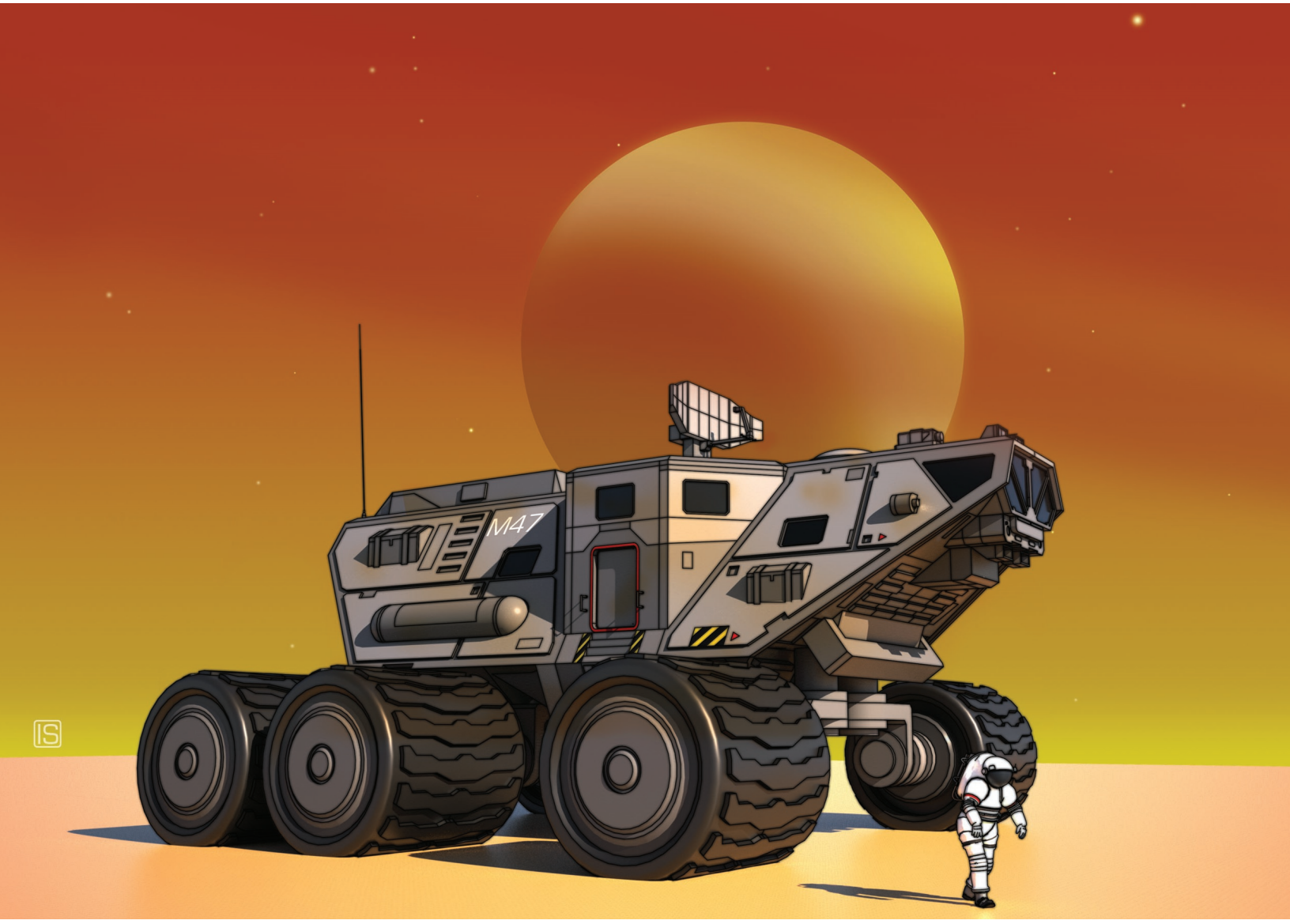
Cepheus Engine

Vehicle Design System



A Classic Era Science Fiction 2D6-Based Open Gaming System Supplement

From Samardan Press Publications

Cepheus Engine
Vehicle Design System

Vehicle Design For A Classic Era Science Fiction 2D6-Based Open Gaming System

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INTRODUCTION

Welcome to the ***Cepheus Engine Vehicle Design System (VDS)***, which outlines the core vehicle design rules for the ***Cepheus Engine***, a Classic Era Science Fiction 2D6-Based Open Gaming System. The first chapter shows you how to create vehicles for your own exciting science fiction adventures, and later chapters provide a series of common vehicles for use in your Cepheus Engine games.

