

VEHICLES

Vehicles often play a part in TFT adventures. The following chapter lists some common vehicles that will be available to players and how they translate to game terms to allow for exciting chases and combats.

Because of the wide variety of sizes allowed for vehicles there are *three* scales of play vehicles are used in.

- (1) **Normal Combat Scale** (1 hex = 1.3 meters) - Many vehicles can be used in 'normal' scale that allows characters to interact with vehicles as they normally do.
- (2) **Vehicle Combat Scale** (1 hex = 1 Mh) - Most normal vehicle combat and mass army combat occurs at this scale.
- (3) **Mass Combat Scale** (1 hex = 1 MMh) - Large scale combat of armies - with 30 figures per hex occur at this scale as well as aircraft combat. After this the scale is entirely arbitrary as suits the needs of the story - for example, space combat can occur at whatever distance per hex the gm desires.

VEHICLE CONSTRUCTION

The following rules are for the construction of three different types of vehicles in METAVVERSE:

- **Ancient - Ships** - These the rules for constructing ancient sail and/or oar vessels. *These are based on the construction rules for Ram Speed® Metagaming and 7th Seas by Alderac.*
- **Modern - Vehicles** - These are the default construction rules for most vehicles, including motorcycles, boats, hovercraft, helicopter, planes, jets, powered armor and battlesuits, snowmobiles, etc. *These are based on the construction rules for Car Wars/Mini-Car Wars® SJG and Ogre by Steve Jackson Games.*
- **Future - Spacecraft** - These the rules for constructing Warp capable and hyperdrive capable space vehicles. *These are based on the construction rules for Warp War® Metagaming and Ogre by Steve Jackson Games.*

VEHICLE ATTRIBUTES

GMs and players can chose from a wide variety of modern units, ranging from the monstrous Ogres, through many different sorts of armor vehicles, down to the battlesuits of the 'poor bloody infantry' - who are vehicles in their own right.

There are six characteristics which determine a unit's capabilities on the battlefield. Like character creation, these abilities are designed to make the vehicle balanced in a combat and tactical situation - leaving the Roleplaying to the players, not the rules. These are its **Attack Strength** and **Range**; its **Armor/Structure Points**; its **MOVE**, and the **Movement Mode** which determines how it handles various sorts of terrain; and its **Size**. Taken together with the unit's special abilities and accessories, these characteristics give it its **Build Point** value.

ATTACK STRENGTH (ATT)

This number represents the combat strength of a particular unit. A higher number means a greater attack capability - usually because of a larger weapon. Most units have a single attack strength. Infantry units have an attack strength based on the number of squads remaining in that unit; each squad has an attack strength of 1.

Attack strength also relates to detection ability; in general, larger units carry better electronics and have a better chance of accurately locating their targets.

Attack Strengths are considered to be 5d6 per 1 ATT with a practical limit of 8 (40d6) for planet-based weapons and ATT 12 (60d6) for space-based weapons.

RANGE (RNG)

This is the maximum distance, in inches, at which a unit may attack.

Vehicle units and infantry units have a single range for their fire. Each weapon system has its own particular attack range.

Range is considered to be 1 MH per 1-hex but this can vary greatly depending on the scale. In general consider the following practical limits to ranges:

Planet-based:	ATT	Maximum Range
	0-2	4
	3+	5-10

Space-based:	ATT	Weapon Type
	1-5	Beam - Full damage
	6-10	Beam - Half damage
	11-15	Beam - ¼ damage
	16+	Beam - No damage
	Drive setting x2	Missiles

DEFENSE STRENGTH (DEF)

This number represents the defensive strength of a particular unit. The higher the number, the better the unit defends. Each vehicle and infantry unit has a single defense strength. Defense strength is based on several factors: mobility (and ability to hide), electronic countermeasures, the point-defense weaponry carried by most units, and - perhaps *least* important - heavier armor. Camouflage is usually of no account at all, as the naked eye is more easily fooled than electronic detects - see p. ____.

Infantry units have a defense strength based on the number of squads remaining in that unit...the more squads, up to 3, the better the effect of their combined ECM and of their personal weapons in point-defense mode.

Each individual weapon system has its own defense strength, based on its durability and the vehicle's overall ECM and point defense.

Some units have a defense strength of 0. Such a unit is destroyed automatically if attacked.

Defense Strength is considered to be one hull type per Armor, so BPC armor is usually HS 7, ST 150 per Armor. A practical maximum of 6 for armor (HS 42, ST 600, costing 2 BP) and 9 for Screens.

ARMOR/STRUCTURE POINTS (SP)

Large buildings and other structures do not have Defense Strengths; instead, they have Structure Points. These are gradually worn down by attacks. Note that while units with Defense Strengths get defensive bonuses for some terrain, there is no terrain bonus for Structure Points; these buildings are too large to hide behind trees, disguise with ECM and so on.

SPEED (MOVE)

This number represents the maximum distance, in inches, that the unit may move, each turn, through *clear terrain*. Movement through different terrain can increase or decrease this distance. A unit never has to move, nor does it have to use its full movement allowance each turn. For example, a Heavy Tank has a movement value of 6. During its movement it can choose to remain stationary, or it can movement any distance up to a maximum of 6 hexes across the battlefield. Unused movement may not be saved from turn to turn.

Hovercraft, helicopters, planes and other vehicles that fly have a *split* movement value. For instance, a regular G.E.V. has a movement value of 4/3. This means that it has *two* movement phases per turn. It has a movement value of 4 for the regular movement phase, and a value of 3 for the second, G.E.V.-only movement phase, which takes place after

combat.

During its movement phase, any vehicle still capable of movement may always move forward at least 1 hex, regardless of any terrain modifiers.

MOVEMENT MODE (MODE)

This is a 3-letter abbreviation that represents the mode of travel used by the unit, as follows:

- Flight (HEL/PLN):** This movement type is used by all flight-capable vehicles. This includes aircraft of all types, helicopters and vectored thrust vehicles. Each aircraft's peculiar flight characteristics are provided by suitable Perks and Flaws (see *Perks and Flaws*, page 112).
- Ground (no code):** Any wheeled or tracked vehicle. Wheeled vehicles are assumed to be equipped with large wheels and strong suspension for rough terrain and thus are grouped with tracked vehicles in the Ground movement type for simplicity. Ordinary wheeled vehicles such as city cars have the Poor Off-Road Capacity Flaw to represent the low clearance of their drive system (see *Flaws*, page 128).
- Hover (GEV):** This movement type is used by all vehicles which travel above but near the ground, such as ground-effect hover craft and other air-cushion vehicles. Ground-effect systems only work within an atmosphere; they are useless in vacuum.
- Naval (WTR):** Any conventional water vessels and hydrofoils, or anything that can float. This only makes the vehicle's hull water-tight, however: it is still susceptible to flooding and capsizing if swamped or turned upside-down.
- Rail (RAIL):** Any vehicle which uses a rail or guide of some kind to move about is part of this category. This includes classic steel railroad trains, MagLevs, monorails and many others. These vehicles can only move along a rail line, and the rail(s) must be of the same type as the one the movement system was designed for.
- Space (SPACE):** A vehicle equipped with reaction thrusters uses this movement system. This movement type does not confer the ability to perform standard atmospheric flight or reentry – these must be purchased separately.
- Submarine (SUB):** This movement type covers underwater craft of all sorts, which are fully watertight. Most Submarine vehicles also have the Naval movement type, but it is not required (some submarine vehicles fare very poorly on the surface).
- Walker (WLK):** This represents a multi-legged walking vehicle. The exact number of legs present is totally up to the designer and has no bearing on either speed and toughness, which are determined separately (see *Speed* below, and *Perks and Flaws*, page 112).

SPEED

A Top Speed, measured in miles per hour, must be selected for each individual movement type. Each Top Speed is divided by fifteen (15) to get the Top Speed in Speed, rounding to the nearest whole number.

Multiple Movement Modes Strike Mecha have a double movement code. This allows the owning player, at the beginning of his turn, to choose the mode he wishes to use. Once chosen, however, all restrictions pertinent to that mode are applied in full until it changes modes again. Should the machine become disabled, for whatever reason, it cannot change modes until it has fully recovered. The current movement mode is indicated by a small counter near the base of the figure (no marker being walker mode).

SIZE (SIZE)

This is an abstract measure of the vehicle's size and weight; see the *Size Table*, p. __. Size is mainly used to determine how hard it is to push an inert unit around, and what a unit can hide behind, as well as how many weapons and accessories can fit into the frame. Size is not important for buildings.

BUILD POINT VALUE (BP)

This is the "cost" of the unit in scenarios where the players can choose their own vehicles.

A BP is basically a unit of money. For example, suppose the players save an alien from death, and he decides to reward them by giving them a spaceship. The alien might give the players a spaceship with 20 BP on it, of their choice. If they take a Danger Room, it cost as much money (3 BP) as a Cloaking Device, but is of no value in combat. The players have to balance comfort against power.

The option cost of an item depends on only on its usefulness, but also on its availability in a given society. The luxury options are less commonly available, because they are harder to produce.

REAL WORLD VEHICLE CONVERSION

Dimensions: Multiply Length x Width x Height.

Length: In inches is divided by 52 (inch/52) = hexes. Use hexes to determine **Size**, remembering to add width.

Width: In inches is divided by 52 (inch/52) = hexes. Use hexes to determine **Size**, remembering to add length.

Height: In inches is divided by 52 (inch/52) = hexes. Use hexes to determine **Size**, remembering to add length and width.

Example: A Ferraris is 167.5 inches long by 67.7 inches wide and 44.1 inches high.

$$\begin{aligned} 167.5/52 &= 3.22 \\ 67.7/52 &= 1.30 \\ 44.1/52 &= 0.84 \\ \hline 3.22 \times 1.30 \times 0.84 &= 3.51624 \text{ hexes Size } 1/3 \end{aligned}$$

Wheelbase	Size
0 to 100	= Size 1/3 (Subcompact frame)
101 to 500	= Size 1/2 (Compact frame)
106+	= Size 1 (Mid-sized or more)

Acceleration 0-60 mph (sec)	ACC
11.8 to 15	= ACC 1
6.2 to 8.7	= ACC 2
4.5	= ACC 3

Horsepower (hp)	Power/Drive (PD = 380 hp/1 PD)
Up to 95 hp	= ¼ PD
96 to 127 hp	= 1/3 PD
128 to 190 hp	= ½ PD
191 to 380 hp	= 1 PD
381 to 760 hp	= 2 PD
761 to 1140 hp	= 3 PD
1141 to 1520 hp	= 4 PD
1521 to 1900 hp	= 5 PD
1901 to 2280 hp	= 6 PD
2281 to 2660 hp	= 7 PD
2661 to 3040 hp	= 8 PD
3041 to 3420 hp	= 9 PD
3421 to 3800 hp	= 10 PD
	28 PD
	Dreadnought

Watts	Power/Drive (PD = 380 hp/1 PD)
283,365.96 watts	= 1 PD
1 hp = 745.6999 watts	

VEHICLE DESIGN NOTES

Bio-Constructs Bio-constructs are vehicles, machines and robots made of living flesh rather than mechanical components. They may be engineered or naturally bred, and their characteristics may vary wildly. They are somewhat rare, since most applications are easily done by more resilient machines. For game simplicity, Bio-constructs are built just like any other vehicles or machines. In this case, "Crew" indicates not only any onboard crew (if applicable) but also the state of the creature's nervous system (pain and damage will cause actions to be lost). Especially tough or resilient creatures might well have several levels of the Perk "Reinforced Crew" (in this case, it would read as "Tough Nervous System"). Most living beings will also have Self-Repair Systems (see page 148) to simulate their ability to heal naturally.

VEHICLE CONSTRUCTION

The following rules describe a process where players may design their own vehicles and then calculate a Build Point Value for these new vehicles. The process of building a vehicle has three steps:

- (1) Constructing a Hull
- (2) Adding Weapons to the Hull
- (3) Adding Accessories to the Hull
- (4) Determining a Build Point Value for the new Vehicle

CONSTRUCTING A HULL

Every vehicle has a hull. It contains the controls, electronics, gas/

electrical/nuclear Power Plants/Drives to power the vehicle, sensor devices, Structural Points and armor to protect these items. Only the Power/Drives, Structural Points, and Armor are added by the player. Everything else comes for free.

There are three phases to hull construction:

- Deciding on the size of the hull (Size)
- Assign a movement rate (PD and Speed)
- Add Structure Points (SP) and Armor (A)

DECIDING ON THE SIZE OF THE HULL (SIZE)

A hull may have a "Size" of between 1/3 and 64 or more.

Fractional amount of Size are only allowed in "half" units; i.e., a hull may have a Size of 24-1/2 (24.5), but not a size of 23-1/3 with the single exception of the very small vehicles meant to represent bicycles, powered exoskeletons, jet packs, go-carts and other small vehicles that can still be built with these rules. Designers are free to pick any size hull they wish within those limitations. The BP value of a Vehicle increases with hull size at a rate of 1 BP per 1 Size.

Spaces are Car Wars Spaces for comparison/conversion purposes

Size Assumes One Battlesuit Infantry is 5-6 men and Militia is 20 men and worth 1/3 BP. For references purposes, the following is an OGRE Size Conversion

OGRE	TFT	Examples from Ogre
1	1	Light Tank, LGEV, Truck, INF squad
2	2	GEV, Missile Tank, archaic MBT or APC
3	3	Heavy Tank, GEV-PC
4	4	Missile Crawler, Mobile CP, LHWZ, HWZ, MHWZ
5	5	Superheavy, Ogre Mark I
6	6-10	Ogre Mark II
7	11-22	Ogre Mark III, III-B, Ninja
8	23-30	Ogre Mark IV, V, Fencer
9	31-50	Ogre Mark VI, Doppelsoldner

Hexes is the approximate maximum

Weight is the approximate weight in tons of 2,000 lb. each.

