost, 16 Real Cost) Energy Damage Reduction, Resistant, 50%, 12 Continuing Charges lasting 1 Turn each (+1/4) (37 Active Points); OIF Bulky Fragile (-1 1/4), Ablative BODY or STUN (-1), Custom Modifier (only stops laser, plasma, or fusion fire; -1), Real Armor (-1/4), Costs Endurance (Only Costs END to Activate; -1/4) (Real Cost: 8) **plus** Physical Damage Reduction, Resistant, 50%, 12 Continuing Charges lasting 1 Turn each (+1/4) (37 Active Points); OIF Bulky Fragile (-1 1/4), Ablative BODY or STUN (-1), Custom Modifier (only stops laser, plasma, or fusion fire; -1), Real Armor (-1/4), Costs Endurance (Only Costs END to Activate; -1/4) (Real Cost: 8)

MESON SCREEN

Meson Screen: (Total: 120 Active Cost, 26 Real Cost) Physical Damage Reduction, Resistant, 75% (60 Active Points); OIF Immobile (-1 1/2), Custom Modifier (only stops damage from Meson weapons and radiation effects; -1), Crew-Served ([3-4] people; -1/2), Costs Endurance (-1/2) (Real Cost: 13) **plus** Energy Damage Reduction, Resistant, 75% (60 Active Points); OIF Immobile (-1 1/2), Custom Modifier (only stops damage from Meson weapons and radiation effects; -1), Crew-Served ([3-4] people; -1/2), Costs Endurance (-1/2) (Real Cost: 13)

NUCLEAR DAMPERS

Nuclear Damper: (Total: 120 Active Cost, 26 Real Cost) Physical Damage Reduction, Resistant, 75% (60 Active Points); OIF Immobile (-1 1/2), Custom Modifier (only stops damage from nuclear weapons and radiation effects; -1), Crew-Served ([3-4] people; -1/2), Costs Endurance (-1/2) (Real Cost: 13) **plus** Energy Damage Reduction, Resistant, 75% (60 Active Points); OIF Immobile (-1 1/2), Custom Modifier (only stops damage from nuclear weapons and radiation effects; -1), Crew-Served ([3-4] people; -1/2), Costs Endurance (-1/2) (Real Cost: 13)

SHIP'S VEHICLES

A ship may have one or more subordinate vehicles specified as part of the ship's equipment, and tonnage may be devoted to the permanent stowage or hangarage of the vehicles. The vehicles list indicates those vehicles and small craft commonly available.

Air/rafts, ATVs, GCarriers, and speeders are described in the chapter on Vehicles. In most cases, vehicles will have ports or bay doors opening to the outside; air/rafts, GCarriers, and speeders can reach orbit, and are often launched to

a world surface from orbit. If an ATV is carried, provision must be made to move it to a world surface if the ship is not streamlined (unless the vehicle is intended for use only on worlds without atmospheres).

When small craft are carried on a ship, it must have sufficient tonnage to hold each small craft allocated as small craft hangars or compartments.

Small Craft Design

Vessels under 100 tons are considered to be small craft. There are eight standard designs available; each design plan is available for Cr100. All take approximately twelve months to build. All are streamlined, and can enter atmospheres. All can operate with unrefined fuel; they have fuel scoops which allow them to skim fuel from a gas giant. Each small craft design is intended to be as useful as possible. As a result, the description covers basic performance of the craft, and indicates price, crew, and other details. Each craft also has a feature called excess space: this interior tonnage may be used by the purchaser for a wide variety of purposes. In effect, when the craft is procured, it is customized by the purchaser for some specific use. Any fitting or combination of fittings shown on the fitting table may be specified for a standard design small craft. The prices, however, are ignored, and are considered to be included in the standard design price. For example, the launch, with 13 tons excess space, could utilize that space for 5 tons of fuel, 10 passenger couches, a small craft cabin, and one ton of cargo. As another example, the vessel could have all 13 tons allocated to cargo. In either case, the price of the launch remains MCr14.

Fittings: The fittings table indicates items which may be allocated to small craft. Staterooms, low berths, and emergency low berths are the same as those used in larger ships. The small craft cabin is a small, one-passenger stateroom for use on longer duration voyages. It can be used double occupancy on small craft which have no bridge, but the crew will become increasingly uncomfortable. Small craft couches are individual passenger seats; one is required for each passenger carried (if a stateroom or cabin is not provided). Each small craft except the fighter already has two small craft passenger couches installed (the fighter has one). Cargo and fuel tankage are simply allocated; one ton of cargo space carries one ton of cargo, while one ton of fuel tankage carries one ton of fuel. The fuel tankage listed for each small craft supports four weeks of operation. Each additional increment of fuel tonnage added supports an additional four weeks of operation.