This system is inspired by the design system outlined in **Chapter 8: Ship Design and Construction** from the ***Cepheus Engine Core Rules***. Hopefully, Referees and players alike will find familiarity with one system helps with creating vessels in the other system.

On Creating a Playable Level of Detail

While no vehicle design system can successfully duplicate every possible Real World™ example, the ***Cepheus Engine Vehicle Design System (VDS)*** does make an effort to accommodate as many designs as possible. At the end of the day, however, that the goal of this design system is to create playable game statistics for vehicles, not recreate modern vehicles down to the nuts and bolts of muzzle velocities and surface areas, etc.

As such, some generalizations have to be assumed, as this design system aims to create a playable level of detail while still empowering Referees and players to create interesting vehicles. Weapons are not broken down by caliber or bore size. Instead, armament options for light and heavy weapons allow for designing weapons of differing power levels compared to one another. Drive options for fuel efficiency and agility are other tools to help create differences in similar vehicles from a comparison perspective.

Remember that ultimately, this design system is yours to do with as you will. If you can't build what you want with it as is, feel free to change it or extend it to meet your own personal needs. If you are a player, however, please be sure to get your Referee's approval first.

Important Terms

The ***Cepheus Engine Vehicle Design System*** uses certain words and abbreviations throughout the rules system. In order properly understand the ***Cepheus Engine Vehicle Design System*** rules, both players and Referees should become familiar with these terms. The following words, phrases and abbreviations are commonly used in this supplement:

Artillery Gun: A high velocity explosive thrower firing chemically propelled rounds (CPR).

Autocannon: A high velocity slug thrower with a high rate of fire.

Chassis: The chassis is the shell in which all of the other components of the vehicle design process are placed.

Credit (Cr): The primary unit of currency used in the ***Cepheus Engine***. For very large amounts of money, the kilocredit (KCr) represents one thousand credits and the megacredit (MCr) represents one million credits.

Disintegrator: A weapon that disrupts the strong molecular attraction that holds matter together, causing the target area to disintegrate on a subatomic level.

Displacement Ton (or Ton): A measure of volume displacement equivalent to the volume that is displaced by one metric ton of liquid hydrogen, or roughly 14 cubic meters. Tons are commonly used in both ***Ship Design*** and ***Trade & Commerce***.

Drive: General term to describe engines, power plants and propulsion systems.

Fusion Gun: A very high powered plasma weapon which actually attains fusion of hydrogen in its beam.

Howitzer: A type of artillery piece characterized by a relatively short barrel and the use of comparatively small propellant charges to propel projectiles over relatively high trajectories, with a steep angle of descent.

Machine Gun: A fully automatic mounted firearm designed to fire ammunition at a high rate of fire over a sustained period of operation.

Mass Driver: A high velocity slug thrower that relies on electromagnetic or gravitic forces to impart a very high kinetic energy to clusters of dense matter.
Meson Accelerator: A particle accelerator that projects a stream of mesons, calculated to decay while within the target, therefore remaining unaffected by traditional armor.
Mortar: An indirect fire explosive thrower that fires projectiles at low velocities and short ranges. Mortars must be used from a world's surface.
Plasma Gun: An energy weapon that fires a high-energy beam of subatomic particles, disrupting the molecular structure of the target on impact.
Railgun: A smaller variant of a Mass Driver designed for smaller, more maneuverable vehicles.
Rocket Artillery: A type of artillery equipped with rocket launchers for firing self-propelled munitions.
Space: Within the vehicle design system, a space is a measure of volume displacement that is approximately equal to 1.167 cubic meters or 1.167 kiloliters. For the sake of simplicity, the vehicle design system assumes that there are 12 spaces to a displacement ton. The rest of the tonnage is used for miscellaneous things, such as wires, ducts, rope, support beams, and other items as appropriate to the tech level and purpose of the vehicle.
Vehicle: General term for a vessel that displaces 20 tons or less, and generally restricted to operation on a single world. The design system in this supplement is intended to create vessels that meet this description.
Vessel: General term used to starships, small craft, or vehicles as a general inclusive group. Most commonly, it refers to any vehicle or ship capable of interplanetary or interstellar travel.