Ram is the damage that occurs in a Ram attack. This is in ATT (or vehicle) scale. Multiply x5 for figure scale.

SIZE	Space	Example Vehicles
0.25	0	Bicycle
0.25	1	Rocket Pack
0.25	2	Lt. sidecar
0.25	3	Hvy. Sidecar, Mini-Van Trailer, Regular Balloon, Lt. Battlesuit, Go-Kart
0.25*	4	Lt. Cycle, Lt. Aquabike, Lt. Snowmobile, Small Assault Power Armor, WaterSled (1 person), Light Microcopter, Light Mini-Car
0.25	5	Med. Cycle, Large Balloon, Med. Snowmobile, Med. Assault Power Armor, Med. <u>Battlesuit</u> , Water Sled (2 person), Med. Microcopter, Med. Mini-Car
0.33	6	Rowboat, Med. Aquabike, Lg. Assault Power Armor, Large Water Sled, One Man Sub, Hvy. Microcopter, Hvy. Mini-Car
0.33	7	Subcompact, Hvy. Cycle, Hvy. Snowmobile, Subcompact Sand Rail, Hvy. Battlesuit, Recon Powered Armor, X-Hvy. Microcopter
0.33	8	Flatbed trailer 6', Hvy. Aquabike, One-Man Hovercraft, Small Microplane, Sub-compact <u>Carplane</u> , One-Man Hoverplane, Small Truck, X-hvy. Battlesuit
0.5	9	Medium Truck, Mini Sub
0.5	10	Compact, Sprint Racing car, Dinghy boat, Compact Carplane, Compact Sand Rail, S- <u>hvy</u> Battlesuit, Standard Powered Armor, Lt. Circle Car, Lt. Wheel Car, Lt. Tread Car
1	12	Van 6' trailer, Med. Microplane, Small Airplane, Hvy Circle Car
1	13	Mid-sized Car, Flatbed 10', One-Man Helicopter, Small Grasshopper, Mid-Sized Carplane, Mid-sized Sand Rail, Med. Wheel Car, Med. Tread Car
1	14	Small Hovercraft, Small Hoverplane, Small Walker
1	15	Formula One/Indy Racer, Standard Formula 1 Body, Small Sleight
1	16	Sedan, Dragster, Med. Grasshopper, Sedan Sand Rail, Heavy Powered Armor, Hvy. Wheel Car, Hvy Tread Car
1	17	Cabover, Lg. Microplane, Standard Walker, Long Wheelbase Formula 1 Body
1	18	Can-Am, Standard Sleight
1	19	Luxury, Flatbed 15', Standard Cabover Big Rig, Small Helicopter, Lg. Grasshopper, Luxury Sand Rail, X-Hvy Wheel Car, X-Hvy Tread Car
1	20*	Funny Car, Van 10', Longnose, Speedboat, Standard Hovercraft, Micro Airship, Small <u>Armored Car</u> , Small Mecha
2	21	Station Wagon, Medium Airplane, Super Sleight
2	22	Standard Longnose, Large Walker
2	24	Pickup, Camper, Flatbed 20', Sleeper Cabover, Stretch-luxury car, Mini-Van, Pick-up Truck Sand Rail, Submarine (1-man)

2	25	Cargo Microplane, Armored Personnel Carrier (APC averages 20-30 spaces)
2	27	Sleeper Longnose, Large Hovercraft, Limousine
2	29	Flatbed 25', Double Sleeper Cabover
2	30	Van, Van 15' Trailer, Standard Helicopter, Stretch-pickup truck, Van Sand Rail, Med. Mecha, Stretch-Camper
2	32	Large Airplane, Small Jet Fighter, Double Sleeper Longnose, High-Rise Sleeper Longnose, Van-up
2	35	Flatbed 30', Minibus, Medium Armored Car, Mini Landmaster
2	36	Stretch-van, Fighter Microplane
2	37	Cruiser, High-Rise Double Sleeper Longnose
2	38	Van 20'
2	40	Large Cargo Microplane, Small Airship, Small Submarine
3	41	Small Cargo Hovercraft, Transport Helicopter
3	45	Bus 30', Large Mecha, Landmaster (30')
3	46	Van 25'
3	50	Flatbed 40' Trailer, Large Armored Car
3	51	Reg. Cargo Hovercraft, Standard Heavy Lift Helicopter
3	53	Large Jet Fighter
3	54	Van 30'
3	55	Small Heavy Lift Helicopter
3	58	Yacht
3	60	Tanker 40', Bus 40', Medium Airship, Flatbed Trailer (48'), Med. Submarine, Landmaster (40')
4	65	Flatbed Trailer (53')
4	70	Dual-Level Flatbed 40', Dumper 40', Heavy Fighter Plane
4	72	Tanker Trailer (48')
4	75	Reefer 40', Heavy Mecha
4	78	Tanker (53')
4	80	Van 40', Cargo Airplane, Small Fleet Patrol Boat, Lq. Submarine
5	82	Double Flatbed Trailer (53')
5	88	Reefer Trailer (48')
5	90	Double Flatbed Trailer (53')
5	95	Reefer Trailer (53')
5	96	Van (48')
5	100	X-Hvy. Mecha, Van Trailer (50'), Small Supertruck
5	104	Van (53')
5	110	Standard Airship
5	115	Large Cargo Airplane
6	120	X-Lg. Submarine
6	125	Large Heavy Lift Helicopter
7	150	Large Airship, Super-hvy Mecha
7	160	Heavy Transport Plane, Med. Fleet Patrol Boat, Super Submarine
8	180	Transport Airship
9	200	Titan Mecha, Med. Supertruck
11	240	Super Airship, Large Fleet Patrol Boat, Fleet Submarine
16	320	X-Large Fleet Patrol Boat
20	400	Super Fleet Patrol Boat, Lq. Supertruck
40	800	Hvy. Supertruck

ASSIGN A MOVEMENT RATE (PD AND SPEED)

A vehicle may have a Movement Rate of equal to half its Power/Drive size. Speed can also be rated in 1/4 and 1/2 values.

Speed is given in Vehicle scale and equals 1 inch per turn per Speed 1.

Split Speed is a rating given to very fast vehicles that are capable of flight such as hovercraft, airplanes and helicopters. The flexibility of these kinds of movements allow them to make TWO choices of maneuvers per turn. For instance, a hovercraft (GEV) has a Sped of 4/3. This means it has *two* maneuvers per turn. It has a Speed of 4 and may choose any Speed 4 maneuver for the regular movement phase, and a value of 3 for the second, Split-only movement phase, which takes place after combat.

In some cases there are TWO split speeds. Which one a particular vehicle uses depends on the maneuverability of the vehicle.

MPH is considered miles per hour and is an approximation for reference purposes

MA is considered figure scale Movement Allowance and is just given for comparison purposes.

PD is considered Power/Drive and is the amount of 'engine' required for the amount of Speed

Speed	Speed (flight)	MPH (average)	MA
1/4	-	1-5 mph (2.5 mph)	2
1/2	-	6-11 mph (7.5 mph)	6
1	-	12-23 mph (15 mph)	12
2	-	24-38 mph (30 mph)	24
3	2/1	39-53 mph (45 mph)	36

STANDARD VEHICLE SIZE TABLE

Size	Spaces	Hexes	Mass (tons)	Notes
0.25	0-5	1-3	0-1	
0.33	6-6.6	4-8	1-3	
0.5	7.6-10	9-15	3-5	
1	11-20	16-24	6-9	Light Tank, LGEV, Truck, INF squad, Small Mecha (25', \$100,000)
2	21-40	25-35	9-13	Penteconter, GEV, Missile Tank, archaic MBT (36-76 hexes) or APC, Medium Mecha (25', \$150,000)
3	41-60	36-48	13-17	Bireme, Heavy Tank, GEV-PC, Large Mecha (30', \$225,000)
4	61-80	49-63	18-23	Missile Crawler, Mobile CP, LHWZ, HWZ, MHWZ, Hvy Mecha (35', \$375,000)
5	81-100	64-80	23-29	Trireme, Superheavy, Ogre Mark I, X-Hvy Mecha (40', \$500,000)
6	101-120	81-99	29-36	Ogre Mark II
7	121-140	100-120	36-44	
8	141-160	121-143	44-52	S-Hvy Mecha (45', \$750,000)
9	161-180	144-168	52-61	Quinquireme
10	181-200	169-195	61-71	Ogre Mark II, Titan Mecha (50', \$1,000,000)
11	201-220	196-224	71-81	
12	221-240	225-255	82-93	
13	241-260	256-288	93-105	
14	261-280	289-323	105-118	
15	281-300	324-360	118-131	
16	301-320	361-399	131-145	
17	321-340	400-440	146-160	
18	341-360	441-483	160-176	
19	361-380	484-528	176-192	
20	381-400	529-575	192-209	
21	401-420	576-624	210-227	
22	421-440	625-675	227-246	Ogre Mark III-B
23	441-460	676-728	246-265	
24	461-480	729-783	265-285	Ogre Mark IV
25	481-500	784-840	285-306	
26	501-520	841-899	306-327	
27	521-540	900-960	327-349	
28	541-560	961-1023	350-372	
29	561-580	1024-1088	373-396	
30	581-600	1089-1155	396-420	Ogre Mark V (1140 hexes), Fencer
31	601-620	1156-1224	421-445	
32	621-640	1225-1295	446-471	
33	641-660	1296-1368	472-498	
34	661-680	1369-1443	498-525	
35	681-700	1444-1520	525-553	
36	701-720	1521-1599	553-582	
37	721-740	1600-1680	582-611	
38	741-760	1681-1763	612-641	
39	761-780	1764-1848	642-672	
40	781-800	1849-1935	673-704	
41	801-820	1936-2024	704-736	
42	821-840	2025-2115	737-769	
43	841-860	2116-2208	770-803	Ogre Mark VI
44	861-880	2209-2303	804-838	
45	881-900	2304-2400	838-873	
46	901-920	2401-2499	874-909	
47	921-940	2500-2600	910-946	
48	941-960	2601-2703	946-983	
49	961-980	2704-2808	984-1022	
50	981-1000	2809-2915	1022-1061	
51	1001-1020	2916-3024	1061-1100	
52	1021-1040	3025-3135	1101-1141	
53	1041-1060	3136-3248	1141-1182	
54	1061-1080	3249-3363	1182-1224	
55	1081-1100	3364-3480	1224-1266	
56	1101-1120	3481-3599	1266-1309	
57	1121-1140	3600-3720	1310-1353	
58	1141-1160	3721-3843	1354-1398	
59	1161-1180	3844-3968	1399-1444	
60	1181-1200	3969-4095	1444-1490	
61	1201-1220	4096-4224	1490-1537	
62	1221-1240	4225-4355	1537-1584	
63	1241-1260	4356-4488	1585-1633	
64	1261-1280	4489-4623	1633-1682	

4	-	54-68 mph (60 mph)	48
5	3/2	69-83 mph (75 mph)	60
6	-	84-98 mph (90 mph)	72
7	4/3	99-113 mph (105 mph)	84
8	4/4	114-128 mph (120 mph)	96
9	5/4	129-143 mph (135 mph)	108
10	5/5	144-158 mph (150 mph)	120
11	6/5	159-173 mph (165 mph)	132
12	6/6	174-188 mph (180 mph)	144
13	6/4/3	189-203 mph (195 mph)	156
14	6/4/4	204-218 mph (210 mph)	168
15	6/5/4	219-233 mph (225 mph)	180
16	6/5/5	234-248 mph (240 mph)	192
17	6/6/5	249-263 mph (255 mph)	204
18	6/6/6	264-278 mph (270 mph)	216
19	6/6/4/3	279-293 mph (285 mph)	228
20	6/6/4/4	294-308 mph (300 mph)	240
21	6/6/5/4	309-323 mph (315 mph)	252
22	6/6/5/5	324-338 mph (330 mph)	264
23	6/6/6/5	339-353 mph (345 mph)	276
24	6/6/6/6	354-368 mph (360 mph)	288
25	6/6/6/4/3	369-383 mph (375 mph)	300
26	6/6/6/4/4	384-398 mph (390 mph)	312
27	6/6/6/5/4	399-413 mph (405 mph)	324
28	6/6/6/5/5	414-428 mph (420 mph)	336
29	6/6/6/6/5	429-443 mph (435 mph)	348
30	6/6/6/6/6	444-458 mph (450 mph)	360
31	6/6/6/6/4/3	459-473 mph (465 mph)	372
32	6/6/6/6/4/4	474-488 mph (480 mph)	384
33	6/6/6/6/5/4	489-503 mph (495 mph)	396
34	6/6/6/6/5/5	504-518 mph (510 mph)	408
35	6/6/6/6/6/5	519-533 mph (525 mph)	420
36	6/6/6/6/6/6	534-548 mph (540 mph)	432
37	6/6/6/6/6/4/3	549-563 mph (555 mph)	444
38	6/6/6/6/6/4/4	564-578 mph (570 mph)	456
39	6/6/6/6/6/5/4	579-593 mph (585 mph)	468
40	6/6/6/6/6/5/5	594-608 mph (600 mph)	480
41	6/6/6/6/6/6/5	609-623 mph (615 mph)	492
42	6/6/6/6/6/6/6	624-638 mph (630 mph)	504
43	6/6/6/6/6/6/4/3	639-653 mph (645 mph)	516
44	6/6/6/6/6/6/4/4	654-668 mph (660 mph)	528
45	6/6/6/6/6/6/5/4	669-683 mph (675 mph)	540
46	6/6/6/6/6/6/5/5	684-698 mph (690 mph)	552
47	6/6/6/6/6/6/6/5	699-713 mph (705 mph)	564
48	6/6/6/6/6/6/6/6	714-728 mph (720 mph)	576
49	6/6/6/6/6/6/6/4/3	729-743 mph (735 mph)	588
50	6/6/6/6/6/6/6/4/4	744-758 mph (750 mph)	600
51	6/6/6/6/6/6/6/5/4	759-773 mph (765 mph)	612
52	6/6/6/6/6/6/6/5/5	774-788 mph (780 mph)	624
53	6/6/6/6/6/6/6/6/5	789-803 mph (795 mph)	636
54	6/6/6/6/6/6/6/6/6	804-818 mph (810 mph)	648
55	6/6/6/6/6/6/6/6/4/3	819-833 mph (825 mph)	660
56	6/6/6/6/6/6/6/6/4/4	834-848 mph (840 mph)	672
57	6/6/6/6/6/6/6/6/5/4	849-863 mph (855 mph)	684
58	6/6/6/6/6/6/6/6/5/5	864-878 mph (870 mph)	696
59	6/6/6/6/6/6/6/6/6/5	879-893 mph (885 mph)	708
60	6/6/6/6/6/6/6/6/6/6	894-908 mph (900 mph)	720