Fitting Description	Tons	Cost (in Cr)
Stateroom	4.0	500,000
Low Berth	0.5	50,000
Emergency Low Berth	1.0	100,000
Small Craft Stateroom	2.0	50,000
Small Craft Couch	0.5	25,000
Cargo - as required		
Fuel - as required		

Listed crew for all small craft except the fighter is two: pilot and rider. The craft may be operated by one pilot if desired. The pilot must have *Transport Familiarity (Ship's Boat)* skill (or may *Combat Piloting* with the associated familiarity). The rider may be a gunner, a passenger, or a co-pilot. If the craft is armed, but carries no gunner, the pilot may fire the weapon with a DM of -1 on the weapon (with an additional -3 if he does not have the proper Weapon Familiarity).

Computers may be added to small craft, but such computers must be purchased normally. Specific computer restrictions are indicated in the small craft descriptions.

Weaponry may be added to small craft. Each small craft may allocate one ton to weaponry and install up to three weapons. The individual listings indicate specific weapons which are available for the small craft.

Below are eight standard small craft descriptions.

Launch (also called Lifeboat): Using a 20-ton hull, the launch is capable of 1G acceleration, carries 1 ton of fuel tankage, and has a crew of two. A launch may mount missile racks and sandcasters; it may not mount lasers. The maximum computer for the launch is the Model/2bis. The craft has 13 tons excess space available for custom use, and costs MCr14.

Ship's Boat: Using a 30-ton hull, the ship's boat is capable of 6G acceleration, carries 1.8 tons of fuel tankage, and has a crew of two. A ship's boat may mount one beam or pulse laser; remaining weapons must be missile racks and sandcasters. The maximum computer for the ship's boat is the Model/3; if the computer is Model/3, lasers may not be mounted. The craft has 13.7 tons of excess space available, and costs MCr16.

Slow Boat: Using a 30-ton hull, the slow boat is capable of 1 of 3G acceleration, carries 1 ton of fuel tankage, and has a crew of two. A slow boat may mount one beam or pulse laser; remaining weapons must be missile racks or sandcasters. The maximum computer for the slow boat is the Model/3; if the computer is Model/3 lasers may not be installed. The craft has 19.9 tons of excess space, and costs MCr15.

Pinnacle: Using a 40-ton hull, the pinnacle is capable of 5G acceleration, carries 2 tons of fuel, and has a crew of two. It may mount two lasers, and any remaining weapons must be missile racks or sandcasters. The maximum computer for the pinnacle is the Model/4. If a Model/3 is installed, only one laser may be mounted; if a Model/4 is installed, no lasers may be installed. The craft has 22.4 tons of excess space, and costs MCr20.

Slow Pinnacle: Using a 40-ton hull, the slow pinnacle is capable of 2G acceleration, carries 1 ton of fuel, and has a crew of two. It may mount one beam or pulse laser; remaining weapons must be missile racks or sandcasters. The maximum computer for the slow pinnacle is the Model/3; if the computer is a Model/3, lasers may not be mounted. It has 31.6 tons excess space, and costs MCr18.

Modular Cutter: Using a 50-ton hull, the cutter is capable of 4G, carries 2 tons of fuel, and has a crew of 2. It has 30 tons committed to special detachable modules; the craft has 2.5 tons excess space available for weaponry, computer, and possibly a couch for a third crew member. The cutter may mount up to two lasers; remaining weapons must be missile racks or sandcasters. The maximum computer for the cutter is the Model/4. If a Model/3 is installed, only one laser may be mounted; if a Model/4 is installed no lasers may be mounted. The cutter, without any modules, costs MCr28. Three interchangeable modules are routinely available for the modular cutter.

The ATV module (which includes an operational ATV) is 30 tons. It can land (and retrieve) an ATV on a world surface from orbit. The module can serve as an ATV storage location, if desired. It costs MCr1.8.

The fuel module, with 30 tons of fuel tankage, serves as a fuel skimming vehicle and storage tank. It costs MCr1.

The open module is a customizable frame with 30 tons

of excess space which can be allocated to passenger couches, fuel, cargo, cabin, or staterooms. It costs MCr2.

Shuttle: Using a 95-ton hull, the shuttle is capable of 3G acceleration, carries 2.85 tons of fuel, and has a crew of 2. It may mount up to two lasers; remaining weapons must be missile racks or sandcasters. The maximum computer for the shuttle is the Model/4. If a Model/3 is installed, only one laser may be mounted; if a Model/4 is installed, no lasers are allowed. It has 71 tons of excess space, and costs MCr33.

Fighter: Using a 10-ton hull, the fighter is capable of 6G acceleration, carries 1 ton of fuel, and has a crew of one. It includes a computer Model/1 and can mount only one type of weapon: one laser, up to three missile racks, or up to three sandcasters. The maximum computer for the fighter is the Model/3; if a Model/3 is installed, then no lasers are permitted. It has one ton of excess space, and costs MCr18.