Speed	Speed (flight)	Maximum Speeds (Size)
2	-	Walker (2+)
3	2/1	Walker (1)
4	-	Walker's Ground, Naval (hull), Submarine (1/3+)
5	3/2	Submarine (1/4 or less)
6	-	Ground (1 1/2 or more)
7	4/3	Ground (1), Hover (1+), Naval (hydrofoil)
9	5/4	Hover (1/3 to 1/2)
10	5/5	Ground (1/2), Hover (1/4 or less)

ACCELERATION

At the beginning of each turn, the owner of each vehicle chooses its speed for the turn. All players determine their new speeds, record them

either in the Speed box on their record sheets or on a piece of scratch paper, and then reveal them simultaneously. Vehicles may only accelerate or brake by 1 or 2 increments of speed per turn. The acceleration indicates how many speed levels the vehicle may increase in one turn, and the braking ability is the number of speed levels that may be reduced in one turn.

For some vehicles the ability to accelerate by a certain amount isn't guaranteed. Each time they attempt to accelerate they must roll 1d6 to determine if they can successfully accelerate by the ACC amount each turn. They must roll this EACH item they attempt to accelerate.

Acceleration	Allows Speed Changes of ACC
ACC	
2.5 mph	1 in 6 chance ACC 1 – rolled each attempted acceleration
5 mph	3 in 6 chance ACC 1 – rolled each attempted acceleration
10 mph	5 in 6 chance ACC 1 – rolled each attempted acceleration
15 mph	ACC 1 – no roll required
20 mph	3 in 6 chance ACC 2 – rolled each attempted acceleration
25 mph	5 in 6 chance ACC 2 – rolled each attempted acceleration
30+ mph	ACC 2 – no roll required

FLOOR IT

Any vehicle may attempt additional acceleration any turn as follows:

1d6	Extra Acceleration
1-3	Add a 5-1 maneuver to the end of normal movement
4-5	The vehicle moves normally
6	The vehicle moves normally, but then 'stalls'. A stalled vehicle may not move unless it rolls a 6 just prior to the first movement phase. The usually results in simply the loss of a 5-second turn. In the case of flight-capable vehicles it may mean the vehicle starts falling. The vehicle may attempt to get out of a stall (by rolling a 1 in 6 chance) each turn.

ADDING ARMOR (A) AND STRUCTURE POINTS (SP)

Two of the most commonly added components are Armor (A) and Structure Points (SP – also known as Hull Points). Neither of these are required on any vehicles. They are mostly available to extremely large vehicles such as spacecraft and very heavy tanks.

For all practical purposes, Armor and Structure Points are interchangeable and are only considered separately for the purposes of non-combat structures such as office buildings – which don't have "armor" but have the equivalent of Armor in Structure Points before the office building is considered destroyed.

Keep in mind that **most** vehicles **do not** have either Armor or Structure Points. The added weight and price don't justify the purchase for most non-combat vehicles. These are simply 'damage-sinks' for combat-capable vehicles and without them then most crash or weapon damage will be applied directly to a vehicle's internal components.

There is no practical limit on either armor or structure points but the following ranges are most appropriate.

Armor (A) - unarmored or slightly armored vehicles have Armor ratings roughly equal to their Size rating to represent their structural strength. Lightly armored vehicles have Armor equal to roughly twice their Size.

Moderately armored vehicles have armor equal to about two and a half times their Size. Heavily armored vehicles have Armor equal to roughly three times their Size. Anything with an Armor rating greater than three times its Size is either incredibly slow or completely unrealistic.

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

Structure Points (SP) - Generally a vehicle with SP has as many SP units as it has Size. A hull of Size 25, for example, would be unlikely to have 5 SP units.

ADDING WEAPON SYSTEMS

Once a hull has been built using the above, weapons may be added.

Weapons may be placed in any combination in a hull. The total "Capacity" of all weapons in a hull can not exceed the Size of that hull. For comparison purposes, a CAP is approximately 20 Car Wars 'Spaces'.

"Cost" is used during calculation of a vehicle's BP value.

Weapon (ab by)	ATT	RNG	DEF	CAP	BP	Notes
Antipersonnel Batteries (AP)	1	1	1/2	1		Only against infantry
Beams (B)	1	15	0	1	1	1 PD/1 ATT
Cannons (C)	1	15	0	1	1/3	1 PD to fire, not w/B or S

Hellbomb (HB)	-	-	0	1	3	Destroys CP/SB
Main Battery (MB)	4	3	4	3	8	
Missile (M)	2	15	0	1	1/3	Internal Missile
Missile – Gas (GM)	2	15	0	1	1/3	Internal Missile
Missile Rack (T)	-	-	4	2	6	Fires Internal Missiles.
Missile – External (ME)	6	5	3	1	1	One-shot weapon
Missile – Internal (MI)	6	5	(4)	½	½	See Missile Rack
Secondary Battery (2B)	3	2	3	2	4	
Shells (SH)	1	15	0	1/6	1/6	Fired by Cannons
Tertiary Battery (3B)	3	2	2	2	3	
Tubes (T)	-	-	0	1	1	1 PD to fire

Point Defense Beam (PDB)	1	15	0	1	1.33	1 PD/1 ATT
Rocket Launchers						- Cyberwalkers
Breath Weapon						- Godzilla
Trample/Tail Attack						- Godzilla
Acid						- Godzilla
Entanglement						- Godzilla
Hallucinogen						- Godzilla
Electrical Blast						- Godzilla
Breath Weapon						- Godzilla
Regeneration (Ghidira/Gojira)						- Godzilla
Energy Consumption						- Godzilla
Bombs						- Airstrike
Afterburner						- Airstrike
Electronic Warfare						- Ogre Ninja

ADDING ACCESSORIES

Once a hull has been built using the above, Accessories may be added.

Accessories may be placed in any combination in a hull. The total “Capacity” of all Accessories in a hull can not exceed the Size of that hull.

“Cost” is used during calculation of a vehicle's BP value.

You may buy the same option more than once, unless otherwise indicated. For example, a ship may have more than one laboratory, 16 hexes of cargo room (two options), or a space computer. In general, combat options improve in linear progression, on a straight one-for-one basis (e.g., buying give "+3 Armor" options gives +15 DEF), while room and equipment options usually increase geometrically (each additional option gets you twice as much as before).

For the discriminating and wealthy voyager, many manufacturers offer luxury vehicle options (3 BP). Each luxury option counts as three common options. Here are some of the more popular ones.

Weapon (abv)	CAP	BP	Cost	Wt (lb.)	Notes
Ablative Armor (A)	0	1	\$1,500	150	\$500/T A, 50 lb./A
Acceleration Protection	¼	0	\$93,750	250	Per Size
Acrobatic Handling	¼	1	-	-	+1 DEF
Advanced Controls					
Advanced Neural Net					
<u>Airdroppable</u>					
Airlift Ready					
Airlift Winch					
Airlock	¼	-	-	-	Free for spaceships
Ammo Storage					
Ammo/Fuel Containment System					
<u>Amphibious</u>					
Anti-missile System					
Antipersonnel Batteries (AP)					
Anti-personnel Charges					
Aquatic Sensors					
Armor					
<u>Armor (A)</u>					
Artificial Gravity Generator					
Artificial Intelligence					
Audio System					
Automation					
Autopilot					
Backup Communications					

Backup Fire Control
Backup Life Support
Backup Sensors
Backup Systems
Battle Arm
<u>Beams (B)</u>
Bio-energy
Camo Netting
Cannons (C)
Cargo Bay
Cargo Room
<u>Catapult</u>
Chaff/Flare Dispenser
Climbing Apparatus
Cloaking Device
Combiner
Computer
<u>Computer</u>
Computer - Improved
Computer Navigational Telescope
Control Room
Counter-battery Sensors
Crew Accommodations
<u>Decoy System</u>
Dimensional Jumping
Dimensional Mass
Dimensional Storage
Diving Wings
Easy To Modify
<u>Ejection System</u>
Electronic Counter Counter Measures
Electronic Countermeasures (E)
Emergency Medical
Emergency Power Surges
Exhaust Filters
<u>Exotic Weaponry</u>
Faster Impulse Engines
Fire Resistant
Force Field
Fuel Efficient
Geological Sensor
<u>Glider</u>
Grapple Launchers
Gun Ports
Haywire Resistant
Heat Resistant Armor
Hellbomb (HB)
High Capacity Computer
High Towing Capacity
Holds (H)
Holofield
Hostile Environment Protection
Hostile Environment Protection: All
<u>Hostile Environment Protection: Desert</u>
Hostile Environment Protection: Extreme Cold
Hostile Environment Protection: Extreme Heat
Hostile Environment Protection: High Gravity
Hostile Environment Protection: High Pressure
Hostile Environment Protection: Radiation
<u>Hostile Environment Protection: Underwater</u>
Hostile Environment Protection: Vacuum
Hull
Hull - Spaceship
Hull - Stronger
Hull Damage Points (Hull)
<u>Improved Off-road Ability</u>
Improved Rear Defense
Impulse Engines
Jump Jets
Laboratories
Landing Gear

Large Doors
Life Support
Life Support
Life Support - Improved
Lighter-than-air
Loudspeakers
Low Profile
Main Battery (Mb)
Manipulator Arm
Micro-labs
Mine Detectors
Minelaying Equipment
Minesweeping Equipment
Mining Equipment
Missile - External (Msl)
Missile - Gas (Gm)
Missile - Internal (Msl)
Missile Rack (MR)
Missiles (M)
No Fuel Required
NOE Flyer
Passenger Accommodations
Passenger Seating
Pintle Mount
Point-defense Beams (PDB)
Power/Drive (Pd)
Private System
Radio
Ram Plate
Reactive Armor
Reduced G-effect
Reentry System
Refueling Equipment
Reinforced Armor
Reinforced Chassis
Reinforced Crew Compartment
Reinforced Location Armor
Repair Bays (R)
Robot Doctor
Rooms
Rooms: Bathroom
Rooms: Cargo
Rooms: Concealed Cargo Room
Rooms: Danger Room
Rooms: Laboratory
Rooms: Lounge
Rooms: Quarters
Rooms: Repair Room
Rooms: Sickbay
Rooms: Swimming Pool
Rooms: Swimming Pool - Large
Rugged Movement Systems
Satellite Uplink
Scoring Sensors
Screens (S)
Searchlight
Secondary Battery (2b)
Security Systems
Security Systems - Advanced
Sensors
Shells (SH)
Shield
Shielded Weapons
Shuttlecraft
Sick Bay
Sleep-teacher
Smoke Launchers
Sniper Systems
Spacesuit
Spacesuit - Improved
Sporting Weapons

Stabilizer Mount
Stealth
Stealth Unit (Su)
Stratospheric Flight
Streamlining
Structure Points (Sp)
Suspended Animation Chamber
Systemship Racks (Sr)
Target Designator
Teleporter
Tool Arm
Tractor Beams
Transformable
Trideo Link-up
Tubes (T)
Urban Friendly
Vehicle Bay
Warp Drive - "Souped Up"
Warp Drive - Better
Warp Engine
Warp Generator (WG)
Warspace Radio
Warspace Radio - Portable
Weapon Link

WEAPON AND ACCESSORIES DESCRIPTIONS

ABLATIVE ARMOR (A, Cap 0, 1 BP) One (or more) facing of the vehicle is covered with a special armor plating which shatters under kinetic stress or vaporizes when hit. This absorbs incoming damage, but the ablative armor must invariably be replaced after each battle. The maximum amount of ablative armor that may be carried is equal to 3 Armor points per 1 BP spent. Each defensive arc (Front, Sides, Top, Bottom and Rear) must be protected separately.

When the vehicle is hit, the current rating is added to the DEF rating of the vehicle. Ablative armor automatically loses 1 Armor point from its rating per 1 point of damage every time it is hit. This is in addition to the normal damage of the vehicle, if applicable. The Ablative Armor loses points on every hit of damage, whether the attack inflicts a damage result to the vehicle or not.

For each 1 point of armor is considered 1 cubic foot of material (usually BPC which means that each point is HS 7, ST 150).

Armor is the **ONLY** required vehicle characteristic (and for purposes of clarity is often referred to in terms of the structure it is protecting. Every vehicle must have at least 1 point of Armor per Size. On large cybertanks, armor is often referred to as "tread" units. On large mecha's its is referred to as "leg" units. On stationary buildings it is referred to as "structural points". When using the vehicle rules to build large city-size monsters they are even referred to as "body points".

Armor is ablative hull reinforcement. 1 BP builds (2 + (tech level-10)) points of Armor. One point of Armor will absorb one point of damage. Armor is repaired at a cost of 1 BP per 2 points of Armor, regardless of tech level. It protects equally against physical and energy attacks. Armor acts as ST, covers the whole ship, and costs no P/D. Armor (A) is ablative hull reinforcement. 1 BP builds 3 points of Armor. One point of Armor will absorb one point of ATT damage.

Tech Level (TL)	Armor (A)	Materials Available
12	3/1	BPC
11	2/1	BPC, Chobham
10	1/1	BPC, Chobham, Titanium
9	½/1	Chobham, Titanium, Tungsten
8	1/3rd/1	Titanium, Tungsten, Steel
7	¼/1	Tungsten, Steel, Iron
6	1/6th/1	Steel, Iron, Aluminum
5	1/8th/1	Iron, Aluminum, Bronze

ACCELERATION PROTECTION Aircraft and spacecraft with this Accessory have been modified to reduce the strain of acceleration on its crew, either through special cockpits, G-seats or advanced flight suits. Crew have a +1 ST bonus whenever they have to make a GLOC roll due to sharp turns or other effects of acceleration. **Only Flying and Space vehicles can take this Accessory.**

ACROBATIC HANDLING The maneuvering system of battlefield Mecha's are designed with overall motion in mind. War machines must be able to move quickly and efficiently over varying terrain, but elaborate jumps are beyond the needs of the military. All these factors are important in duels as well, but there is an added need for close-combat maneuverability. Being able to jump and flip the Mecha through tight obstacle courses and to avoid multiple tackling opponents is not only useful but extremely crowd pleasing.

The Rating of Acrobatic Handling is added to the Mecha's Maneuver score for close combat attacks and defenses when defending against point-blank attacks. The Perk gives no advantage for any attack made from Short Range or further. Acrobatic Handling also modifies any rolls made for jumps, flips or kicks.

No Mecha may take a Rating in Acrobatic Handling higher than one above their Maneuver Rating. Mecha with negative modifier Ratings and vehicles without the Walker movement type may not take Acrobatic Handling.

ADVANCED CONTROLS The vehicle has a very advanced, user-friendly control interface. The great ease of its use allows the vehicle to have one extra action each combat round, regardless of the number of crewmembers aboard. Advanced Controls do not have a regular Accessory cost - rather, they add one to the number of actions supplied by the crew for calculation purposes.

ADVANCED NEURAL NET Advanced neural nets are the "smart" computers that form the core of the newest generation of military vehicles. They were developed in part with technology recovered from destroyed or abandoned Earth vehicles and spaceships. Advanced neural nets are harder to manufacture and more expensive than regular NNets, but they give incredible response time to all of the vehicle's on-board electronic systems.

Advanced neural nets are highly responsive. If the crew spends one action at the beginning of the turn, it can add a +1 modifier to the vehicle's Maneuver Rating for the entire combat turn. Advanced neural nets also automatically get the learning ability (see "Neural Network, page 11, for more detail).

AIRDROPPABLE This Accessory is added to vehicles that will be parachuted in by airborne units. The vehicle is equipped with a parachute or an equivalent device that allows it to be dropped from high altitude onto a battlefield. The suspension and drive train have been specifically designed to absorb the shock of landing without suffering damage. See *Airdropping*, page 76. For example, the vehicle can be built with high-impact actuators in its suspensions along with reinforced hardpoints along its upper hull to attach to a parachute pack.

The Airdroppable Perk should be added to vehicles that will be parachuted in with airborne units. Note that the maximum mass of an Airdroppable unit is 25 tons, as listed in the Tactical Air Support Sourcebook (page 94). Machines with the Airdroppable Perk tend to be lightly armored vehicles or advanced Mecha models. This Perk has limited tactical applications, unless the scenario specifically allows this type of deployment, but it could lead to some interesting (and potentially spectacular) Roleplaying and tactical campaign opportunities.

AIRLIFT READY The vehicle is equipped with quick-connect hardpoints and is reinforced in a manner that makes it easy to airlift by VTOLs. Airlifting can be used to deploy a vehicle rapidly or to allow it to cross major obstacles. An airlift-ready vehicle can be prepared for take-off in half the time normally required to do so. See *Airlifting*, page 76.

AIRLIFT WINCH The aircraft is equipped with a rugged system which enables it to airlift troops and/or cargo without having to land. The Accessory's rating gives the maximum number of troops that can be airlifted in a single Air War round, or the maximum Size of any airlifted cargo. The Accessory rating cannot be higher than half the Size of the aircraft. The vehicle has to be stationary and at altitude level 0. Only VTOL Flying vehicles can take this Accessory.

AIRLOCK (Cap ¼, 0 BP) One airlock with a locking door. These are free with every spaceship.

AMMO/FUEL CONTAINMENT SYSTEM The vehicle's ammunition and fuel bays are reinforced and equipped with blast-control panels. The system completely absorbs the first hit when an 'Ammo/Fuel Hit' result is obtained on the Fire Control Damage Table - there is no further damage beyond the lost Armor points. The Accessory is then destroyed. The Accessory's effect can be restored by normal repair if a technician works on the vehicle after combat.

AMMO STORAGE The vehicle is equipped to store some or all of its spare ammunition clips in an armored compartment to protect them against damage. If there is no Manipulator Arm or ammo-reloading Tool Arm mounted on the vehicle, the crew must reload the weapon manually, at a rate of one shot per action. The clips are not counted as an AUX systems and can only be destroyed when actually in the weapon. The cost is one point per ten TV points of ammunition stored, regardless of how they are divided into clips.

AMPHIBIOUS The vehicle is adapted for occasional water travel such as river crossings and aquatic assaults. The vehicle is amphibious, but is not intended for extended water activity. In the tactical game, the vehicle may travel across Water hexes, paying MP according to its normal movement type (not as a Naval vessel). This Accessory does not grant the Submarine movement. The Amphibious Accessory is only available to Walker and Ground vehicles.

ANTI-MISSILE SYSTEM Anti-missile systems (AMS) are designed to detect and destroy missiles before impact. They usually take the form of rapid-fire, small-caliber machine-guns, though small counter-missiles or shotgun-like devices are also used. All these missiles are mounted in small independent turrets on top of the hull to ensure both a rapid response time and complete coverage of the surrounding area. Anti-missile systems are most often used on slow and ponderous vehicles such as heavy tanks and landships, because their weight and clumsiness prevents them from dodging.

In game terms, each functional anti-missile system grants the vehicle an additional special defense roll versus projectiles such as missiles and rockets. Anti-missile systems do not use up actions and roll versus every incoming missile or missile cluster (burst attacks). If not currently in active mode, they can also be fired as normal weapons (x1 Damage Multiplier, ROF 3 with a Base Range of 1) at the cost of one action.

The anti-missile system has a Skill level of two, plus its Rating. It can attack any type of mortar shell, rocket, or missile, but not bazooka projectiles. If the result of the anti-missile system is greater than the attacker's roll, the anti-missile system is greater than the attacker's roll, the anti-missile system shoots down the missile. The AMS completely destroys the missile when successfully used versus a single shot attack. When used to defend versus a missile cluster (ROF attack), the same technique is used, but each point of the MoS reduces the incoming cluster's ROF bonus by one. If the ROF bonus drops to zero or below zero, all of the incoming missiles have been effectively destroyed.

The amount of shots spent each time the system is fired is equal to five minus the MoS, with a minimum ammunition cost of 1. The maximum number of units of ammo that can be carried is equal to ten times the vehicle's final Size. There is no limit on the number of AMS carried per vehicle, but no AMS may have a Rating higher than 3.

ANTI-PERSONNEL CHARGES Anti-Personnel (AP) charges are directional fragmentation mines mounted on the hull of a vehicle as a deterrent to close assault by infantry units. When an infantry squad

closes to within 25 meters of the vehicle, a small proximity sensor detonates one or more charges in the direction of the unit, slicing through their ranks and showering them with deadly shrapnel. Fortunately for infantrymen, the system is not fool-proof and sometimes either fails to function or does so too late, allowing the attackers to get to cover before the blast hits.

AP charges can be turned on or off at the cost of one action. They are either all on or all off - it is assumed they are "on" at the start of a battle. They have a Damage Multiplier of 3 and roll two dice for their attack roll, adding their Rating to the dice roll. No AP system may have a Rating lower than one (1) or higher than three (3).

Each firing of the system consumes one die's worth of charges. The range of the AP charges is 0 (Point Blank only - the infantry must be the same hex as the vehicle) and they have a "T" firing arc. Firing AP charges does not use up actions - the system automatically attacks all infantry units (friend or foe) in the hex once per turn until the infantry unit is destroyed, leaves the hex the system runs out of charge or is turned off.

The hull-mounted position of the charges makes them vulnerable to enemy fire. Anti-personnel charges count as auxiliary systems, but damage is applied differently for them. On Light damage result, two dice's worth of charges are destroyed. On Heavy damage result, all charges are detonated and lost. It is not possible to armor or otherwise protect the AP charges, as this would reduce their performances below acceptable level.

ANTIPERSONNEL BATTERIES (AP) Antipersonnel weapons have an unlimited supply of ammunition. The AP batteries are only effective against thin-skinned targets, such as unarmored command posts, most civilian buildings, transport vehicles...and, of course, infantry.

Vehicles are not the only units to have AP batteries. Some permanent emplacements, and a few large armor units, have an AP capacity.

A unit which mounts multiple AP batteries may not shoot them off, one at a time, for a long series of attacks against the same target. Each unit only gets one AP attack per turn against any given target, though it can combine as many AP guns as are available into that attack.

AQUATIC SENSORS The vehicle is equipped with underwater sensors such as sonar, magnetic anomaly detectors and specialized cameras. A vehicle may be equipped with aquatic sensors in addition to its normal sensors, or it may be equipped exclusively with aquatic sensors. The latter use the sensor range that would have been used by their 'normal sensors.' Vehicles with both must specify the range of both types of sensors.

In tactical terms, the vehicle ignores Water terrain Obscurement while in water itself. Some vehicles have aquatic sensors that do not need to be immersed in water to function. They must be within a minimum distance (often under a kilometer) from the body of water they wish to scan, however. If aquatic sensors can be used out of water to detect targets in water, an additional +1 is added to the cost per 100 m (2 tactical hexes) of distance this ability extends to.

ARTIFICIAL GRAVITY GENERATOR maintains normal gravity in the living quarters, whether or not the impulsive engines are on. This makes it possible to use any number of Gs of thrust without harming the occupants (10 pt.).

ARTIFICIAL INTELLIGENCE The vehicle is capable of independent action and decision making. The Perk counts as one crewmember. No live crew need be added. Additional "crewmembers" on an AI-controlled vehicle are often added using the Automation Perk.

The Rating of the AI is used as the Skill level of the "crew." AI are not true intelligence nets: they lack personality and flexibility. They also lack the rapid learning ability of more advanced neural nets, but are better at independent action because of their extensive data banks and expert systems.

Artificial Intelligence is not affected by "Crew" hits; any such damage is ignored, though Armor is lost as usual.

AUDIO SYSTEM The vehicle has an audio system, similar in function to a 21st century car stereo. The audio system is fully digital and can serve as a radio receiver or play back standard datadisks. It also includes large speakers capable of high decibel output. This system has no tactical game effect, but offers Roleplaying opportunities.

AUTOMATION This Perk substitutes mechanical and electronic systems for real crew members. They can be anything from an autoloader for the main gun or additional computers for the sensor system - all that matters is the extra "manpower" they supply.

The Rating of the system is equal to the number of crew members the Perk simulates. The vehicle must have at least one live crew member or the Artificial Intelligence Perk, except if it is a remotely-controlled vehicles (see page 13).

AUTOPILOT Autopilots are simple devices that can take over the piloting tasks. They can keep the vehicle going in a straight line, avoid large obstacles, and steer the vehicle towards a specified location. In tactical terms, an Autopilot is very limited. It can be used to keep a vehicle moving in a straight line or perform 60° (one hex-facing) turns. Autopilots are not affected by Crew hits, cannot fire any weapons and dodge attacks as a level 1 pilot. An Autopilot is required if the vehicle is to be remote controlled or computer operated.

BACKUP COMMUNICATIONS The vehicle may ignore one Communications damage effect of the Auxiliary System Hit on the Systems Damage Table. All non-communication auxiliary systems take normal damage effects. The Perk can be restored by a normal repair if a technician works on the vehicle after combat.

BACKUP FIRE CONTROL The vehicle may ignore one "Fire Control Destroyed" result on the Fire Control Damage Table. The Perk's effect can be restored by a normal repair if a technician works on the vehicle after combat.

BACKUP LIFE SUPPORT The vehicle has backup life support systems that allow the vehicle to continue providing life support functions long after the primary system has been disabled. In game terms, the vehicle continues to have life support even if the vehicle has all of its auxiliary systems destroyed. The vehicle must already have a life support system to take this Accessory.

BACKUP SENSORS The vehicle may ignore one Sensor damage effects on the Auxiliary System Hit of the Systems Damage Table. All non-sensor auxiliary systems take normal damage effects. The Perk's effects can be restored by a normal repair if a technician works on the vehicle after combat.

BACKUP SYSTEMS This is a package deal which contains one of each of the followings: Backup Communications, Backup Fire Control, Backup Life Support and Backup Sensor. The usual rules for these apply in full.

BATTLE ARM The vehicle has a rudimentary arm without manipulator. While battle arms are merely flexible projections and not very nimble, they can lift objects - provided these have been attached to the arm - whose Size score is equal to or lower than their rating. No matter the rating of a battle arm, a vehicle cannot lift an item whose Size is greater than twice its own. If a vehicle has multiple arms, half the weight lifting capacity of the weaker arms are added to the full rating of the strongest arm to determine the total lifting strength.

Battle arms can be designed to punch opponents: they end in a reinforced battering ram or other brawling weapon. This attack type has a Damage Multiplier equal to the rating of the arm. This ability modifies the Offensive Score of the vehicle (see Offensive Score, page 104)

BEAMS (B) represent the ability of a ship to project a beam of destructive energy at a target. Each ship may have only one Beam projector. The strength of the projector will vary according to the number of Build Points spent on it. The number of BP spent on the beam is the maximum strength at which that ship's beam may be powered during combat.

BIO-ENERGY Although most machines are equipped with a power plant, a few weird ones might feature an energy converter that uses the pilot's (or crewmen's) own psychic or life energy for power. Often (but not always), the more emotional the pilot, the more powerful the machine! This unusual perk allows for a great reduction in the cost and size of a machine (since it does not require a large power plant). This benefit is more than offset by the sub-standard performance of the machine and the extremely limited deployment range of such craft.

When this option is chosen, the pilot's ST can be directly converted to PD at a rate of 1 = 1. This Perk is a TL 12 Perk only.

CAMO NETTING The vehicle is covered with a heat-absorbent tarp which has a net attached to it. Leaves and other camouflage material can be attached to it, while heat is absorbed by the tarp. This gives a +1 to Concealment when in Woodland or Jungle hexes. The camouflage tarp is custom designed for each vehicle type, ensuring that it covers most of the hull and blurs the overall silhouette. Most tarps are made to be easily stored and installed. This Perk is only effective when the vehicle is stationary.

CANNONS (C) are used by a ship to launch Shells. Each Cannon may fire either one, two or three Shells per combat round. 1 PD is required to power a Cannon for one combat round. Each Cannon costs 1 BP to build. Cannons are treated as Beams as far as combat goes, i.e. ship's drive setting is used on CRT, but they may not be used with Beams or Screens. May be used with Missiles.

CARGO ROOM One hex of cargo room (8 cubic meters)

CARGO BAY A cargo bay is a large hollow place within the vehicle to put miscellaneous material. Cargo bays can be described for unusual cargo: some cargo bays are meant to carry only liquids, like the tank of a fuel truck. Others are compressed gas containers, like a tank of fire fighting foam. Of course, cargo bays can always be simple hollows intended to store boxes of goods. Although specialized cargo bays often cost more to design and build, their inherent lack of flexibility cancels this - thus no extra TV points are charged for them.

Cargo bays are rated in terms of their volume in cubic meters. The intended type of content of each cargo bay must be specified at the time of construction: solid, liquid or gaseous. Cargo bays are enclosed within the vehicle. Open-topped bays are also possible, but material carried in such a bay is counted as an AUX system for damage location purposes.

It is important to note that the cargo space bought represents only the actual space dedicated inside or on the hull of the vehicle, not an increase in the power of the engine. Thus, the cargo's weight counts as 'towed' material for game purposes. Cargo bays have a minimum dimension of one meter, square or cubic. Vehicles are assumed to occupy a volume roughly equal to $(Size/2 + 1)$, rounded up. This is doubled to include some servicing and access space around it, or multiplied by ten to get full maintenance and service capability (including gantry, ample spare parts and fuel).

Vehicle Storage

Vehicle Volume	Vehicle Bay
x1	Tightly packed, crate-style storage
x2	The vehicle can be moved, minimal repairs may be done (-2 to Tech rolls)
X5	Moderate repair facilities (-1 to Tech rolls), limited resupply stores
X10	Full repair facilities, moderate resupply stores and fuel
X20	Full repair facilities, extensive resupply stores and fuel

CATAPULT A catapult is a powerful system designed to give a high initial velocity to an object leaving the vehicle, most often a carried aircraft or exo-armor. The catapult gives an initial acceleration equal to $(rating \times 150)/mass$ in tons of the catapulted object, in meters/second². This applies directly for spacecraft; for aircraft and other vehicles, refer to *Flying with Thrusters*, page 148 of the rulebook, to convert this into speed.

CHAFF/FLARE DISPENSER Chaff and Flare dispensers are used to confuse and defeat the radar and infrared guidance systems of incoming missiles. In game terms, use of a Chaff/Flare Dispenser grants the aircraft a defense bonus versus missile and guided weapons. The dispenser's Rating is added to the pilot's defense roll. If the result of the vehicle's modified defense roll is greater than the attacker's roll, the countermeasures have successfully misled the missile(s) away from the target vehicle.

Use of a Chaff/Flare Dispenser does not cost an action in the Air War scale, but does cost one action per use in the Dogfighting scale. There is no limit, other than the dispenser's ammo load, to the number of chaffs or

flares that can be used in one round, but only one shot is expended per defense roll.

CLIMBING APPARATUS The Climbing Apparatus is a set of special footplate spikes, ropes and claws used by humanoid vehicles for climbing. Since the claws can hold the unit securely against the cliff face, weapon fire during climbing is now possible, albeit at a -2 modifier. The Climbing Apparatus also reduces the climbing Piloting test's Threshold by one. The climbing equipment is much too clumsy and cannot be used as a weapon.

A vehicle must have both the Walker movement mode and at least two Manipulator Arms capable of lifting it to make use of this Perk.

CLOAKING DEVICE: provides partial invisibility to normal vision, infrared, ultraviolet, and radar for the whole ship. At full power it draws 5 Gs of power and gives the ship +5 DCV, because your ship appears hazy and indistinct to other ships' sensors. The cloaking device may be run at partial power, giving +1 DCV per G. This device must be shut off one turn (12 seconds) before entering warp space, because the cloaking field interferes with the warp field (23 pt.)

COMBINER Combiners are vehicles that are fully operable on their own but also possess the ability to connect - "combine" - with other specially designed machines to form a greater and usually more powerful vehicle. The component vehicles don't just dock together, either, they literally merge into the new unit: each sub-vehicle is equipped with additional systems that allows it to act as part of the whole, effectively allowing the greater vehicle to be more than the sum of its parts. To combine, all vehicles must end their movement in the same hex (if in space, their velocity should be within two points) and spend one action each. The connection is instantaneous (though special effects, panning camera shots and battle cries may make it seem like longer) and the Combiner is ready to act next turn.

The Combiner and the combined machines are designed separately. They need not have the same form, armament or additional systems such as Perks and Flaws: for example, two minitanks could combine to become a large hover vehicle. The weight of the combined machine should be equal to the total weight of the vehicles that constitute its body, however, unless the campaign is firmly set in the fantasy genre. Crew must be accounted for in both combiners and combined forms, that is, any Combiner crew that is not used in the combined machine must be given passenger seating or be dropped off before combining.

Each Combiner vehicle must be assigned to one of the five following locations on the larger combined unit: Fire Control, Structure, Crew, Movement and Auxiliary Systems. Each location must be assigned at least one Combiner (Combiner vehicles can be part of more than one location). Whenever one of these locations take Light damage, one point of Armor is removed from the vehicle assigned to that section (in case of Heavy damage, two points). If more than one Combiner vehicle is available in a given location, the damage is assigned randomly. Roll a die: even, attacker chooses, odd, defender chooses. If the combined vehicle receives a Critical result, it "decombines" into a constituent vehicles, all of which take an immediate Heavy damage result. Until repaired, the Combiner vehicles cannot recombine.

The BP Value and cost are equal to the BP cost of the combined machine or the total BP cost of all component machines, whichever is greater.

COMPUTER A small computer, with warp drive programs, technical manuals, and enough extra memory for 10 books' worth of information (2 pt.)

COMPUTER The vehicle has a built-in, general use computer in addition to the computers used to control the vehicle. While it is primarily a Roleplaying tool, players can use the computer in tactical combat, using Modules such as Electronic Warfare, Fire Control and Pilot to assist the crew. The Perk's rating is the Processing Power of the computer. This is squared and multiplied by the Attribute Multiplier (see table) to get the cost. It should be rounded to the nearest whole number. Hardwired computers are designed for a specific module and module level, and their programming cannot be changed. As a result, they are cheaper.

Instead of being equipped with an ordinary computer, the vehicle may have a sentient Artificial Intelligence: it is thus capable of independent action and decision making. Each AI computer counts as a separate crew and gets its own actions and penalties. No live crew need be added. Neither type of computer is affected by "Crew" hits. See *Computers*, page 136, for the complete rules and descriptions of Modules.

COMPUTER - IMPROVED A more powerful computer, with a universal translator program, an Autopilot program, and room for 1000 books' worth of information as well as the normal navigational routines. The Autopilot has 11- piloting skill and a DCV of 2 when performing evasive maneuvers (8 pt.)

COMPUTER NAVIGATIONAL TELESCOPE A simple navigational telescope, connected to the computer. It can also be used for detecting spaceships in combat, but it is not very sensitive, so telescope-aided combat is at -3 OCV. (1 pt.)

CONTROL ROOM A control room with one acceleration couch (1 pt)

COUNTER-BATTERY SENSORS A Counter-Battery Sensor (CBS for short) is a set of specialized radar and sensors designed to locate an enemy artillery unit based on the trajectory and signature of its fire missions. When an indirect fire attack is incoming, an attempt can be made by any CBS-equipped unit within half sensor range of the target hex to locate the attack's origin, allowing effective counter-fire. Activating the CBS costs one action. The operator "attacks" the enemy unit using Electronic Warfare as the skill and the CBS as the weapon. The opponent must reveal in which range bad the firing unit is located. The CBS's Base Range is equal to its rating: it has +0 Accuracy and does no damage.

A successful roll locates the last known firing position of the firing unit. Obviously, if the enemy battery moved after firing, the information is much less valuable. A failure does not yield any information. On a fumble, the operator gets a phantom echo - any counterattack automatically deviates by a number of hexes equal to the results of three dice, added together.

CREW ACCOMMODATIONS The vehicle has proper sleeping quarters for its crew. Two quality levels of crew accommodations are available. Military grade crew accommodations are spartan in design and provide little privacy or comfort. Luxury accommodations, on the other hand, include private sleeping quarters and personal hygienic facilities. A vehicle with numerous crew accommodations of either type also includes a

few common rooms such as galleys and lounges. Luxury common rooms are obviously more numerous and more posh.

DECOY SYSTEM A Decoy system allows a vehicle to project phantom images of itself or another object by using inflatable decoys, holographic or electronic signal imaging technologies. In tactical game terms, the Decoy system can create as many false images as its Rating. The attacker must make a Notice Skill check (if playing a purely tactical game, replace this by an Electronic Warfare Skill test) against the Rating with a modifier of -3 in order to hit the correct target. Both Sensor and active ECCM system add their Rating to this roll.

Visual decoys only affect visual detection and are automatically identified as decoys by Active Sensor rolls. It is also possible to create false sensor targets with no visual images – these are automatically identified as phantom echoes once in visual range, but have their rating boosted by the rating of active friendly ECM. More advanced decoys can imitate both the visual aspects and the sensor signature of the vehicle they emulate. Guided, Smart and Sensor-homing weapons are just as likely to go for a sensor decoy, though they won't be fooled by a visual one.

DIMENSIONAL JUMPING Dimensional Jumping is very similar to Faster-Than-Light flight, game-wise, but instead of going to other star systems, the vehicle can hop across parallel dimensions (or across time). Practically any vehicle can be equipped with Dimensional Jump drive, provided the scientific background of your alternate campaign allows it. The BP value of the vehicle is modified solely according to the versatility of the drive, regardless of the vehicle's physical size. For simplicity's sake, only a certain set of parameters are listed. If the vehicle's Stats fall between two values, use the closest one, rounding up. If the system represents a time-traveling device, use the # of Accessible Dimensions below as the possible range in years. The Activation Delay is the time required for the system's activation to occur once the controls are set: during that time, the vehicle can do nothing. The total cost (both in BP and money) is the vehicle's final BP and cost times the Dimensional Multiplier(s) below.

Dimensional Multipliers

Accessible/Range	Multiplier	Activation Delay	Multiplier
1	x1	1 turn	x2
10	x2	30 seconds (6 turns)	x1
100	x4	1 minute	x0.9
1,000	x8	10 minutes	x0.75
10,000	x16	1 hour	x0.5
100,000	x32	1 day	x0.2

Limitations

Limitations	Multiplier
Must be in a specific location	x0.5
Requires special fuel	x0.5
Requires rare fuel	x0.3

DIMENSIONAL MASS Some vehicles have the ability to grow or shrink in size, putting on or shedding mass without any visible means. This can be done through dimensional storage of additional mass, variable-sized molecular structure or atmospheric processing, but the game effect remains the same.

The game effect of this Perk allows a vehicle to add or subtract from its Size a maximum number of levels equal to the rating of the Perk (particularly useful when the snub-fighter grows to the size of a battleship just before impact on a ramming run). A maximum of five Size levels can be shed or gained per round, regardless of the overall capability of the vehicle. The cost of the Perk is equal to its Rating squared.

DIMENSIONAL STORAGE This often happens in animation: vehicles and Mecha suddenly pull out additional weapons or pieces of equipment that just were not there a second ago, or they sprout additional pieces that could not possibly fit within their mechanisms/structure. Although the reasoning behind it might vary, this is called Dimensional Storage: the ability to pull useful gimmicks out of nowhere. This Perk allows the vehicle access to some prepared equipment from an extra-dimensional space with a volume limited by the rating of the dimensional storage. The amount of "cargo" volume supplied is equal to the Rating squared, in cubic meters, with the cost of this Perk equal to its Rating. Vehicles that "extrude" new systems should be designed as Transformables (see page 144).

DIVING WINGS Fixed wing aircraft with this Perk have their wings in a distinctive shape which enhances its ability to pull out of a dive. Any such plane gives a +1 bonus on Piloting Skill rolls for pulling out of Dives, Stalls, or uncontrolled falls. **Only Flying vehicles can take this Perk.**

EASY TO MODIFY Easy to modify vehicles feature standardized parts and modular aspects. While this type of design is a joy to modify and often lasts longer in the field, it is generally more difficult to design. They rarely have many other innate features and are usually modified whenever any new functions are needed.

One (or more) of the vehicle's subassemblies is designed in such a manner as to be easy to repair or replace. +2 iq is added to all technical skill rolls to modify and repair this particular subassembly of the vehicle. The subassemblies covered by this Perk are: Movement, Structure, Fire Control and Auxiliary Systems.

EJECTION SYSTEM The vehicle is equipped with an ejection system to give the crew a chance to escape if the vehicle suffers an Overkill damage result (or before that, if desired). See *Ejection* (page 159 of the rulebook) for more details. This Perk also covers the various pieces of survival equipment such as life preservers and inflatable lifeboats on marine vehicles. Very few ground vehicles have ejection systems – if the crew is unable to crawl out of their vehicle, they are probably dead already.

An ejection seat is designed to get a crewmember away from the craft to avoid being caught in any explosion which might result. A parachute (in atmospheric operations) or a rescue beacon (in space) allow for a safe rescue, although with little control over which hands the person falls into. An ejection pod is a self-contained life boat for air and space vehicles which allows for a limited amount of maneuvering and for re-entry to a planet's atmosphere. Its naval equipment is the inflatable air raft.

ELECTRONIC COUNTERMEASURES (E) Electronic Counter Measures (ECM) are devices that are used to jam sensors and communication systems. ECM is especially useful to prevent forward observing and drone operations. Rules for using ECM systems can be found on page 151 of the **Jovian Chronicles** rulebook. ECM range is identical to the vehicle's Sensor range.

Electronic Counter Measures cost 1 BP per point of ECM. The vehicle can allocate PD in combat to ECM, up to the ECM rating with which the vehicle was constructed. In combat, after orders are revealed, the player using ECM allocates his ECM points among the attacking Missiles, and then adds or subtracts the difference between the defending vehicle's tech level and each Missile's tech level from the ECM points allocated to that Missile. ECM may be used in the same combat round with all other vehicle systems.

ELECTRONIC COUNTER COUNTER MEASURES Electronic Counter Counter Measures (ECCM) are devices that are used to block jamming systems and/or punch through their effects. Using ECCM to prevent jamming requires one action. Rules for using ECCM systems can be found on page 151 of the **Jovian Chronicles** rulebook. ECCM range is identical to the vehicle's Sensor range.

EMERGENCY MEDICAL This Perk includes features like instant casts for broken limbs and stimulant/pain-killer injections to prevent loss of consciousness. In tactical game terms, this Perk cancels one "Crew Stunned" result on the Systems Damage table. In role-playing terms, the vehicle will prevent the character from losing consciousness due to his injuries. In addition, the emergency medical features will prevent wound degeneration for up to one full day. Not all personnel need be equipped with the system.

EMERGENCY POWER SURGES Emergency Power Surges (EPSs) systems are a rare feature. A vehicle with this Perk can, for a short time, boost its statistics by unleashing emergency capacitors, nitro injections, etc. In game terms, the EPS system "spends" its rating points to gain a set of benefits.

This allows the vehicle to increase one of the following attributes by one for a single combat round per rating point spent: Maneuver, Top Speed, number of actions, weapon Damage multiplier or weapon Base Damage. Each attribute can be raised up by a maximum of three points (so the maximum EPS points usable during a single round is equal to 15). A vehicle could spend all of its rating points in one round for one glorious burst of power, or it could converse the points for emergencies.

It is also possible to "overburn" the EPS system, doubling the effects but damaging the vehicle. If this option is used, each EPS point counts as two, but the system affected drops by one point afterward. If actions drop below zero, the vehicle must "buy" back the penalty before applying the action. For example, a one-man vehicle eat -2 actions would have to take extra actions (and associated penalties) to act.

EPSs burn themselves out during use. Therefore, they do not regenerate their rating. EPS repairs usually require complete vehicle overhauls. EPS use must be declared during the declaration phase and does not require an action.

EXHAUST FILTERS Less destructive exhaust: does 1/2 as many dice damage (1 pt)

EXOTIC WEAPONRY: Better lasers and missile launches are available. The missile launchers come with three clips of four missiles each, and the laser draws 5 Gs power each phase it is fired. Missiles can be either 7d6 Killing or 4d6 Killing Armor/Piercing; the same launcher issued for both types of missiles. A laser's damage must be chosen at the time of purchase to be either 7d6 K or 4d6 K AP at full power. (32 pt. for 4d6 KAP, 42 pt. for 7d6 K)

FASTER IMPULSE ENGINES [Flight] +5 Gs thrust (3 pt. per G)

FIRE RESISTANT The vehicle is made of fire-resistant materials and provides adequate heat protection for the crew. In game terms, the Intensity of any flame attack against the vehicle is halved before damage is determined.

FORCE FIELD: Provides +1 DEF for every 1 G diverted from the impulse engines for this purpose. The strength of the shields may be changed each phase. (10 pt.) Each two additional Force Field options (or each additional 20 points) add 1 DEF per G - 2 DEF per G for 30 pt., 3 DEF per G for 50 pt., etc.

FUEL EFFICIENT The engine and systems of the vehicle are extremely efficient: a greater deployment range than normal is possible. As long as the vehicle remains at Combat Speed, each point of Deployment Range provides more kilometers of distance. One and a half, twice and three times the range are possible multipliers.

GEOLOGICAL SENSOR The vehicle's sensors are specially designed to perform geological surveys, such as analyzing ground chemicals or performing magnetic analysis. This has no tactical application, but it is useful in Roleplaying scenarios. Geological sensors are common features on many of the vehicles used in the Badlands.

GLIDER Aircraft with this Perk possess the abilities of a thermal glider and only lose one altitude level or MP of speed when gliding. In addition, the pilot can ride hot air currents to actually *gain* altitude levels, by making a Piloting roll versus a threshold of 5. Each point of Margin of Success allows the craft to gain one altitude level, without losing speed. This Perk can only be taken by Flying vehicles.

GRAPPLE LAUNCHERS A compressed-gas or small gun unit mounted on the vehicle's hull can fire a special grapple attached to an ultra-resistant cable. The cable is attached to a winch which can be used to drag the vehicle forward or, if the target is lighter than the vehicle, drag it toward the winch.

Grapple launchers can be designed to send their projectile up to 250 m away. It is also possible to buy a simple winch with cable, without the launcher - the range is then considered to be 1 hex for calculation purposes, although the cable can be much longer than this (up to 250 meters long - designer's choice).

Cables (and by extension, the whole system) are rated according to the maximum Size capacity they can handle. For example, a Rating 3 cable can support a weight of 1.1 ton (the maximum mass of the Size 3 category). Several cables can be used together by adding the maximum weight they can support (e.g., two Rating 3 cables could drag up to .22 tons together).

Grapple launchers have an Accuracy of -2 and a Damage Multiplier of x2 if used as a weapon. If the Margin of Success of the attack is equal to or higher than 3, the grapple is now attached to the target in addition to any damage it might have caused. It can be detached and reeled in at the cost of one action.

The cable itself can take up to its Rating in damage points before being severed. Ranged weapons, however, have a -3 penalty to hit because the cable is so small. Point-blank melee weapons have no such penalty.

GUN PORTS The vehicle is equipped with gun ports from which the crew and passengers can fire small arms while retaining the protection of the vehicle's armor. Only small arms may be fired from the gun ports, not heavy weapons. Because of the design of the gun ports, the weapon is restricted to a "Fixed" firing arc and has a -1 DX modifier to hit in addition to the vehicular movement modifiers.

HAYWIRE RESISTANT The vehicle is specially designed to shrug off massive electrical changes through isolated circuitry and grounded structure. This Perk allows the vehicle to reduce the effects of weapons with the "Haywire" characteristic. On a Light Damage result, the second damage roll is ignored. On Heavy Damage results, the second damage roll is treated as a Light Damage roll instead of a Heavy one.

HEAT RESISTANT ARMOR The vehicle's armor is designed to deflect and dissipate the intense energy delivered by weapons like shaped-charge warheads, particle beams and lasers. Although all armored vehicles have some degree of HEAT resistance built into their armor plating, many front-line combat vehicles have an extra layer of ceramic/ablative armor to help them fend off Monroe-effect warheads and energy weapon beams.

The maximum rating is equal to half the vehicle's base Armor rating (rounded down). This rating is added to the vehicle's base Armor rating when the vehicle is attacked by HEAT-based weapons. This Perk has no effect versus weapons that are not HEAT-based (this is determined during weapon design - see page 133).

Heat-based	Not Heat-based
Bazookas	Cannon
Mortars	Railgun
Rockets/Grenades	Rifles (infantry)
Missiles	Punch
Laser	Kick
Particle Beam	Ramming
Torpedo	Melee Weapons

HELLBOMB (HB) Hellbombs cost 3 BP and are fired from Tubes. They may not be used during combat against other vehicles. One Hellbomb will destroy one Command Post/Starbase completely.

HIGH CAPACITY COMPUTER The vehicle's computer system has additional processing power that is not consumed by its normal operations. In the tactical game, this has no noticeable effect.

In the Roleplaying game, this computer can be used to run various programs that are unrelated to the vehicle's normal function. For instance, a high capacity computer might keep a series of code breaking programs or maybe the financial records of a company or a laboratory.

HIGH TOWING CAPACITY The vehicle is equipped with a high torque, heavy duty power plant and transmission. Its towing capacity is doubled or tripled, depending on the option chosen). If the vehicle has the "Walker" movement type, this Perk provides heavier actuators and power systems to give more power to the lower limbs. This yields higher damage in combat from kicks and stomps - add one to the kicking Damage Multiplier for double towing capacity, and two for triple towing capacity.

HOLOFIELD The holofield allows a vehicle to blend in to its surroundings by using both limited scope holography and photoskin technology: it is the visual equivalent of the Stealth Perk. In tactical game terms, the holofield adds its Rating to the vehicle's Concealment at all time. It only affects visual detection and does not affect Active Sensor rolls.

HOSTILE ENVIRONMENT PROTECTION The vehicle is specially designed to survive undamaged for prolonged exposure to some hostile environmental conditions. Though this is mostly a Roleplaying consideration, some tactical rules require specific environmental protections in certain types of terrain and weather (see Chapter 5 for more information). This Perk is noted "HEP: <chosen environment->" on the vehicle sheet. The following options are available:

- **HEP: Desert** The vehicle can withstand extended exposure to desert conditions without needing special maintenance to avoid sand build-up. This Perk includes air filters, modified heat exchangers, and cloth coverings on delicate mechanisms.
- **HEP: Extreme Heat** The vehicle is designed to withstand exposure to scorching temperatures, often well into the hundreds of degrees Celsius, without taking severe damage. If combined with the Fire Resistance Perk, the vehicle is effectively immune to incendiary attack
- **HEP: Extreme Cold** The vehicle is designed to endure freezing cold temperatures, such as those found in Earth's arctic and Antarctic regions, without freezing up or otherwise breaking down. Heaters, special lubricants and other modifications are part of this Perk.
- **HEP: High Gravity** The vehicle is designed to withstand very high gravity environments (3 gees +) for extended periods. This does not, however, guarantee that the crew can do the same.
- **HEP: High Pressure** The vehicle is designed to endure the great pressure of locations like ocean depths and the upper layers of gas giants. A variant of this Perk (Extreme Pressure) allows the vehicle to endure even the most extreme pressures, such as those found in the deepest of ocean depths or within the atmosphere of gas giants.
- **HEP: Radiation** The vehicle is designed to withstand high radiation levels. Foamed armor, Rad-absorbing gel layers and additional shielding protects the vehicle's sensitive systems (especially the crew). The Rad protection level, in rads/hour, is equal to ten the power of the rating (e.g., a rating 3 system would give 103 or 1000 rads/hour of protection).
- **HEP: Underwater** The vehicle can withstand full submersion in water and other fluids, up to a depth equal to five times the vehicle's Armor rating in meters (multiplied by five when combined with High Pressure, multiplied by 20 with Extreme Pressure). Vehicles capable of Submarine movement automatically possess this Perk at no cost.
- **HEP: Vacuum** The vehicle is designed to withstand the lack of pressure found in vacuum environments. All hatches and access points are equipped with airlock, the hull or crew compartment is pressurized, and so on (a life support system must still be bought separately, though). This Perk does not,

however, grant a vehicle the ability to perform atmospheric re-entry (which is a separate Perk).

- **HEP: All** The vehicle is designed to withstand *anything* thrown at it. It can go over land, in space, underwater, etc. it possesses all the above abilities at no additional point cost, except Radiation and Extreme Pressure protections (which must be bought separately).

HOLDS (H) cost 1 BP per 10 BP capacity. Holds contain BPs and allow Warships to transport BPs between stars. When taking damage, 1 point of damage will destroy one 10 BP-capacity Hold AND 10 cargo BP, or fraction thereof. When taking damage on a Warship with more than one Hold, the player may choose to damage empty Holds before BP-carrying Holds. BPs may be loaded or unloaded during the Build event only. BPs may not be transferred between ships. Systems may not have Hold s.

HULL A hull which can withstand 10 Gs acceleration (one G = Earth-normal gravity), and which provides 10 BODY and 10 DEF of structural integrity (45 pt.).

HULL DAMAGE POINTS (HULL) A water-capable wooden structure hull which can withstand 10 Gs of acceleration (one G = Earth-normal gravity) and which provides 3 SP of structural integrity per 1 BP Hull costs \$1,000,000 and weighs 20,000 lb., and is generally considered a Titan Mecha Body with 200,000 lb., Max load and 200 spaces. Some hulls can be considered smaller and these are generally considered TL9.

HULL - SPACESHIP The basic Starship is as small and light as possible. It is 4 meters in diameter and 5 meters tall, and masses 5 tons. No reputable manufacturer produces a smaller ship. This size assumes futuristic impulse engines, which may use laser beams or fusion or some such: a ship using chemical rockets would be much larger. This ship has 10 BODY and 10 DEF, and is therefore dead meat for a ship-to-ship missile, which does 5D6 Killing. This ship has no weapons, but its exhaust may do damage to nearby objects.

HULL - STRONGER Stronger hull: +5 BODY and +5 Gs maximum thrust. This does not provide additional thrust, it only makes the ship strong enough to withstand 5 Gs more thrust (7 pt., or 3 pt. per 2 BODY)

IMPROVED OFF-ROAD ABILITY The vehicle is designed to handle rugged terrain even better than standard military grade ground vehicles. Ground vehicles have massive wheels or treads. However vehicles can vary how high they float off the ground and have improved hazard detection systems to avoid pitfalls and rough ground. Walkers have powerful legs and wide, high traction feet that allow them to run efficiently even when trudging over sand or through swamps.

In tactical game terms, the vehicle pays one less MP for any terrain type that requires more than one MP. For instance, a Ground vehicle with Improved Off-Road Ability would pay 3 MP instead of 4 MP when crossing Swamp hexes, but would still pay 1 MP per Clear or Sand hex. The Perk must be bought separately for each movement type.

IMPROVED REAR DEFENSE It is normal for combat vehicles to have thick front plates and weaker rear plates, since most attacks will normally come from the front. Vehicles with this Perk have a well-defended rear arc, either through superior armor design or additional sensor systems. In game terms, this reduces the defense roll penalties from Rear and Rear Flank attack by one. In other words, the Rear Flank arc of defense penalty is 0 and the Rear arc of defense penalty is -1.

IMPULSE ENGINES capable of generating 5 Gs acceleration (15 pt.) These engines have a dangerous exhaust which does 1d6 Killing angry explosion damage per G of thrust. (For this reason, the chapter spaceport berths consist of uneven, cratered bedrock.)

JUMP JETS The vehicle is equipped with short-burn jump rockets, often liquid-fuel thrusters or solid cartridge boosters bolted to its hull. These jets allow the vehicle to "leap" over a short distance, but they do not allow true flight.

The maximum distance of the jump must be specified. Jumping vehicles may clear obstacles whose elevation does not surpass one-half its jumping distance. For example, a jump-capable Mecha with a jumping distance of 300 meters (6 hexes) may clear obstacles of elevation 3 or less.

Jumping requires one action but can be used in addition to the vehicle's normal movement, either at the beginning or the end of the normal move (not that this takes precedence over previous descriptions of the Perk). A vehicle may jump only in a straight line. Jumping occurs during the vehicle's movement phase, despite requiring an action.

Jump Jets are a somewhat bizarre Perk. They are bulky and expensive. Yet, this special ability is useful in three particular circumstances: city fighting, clearing obstacles and the Death From Above tactic. Jump Jets allow vehicles to launch uncanny surprise attacks in urban areas by hopping over obstructing terrain. Jump Jets are also useful for their ability to clear obstacles like walls, ravines, cliffs, and minefields.

Death From Above is a ramming technique which is only available to vehicles with Jump Jets. By leaping towards an enemy unit, a pilot can effectively execute a flying ram. Impact Speed is calculated as normal (see rulebook, page 140), with the ramming direction the same as it would have been for a ground-based ramming attack. Both attacker and defender are damaged by this maneuver. The attacking Mecha's Size is multiplied by two for this action only.

LABORATORIES Some vehicles are equipped with "laboratories": systems that help the crew in specialized tasks. Each laboratory is dedicated towards one particular Skill or Skill specialization. Combat skills (including all Piloting/Driving and all Gunnery) may not have labs, as they are covered by other vehicular systems. Laboratories are rated upon their quality (minimum of 0). This quality rating is added as a modifier to any test performed using the laboratory's skill. Laboratories eliminate any penalty due to missing tools and proper equipment. They can be used to represent specialized rooms such as a tactical command centers (Leadership), galleys (Cooking) or even theaters (Theatrics).

LANDING GEAR Standard landing gear with 3 legs, which can hold the ship upright and stable unless the ground is tilted by more than 30 degrees (0 pt.)

LARGE DOORS The vehicle's crew and passenger compartments are equipped with oversized doors and hatches that allow rapid egress and ingress. For each action spent, two crewmembers (instead of one, as

usual) can exit the vehicle. A number of passengers equal to twice the Size of the vehicle may enter or exit each turn at no action cost.

LIFE SUPPORT A food and air recirculator, sufficient for two people

LIFE SUPPORT Life Support systems provide the vehicle's crew with a sealed and self-supporting milieu, protecting them from hostile environments such as poisonous atmosphere, vacuum and underwater. If this system is destroyed while the vehicle is in a hostile environment, the entire crew immediately become casualties, eliminating the vehicle from combat. All combat vehicles have a basic overpressure system to protect them from most biochemical weapons, so Life Support should be bought only for those vehicles that truly need it.

The limited form of life support includes contingencies for breathing and limited nutritional and excretory needs, and provides support for each crewman only up to the deployment range. The full version of life support includes complete air recycling, proper waste disposal, hygienic and nutritional facilities; it last indefinitely for game purposes.

LIFE SUPPORT – IMPROVED A bigger recirculation system, which doubles the number of people who can live on the ship. Includes acceleration couches and spacesuits for half as many people as can be supported. All brand-name spaceships have a life-support system which can support twice as many people as the ship is designed for (3 pt. to double recirculation system, 9 pt. per spacesuit)

LIGHTER-THAN-AIR Aircraft with this Perk use lighter-than-air gases to stay aloft. Since this uses no Movement Points, Lighter-than-air craft do not fall when their movement systems are disabled or destroyed, though their horizontal movement will be determined by wind alone (see Wind, page 90). Lighter-than-air craft can gain or lose one level of altitude per round without using MPs.

Light damage to the Structure will cause a lighter-than-aircraft to lose one level of altitude per round, without the possibility to gain them back. Heavy Structural damage will cause a two-level drop per round. The envelope can be designed to be self-sealing; when taking Structural damage, airships with this option will suffer the loss of altitude effect only once instead of every round.

A lighter-than-air craft occupies three times as much space as its Size (for example, a Size 10 lighter-than-aircraft will completely fill a tactical hex). Craft with this Perk are considered VTOL craft for determining admissible Perks and Flaws. **Only Flying vehicles can take this Perk.**

LOW PROFILE The vehicle has a very low profile which makes it easier to hide and conceal. Vehicles with this Perk tend to have sloped and compact hulls – for obvious reasons, bipedal walkers generally cannot be designed this way. The vehicle gets +1 to Concealment while in cover (hexes with Obscurement of 2 or more). If the Hull-Down rules are used, it delivers an extra 5 points of protection from its position.

LOUDSPEAKERS These are powerful external loudspeakers. These can be used with sirens, audio systems, communication gear, or any other audio equipment.

MAIN BATTERY (MB) Main Batteries have an unlimited supply of ammunition. A vehicle main battery is considered to be a large railgun but may be defined as any type of large 'spinal-mount' style weapon. It usually fires tacnukes, but may use other munitions for special effects.

MANIPULATOR ARM The vehicle has an arm-like structure that can pick up and manipulate objects. Manipulator Arms are part of the basic layout of practically all exo-vehicles. Small Manipulator Arms can also be installed on any type of vehicle to represent "micromanipulators" used for delicate maneuvers. The arm can lift an object whose Size is equal to or lower than its rating. No matter the rating of a Manipulator Arm, a vehicle cannot lift an item whose Size is greater than twice its own Size. Lifting any mass greater than half the vehicle's own mass will prevent the vehicle from moving. Half the capacity of all weaker arms are added to the full capacity of the strongest arm to determine the lifting strength of multiple arms.

Optionally, Manipulator Arms can be reinforced to punch or crush opponents. These attacks have a Damage Multiplier equal to the rating of the arm. This option adds nothing to the Perk's cost but modifies the Offensive Score (see page 104). For Roleplaying purposes, manipulators can apply pressure equal to half their Size rating, rounded up. The highest weight value for that result on the Size to Mass chart is the pressure applied in tons per square meter.

Manipulator Arms can be used for fine manipulators and tasks which require dexterity. A standard Piloting skill test is required, the threshold varying according to the task. In addition, a negative modifier equal to the difference between the object's Size and the hand's rating is applied to the roll. The Size to Mass table helps to evaluate the Size of the object being manipulated.

MICRO-LABS Microlabs are elaborate workbenches equipped with devices and sensors that are specialized for one task, such as toxin detection or electronic repairs. Microlabs have no tactical application, but they can be invaluable in RPGs.

MINE DETECTORS Mine detectors are a set of highly specialized sensors designed to look for the telltale signs of the presence of minefields. These are very similar to the sensors supplied by the Geological Sensor Perk, but are specially calibrated to detect the mass and faint emissions of buried land mines.

Mine detectors allow the vehicles to detect mines in the same way as an infantry unit with the Mine Sensor equipment (see page 48 of Tactical Field Support): the vehicle's Sensor Rating is added to its Electronic Warfare roll.

MINELAYING EQUIPMENT The Minelaying Equipment Perk is a set of special machinery designed to dig a small trench or a series of holes along the path of the vehicle. The machinery then plants one or more land mines and buries them. The system can also "spray" the smaller antipersonnel mines behind the path of the moving unit for fast deployment (see the advanced mind field rules on page XX of Tactical Field Support).

The whole system is very efficient and can lay up to five pints worth of mines every two minutes (four tactical rounds or twenty Skirmish rounds). The minefield becomes active one minute after the Minelaying vehicle has left the hex, though this delay can be increased if desired. Minelaying Equipment may not be used to place Jumping Mines (see Tactical Field Support).

The mines are not included in the Perk's cost and must be bought separately at the normal cost. The equipment can place any type of mines, except Jumping mines.

MINESWEEPING EQUIPMENT Any vehicle can be equipped with mine-clearing devices, but these will

work only in the primary environment for which the vehicle has been designed. For example, the mine plow of an engineering tank will be useless against naval mines, even if the vehicle has the Amphibious Perk. See page 31 of Tactical Field Support for more on Minesweeping.

The exact nature of the Minesweeping equipment depends on the designer, but most often consists of a mine plow or det-cord launcher on ground vehicles. A small distributor dropping chemiluminescent sticks to mark the cleared path is included at no point cost.

Minesweeping equipment may not be used to attack another unit, unless it has been specifically designed to do so. Attack-capable Minesweeping systems, such as a det-cord launcher, must have their cost included in the Offensive Score. They have a Range of one hex, an Accuracy of -2, a Damage Multiplier of x15 and a TV cost of 10 points per shot.

MINING EQUIPMENT The vehicle is adapted to perform mining functions. Mining equipment must be specified as either light or heavy duty. Light duty mining equipment consists of one or two sampler arms, a small earth-moving blade (or a more conventional bulldozer blade) and a simple winch with a cable strong enough to move the vehicle. Heavy duty equipment is intended for commercial mining operations: in addition to the aforementioned equipment, it includes a large rock grinder, a shovel arm, one or two trenchers and a drill. Ore conveyers are also fairly common.

The mining equipment can be designed to attack opponents in melee combat. The Damage Multiplier equals half the cost of the mining equipment, rounded up. Light duty equipment has poor (-1) Accuracy and heavy duty equipment has very poor (-2) Accuracy. If selected, this ability modifies the Offensive Score of the vehicle.

MISSILES (M) may be fired through a ship's Tubes at an enemy ship. Each Missile does a basic damage of 2 hits if it strikes. The number of hits damage a Missile does may be modified by other factors as per the combat rules. One Build Point will build three Missiles. A ship may be built to carry any number of Missiles, and can never hold more than initially specified. As Missiles are fired, they must be subtracted from the ship's Missile stock on that ship's record. Missiles may not be transferred between ships.

MISSILE – EXTERNAL (MsI) An External Missile is a one-shot weapon. If destroyed or fired it should be marked off the vehicle's record sheet. Each vehicle missile is a one-use weapon. Once each missile is fired it is gone. The defense strength represents the toughness of the missile while it is still being carried by the vehicle. If a missile is destroyed before it is fired, the vehicle cannot use it as an attack. Individual missiles carried by a vehicle are fired and targeted separately.

Some vehicles mount their missiles externally, and can fire any number of their remaining missiles each turn. Thus, an undamaged Mark V can fire up to six missiles in a single turn.

MISSILE – GAS (GM) If it hits – it does damage in Crew code values instead of other components. Treat as missiles otherwise.

MISSILE – INTERNAL (MsII) Other vehicles carry their missiles internally, and require missile racks to launch their attacks. If a unit has missile racks, its missiles *cannot* be targeted separately.

MISSILE RACK (MR) A Missile Rack fires Internal Missiles. The missile rack is a specialized system for firing missiles. Each missile rack may fire one missile per turn. Therefore, an undamaged Ogre Mark IV, with three missile racks, can fire three missiles each turn. The missiles for this system are stored in bays within the vehicle itself and can only be fired through the missile rack. Missiles stored within a vehicle cannot be destroyed. If all of a vehicle's missile racks are destroyed, it may not longer fire any missiles remaining in its storage bays. The destruction of a missile rack destroys one missile at the same time.

The attack strength and range of these missiles are identical to those of standard vehicle external missiles.

NOE FLYER Aircraft with this Perk are equipped with very advanced sensor-assisted flight systems, which allow the aircraft to effectively fly at altitude level zero (NOE, or "Nap-of-the-Earth" flying). This enable the aircraft to avoid most long- and medium-range and detection systems by using the ground's surface features to hide behind.

In game terms, the NOE flight system gives a -2 modifier to any roll on the Aircraft Control Loss Table (see p. 148 of the rulebook) if the aircraft is at altitude level zero. When flying at altitude zero, the vehicle benefits from the Obscurement of ground hexes against ground-based detection attempts and attacks (see page 150 of the rulebook). **Only Flying vehicles can take this Perk.**

NO FUEL REQUIRED The vehicle's main power plant does not require regular fill-ups with fuel or reaction mass. It draws its energy from the environment around it (a solar-powered or sail vehicle, for example). The vehicle still has to undergo basic maintenance from time to time, though. The Deployment Range Rating represents the interval at which basic maintenance must be performed.

Solar sail and magsail vehicles use this system. The sail itself is so thin (or insubstantial, in the case of the magsail) that it causes no damage to anything that comes into contact with it. Solar sails are damaged as normal during collisions. Sails damaged by any means will reduce the vehicle's thrust by 0.01 MP for each ten points of damage suffered. If the thrust falls under half its normal value, the sail collapses and is unusable. For game purposes, solar and magsails have a diameter equal to half the Size of the vehicle, in kilometers.

PASSENGER ACCOMMODATIONS The vehicle is equipped with proper living and sleeping quarters. This is necessary for long range vehicles if the crew and passengers are to remain fresh and alert. There are two quality levels of accommodations available. Military grade accommodations are spartan in design and provide little privacy or comfort. Luxury accommodations occupy about twice the volume of military accommodations but include private sleeping quarters, a small private lounge, and personal hygienic facilities. A vehicle with numerous living accommodations of either type also generally includes a few common rooms such as galleys and lounges, and thus most devote more space to accommodations.

Military grade accommodations for one person start at two cubic meters in size, while civilian accommodations can be as big as a thousand cubic meters on very large vehicles. As a guideline, a minimum of 25 cubic meters (¼ CP/5 spaces) per person are required for any moderately long occupations. Accommodations can also serve as makeshift cargo bays if the furniture is removed (assume that one person-minute per cubic meter are required for the conversion). The passenger accommodations' volume is added to the vehicle's to get a total volume.

Passenger accommodations usually take up a lot of room, but even civilian vehicles can have military-grade accommodations to cut costs. A good example of this is the sleeping cab found behind the driver on many long-haul trucks.

PASSENGER SEATING The vehicle has extra seats for passengers. The passengers do not confer any extra actions to the vehicle, nor can they control it. They do, however, count as crew for damage purposes (any damage should be randomized between crew and passengers). Passengers cannot use the crew's ejection system (if any); this must be purchased separately, at the same cost as for normal crew. A number of passengers equal to the Size of the vehicle may enter or exit each turn at no action cost, provided the vehicle is moving no faster than 12 kph.

PINTLE MOUNT An infantry weapon installed on a swivel mount just outside a hatch is said to be pintle mounted and must be operated by one of the vehicle's crewmen. That crewman can do nothing else and is exposed to enemy fire (count as Partially Exposed Crew, unless the vehicle is already open topped). Pintle Mounts have a 180 degree arc of fire chose at the time of design. The weapon is not protected by the vehicle's armor and count as an Auxiliary system. Fire Control hits neither affect pintle mounted weapons nor does the Fire Control bonus apply to them. Firing penalties are equal to -1 for more than half and up to Combat speed, and -2 for Top Speed, in addition to any other modifiers.

Pintle mounts are quite simple and add little to the cost of the vehicle. Any type of infantry weapon can be mounted on them. The cost of the weapon is equal to its DM plus its Base Range plus its ROF in vehicle scale, and is added directly to the vehicle's final Offensive Score.

POINT-DEFENSE BEAMS (PDB) As the "Beams" ship system can only target a single enemy in a given combat round, combats involving many small ships are lengthened unless you add a new ship system, Point-Defense Beams (PDB), which are powered the same way as Beams but are split up into single unit batteries each of which can target a different enemy ship. So, a ship with PDB = 3 can fire the equivalent of B=1 at up to three different enemy ships (or B=2 at one ship and B=1 at another). Note that if all three PDB's are fired at a single target then PDB behaves just like regular Beams, thus it is better than Beams and you must pay the price for that advantage. There is a structural overhead cost of 1 BP per 3 PDB installed, round fractions up. Allowing PDB gives fighters something to worry about and also recreates some of what we see in the Babylon 5 universe.

POWER/DRIVE (PD) represents the total effective strength of a ship's engines. During movement, the PD of a Warship divided by 2 and rounded up gives its movement allowance in hexes. During combat, the PD strength of a ship is allotted to its drive and weapons so that those may operate. During combat, a ship may NEVER allocate power from PD in excess of the available PD strength. Each unit of PD strength costs one BP to build.

The specifics of each engine aren't important except that the following capabilities are applicable to the most common types of engines:

PD	Acceleration	Maximum MPH	Speed
¼	5 mph	70 mph	Speed 5
1/3	5 mph	75 mph	Speed 5
½	5 mph	80 mph	Speed 5
1	5/10/15 mph*	90 mph	Speed 6
2	10/15 **	100 mph	Speed 4/3
3	5/10 ***	200 mph	Speed 7/6

* Accel 5 mph if Size 1; Accel 10 mph if Size ½; Accel 15 mph if Size 1/3 or less

** Accel 10 mph if Size 2 or more; Accel 15 mph if Size 1 or less

*** Accel 5 mph if Size 3 or more; Accel 10 mph if Size 2 or less

PD	Minimum Engine Size
1 PD per Size	Size 1-5
PD 6	Size 6-10
PD 7	Size 11-22
PD 8	Size 23-30
PD 9	Size 31-50
PD 10	Size 51+

PRIVATE SYSTEM This perk allows a transformable vehicle to avoid damage being carried over to all its forms. The perk must be bought separately for any or all four main sub-systems of the vehicle: Fire Control, Structure, Movement and Auxiliary Systems. When damage is received on a system protected by this perk, the damage does not transfer to the other forms. The cost of the Perk is equal to 2 per system or 7 for all four of them.

RADIO A broadcast radio capable of transmitting and receiving all normal communication frequencies (2 pt.)

RAM PLATE Part of the chassis of the vehicle has been specially reinforced to withstand high speed impact.

Each ram plate must be assigned to a ramming arc. The vehicle takes only half the normal damage in a collision, provided the impact is in the same arc as the Ram Plate.

REACTIVE ARMOR Reactive Armor is an advanced development of a millennia old concept. It is not composed of actual armor plates, but rather is a set of directional fragmentation mines mounted on the hull of the vehicles. A series of small dedicated sensors denotes one more charges in the direction of an incoming attack, hopefully redirecting it or at least reducing its efficiency. The explosion counteracts HEAT-effect charges and sprays anti-laser aerosol to diffuse and refract laser beams.

Reactive Armor is always active. Because of balance problems, vehicles using the Walker movement system cannot have Reactive Armor at a Rating higher than 1. Each defense arc must be individually protected.

Reactive Armor reduces the Margin of Success of a HEAT attack by an amount equal to its Rating. If the Margin of Success of the attack drops below 1, no damage is done. If other units (friends or foes) are present in the hex when the reactive armor is activated, they automatically take a number of damage points equal to the Rating

of the system times the Size of the vehicle, times the result of die.

Because the actual number of charges used to repel each assault is highly variable, Reactive Armor does not use ammunition but roll against an Ammo Threshold. Every time the system is used, roll two dice: if the total is higher than the Ammo Threshold, the system has run out of charges. If the roll is equal or lower, the system works - lower the MoS and increase the Ammo Threshold by one. Fumbles are discarded and count as a roll of one. The Threshold starts at 0, so there is enough ammunition for at least two interceptions (Thresholds 0 and 1).

Firing Reactive Armor charges does not use up actions and works until the system runs out of charges (the roll is above the Ammunition Threshold) or is destroyed in combat.

Reactive Armor is an AUX system, but damage is applied differently. On a Light damage result, add one to the Ammo Threshold. On a Heavy damage result, all charges on the facing hit are detonated and lost, effectively taking the system out of the fight. All charges must be replaced after a battle.

REDUCED G-EFFECT Aircraft with this Perk have been modified to reduce the strain of pulled Gs (acceleration) on its crew, either through special cockpits, seats or flight suits. The pilot has a +1 bonus whenever he has to make a ST roll due to sharp turns or other quick accelerations.

REENTRY SYSTEM The vehicle has been specially reinforced to withstand the high temperature and stress of atmospheric reentry. Every five turns, the pilot must make a Piloting roll against a Threshold of 2 to keep the craft correctly oriented or suffer one Fire attack as per normal reentry rules (see Jovian Chronicles rulebook, p. 143). Modifiers due to damage apply in full.

REFUELING EQUIPMENT This Perk allows a vehicle to be refueled on the move. The refueling boom consists of enough equipment to refuel one vehicle at a time. The fuel is usually carried within a cargo bay, but the refueler can use its own Deployment Range or Reaction Mass instead. Both pilots must roll their Piloting skills vs. 4; if either fails, the refueled vehicle takes on only 1d6 x 10% of the intended load. A fumble means a collision occurred, and the refueling equipment on both vehicles is out of service. A refueling attempt may be made every three minutes (6 rounds). Suggested time for total refueling is one round per point of Size of the target (plus the three minutes for hook-up).

REINFORCED ARMOR The vehicle has one or more facings (arcs of defense) with better or thicker armor than the rest of the vehicle. When the vehicle is hit in an arc that is reinforced, the rating of this Perk is added to the base Armor rating of the vehicle. Four possible arcs can be reinforced: Front, Rear, Right Rear Flank and Left Rear Flank. Up to three of these arcs can be reinforced on a single vehicle.

REINFORCED CHASSIS The frame of the vehicle is designed to absorb considerable punishment. The vehicle may ignore the first Structure hit on the Systems Damage Table, but then loses this Perk. The Perk's effect can be restored by a normal repair if a technician works on the vehicle after combat. This Perk may be taken more than once.

REINFORCED CREW COMPARTMENT The crew compartment is layered with additional armor and fitted with crash-absorbing material. The vehicle may ignore the first Crew hit on the Systems Damage Table, but then loses this Perk. Crew casualties from Structure hits are unaffected, however. The Perk can be restored by normal repair if a technician works on the vehicle after combat. This Perk may be taken more than once.

REINFORCED LOCATION ARMOR One of the vehicle's locations has better armor than the rest of the vehicle. When the vehicle is hit in a reinforced location, the rating of this Perk is added to the base Armor rating of the vehicle before deterring damage. This Perk cannot be taken more than twice per vehicle.

REPAIR BAYS (R) cost 5 BP. A ship with a Repair Bay may use BPs in Hold or from Star to repair itself or any number of other ships present on the same star hex during the build/repair event. BPs mined from Baseless Stars may be used immediately to repair by ships with Repair Bays. Repair Bays like Warp Generators do not take damage in combat and are destroyed when the Warp Generator is destroyed.

ROBOT DOCTOR A robot doctor, which regenerates a character's lost BODY pips at the rate of 1 per hour, even if he is below 0 BODY. In Danger International terms, the robotoc always makes its Paramedic roll. Only one creature may be treated at a time, and the GM may rule that some wounds (such as alien fungi) are beyond the robotoc's programming (14 pt.).

ROOMS For convenience, assume that each 'room' option taken adds 1 meter to any one linear dimension of the ship (length, width, height). Mass increase is left to the GM; one interesting approach is to treat every two or three options as one level of Growth, and figure mass from this. The options:

- **Bathroom** A bathroom with zero-g shower
- **Cargo** Increased cargo room: 2x as much cargo room and -1 G thrust. If the thrust falls below 1 G you must buy "Stronger Impulse Engines."
- **Concealed cargo room:** One hex of room which requires a Concealment roll to find. It may be smaller and better hidden for the same cost: 1/2 hex gives -2 to others' Concealment rolls, 1/4 hex gives -4, etc.
- **Danger room:** an extensive, many-person gymnasium, full of exotic equipment (3 BP. per hero using it)
- **Laboratory** A science lab, providing +3 to one Science (e.g., Physics, Chemistry, Biology, etc.) (2 pt.)
- **Lounge** A lounge room with a bar, projection TV, comfortable seats, etc. (1 pt.)
- **Quarters** A bedroom, living quarters for one person comfortably or two cramped
- **Repair Room** A ship repair room, containing tools and parts needed for minor mechanical, electrical, and engine repairs. Usually any system which has taken more than 2 BODY will require more equipment than this option provides, but the GM may grant an exception ("I need warp speed in three minutes or we all die!") (2 pt.)
- **Sickbay** A sickbay and medical research lab, providing +3 to Paramedic rolls for most known species (2 pt.)
- **Swimming Pool** A small swimming pool (in a special spherical room, with watertight doors) (1 pt.)
- **Swimming Pool - Large** Olympic-size swimming pool, mounted on gimbals (3 BP)