New Skill

The ***Cepheus Engine VDS*** introduces a new skill, Airship, which is considered part of the Aircraft cascade skill.

Airship

This skill grants the ability to properly maneuver and perform basic, routine maintenance on balloons and airships of any sort. Such vehicles attain lift from a body of gas that is lighter than the surrounding atmosphere.

Vehicle-Mounted Weapon Ranges

Some vehicle-mounted weapons use the range classifications outlined in the ***Cepheus Engine*** core rules. However, many do not. The following table combines the standard weapon ranges and the weapon ranges used by the new weapons outlined in the ***Cepheus Engine Vehicle Design System***. The following abbreviations are used to make the table easier to read:

Table: Task Difficulty Abbreviations

Task Difficulty	Abbreviation
Average	Avg
Difficult	Diff
Very Difficult	VDiff
Formidable	Form

Table: Attack Difficulties by Weapon Type

Weapon	Personal	Close	Short	Medium	Long	Very Long	Distant	Very Distant	Extreme	Continental
Close Quarters	Avg	Diff	--	--	--	--	--	--	--	--
Extended Reach	Diff	Avg	--	--	--	--	--	--	--	--
Thrown	--	Avg	Diff	Diff	--	--	--	--	--	--
Pistol	Diff	Avg	Avg	Diff	VDiff	--	--	--	--	--
Rifle	VDiff	Diff	Avg	Avg	Avg	Diff	VDiff	--	--	--
Shotgun	Diff	Avg	Diff	Diff	VDiff	--	--	--	--	--
Assault Weapon	Diff	Avg	Avg	Avg	Diff	VDiff	Form	--	--	--
Rocket	VDiff	Diff	Diff	Avg	Avg	Diff	VDiff	--	--	--
Very Long	--	Diff	Avg	Diff	VDiff	Form	--	--	--	--
Distant	--	VDiff	Diff	Avg	Diff	VDiff	Form	--	--	--
Very Distant	--	VDiff	Diff	Avg	Avg	Diff	VDiff	Form	--	--
Extreme	--	Form	VDiff	Diff	Avg	Avg	Diff	VDiff	Form	--
Continental	--	Form	VDiff	Diff	Avg	Avg	Avg	Diff	VDiff	Form

CHAPTER 1: VEHICLE DESIGN

Within a ***Cepheus Engine*** campaign, adventurers will likely travel to a great multitude of worlds and environments, encountering a wide range of vehicles along the way. Whether on land (automobiles, horse-drawn carriages, motorcycles, tanks, etc.), in the air (such as airplanes, grav vehicles and helicopters), in the oceans (with boats, hovercraft and submarines) or even through the earth itself (moles), adventurers are likely to encounter a wide range of vehicles. This chapter provides rules for the design and construction of such vessels for use in ***Cepheus Engine*** campaigns.

Standard Designs vs. New Designs

An interstellar economy provides an excellent opportunity for the use of standardized and modular vehicle designs, as well as a wide range of markets. Components can be crafted on different worlds, taking advantage of available resources, and then put together to create a final product. Manufacturers take advantage of modular components and standardized designs to reduce costs in production, leading to a 10% discount on vehicles constructed using common designs, such as those described in the other chapters of this supplement. The Referee may designate other vehicle designs as standard designs, as befits their universe. Fuel and weapon ammunition are not covered by the Std Design Discount.

New and unique vehicle designs cannot take advantage of standardized and modular design. These vehicles must be designed by a vehicular design specialist, who creates detailed design plans based on a set of specifications provided by their client. Such plans take a month to create, and costs approximately 1% of the final price of the vehicle, to a minimum of Cr100.

Displacement Tons and Spaces

Chassis and other vehicle components are measured by their displacement volume. For ships and small craft, displacement volume is measured in the volume of space that is displaced by one metric ton of hydrogen, referred to in this design sequence as displacement tons or simply tons.

Because the components for vehicles are often fractions of a ton, the ***Cepheus Engine Vehicle Design System (VDS)*** uses an artificial measure of volume to make things a little easier. A space in this design system is equal to one-twelfth of a displacement ton; i.e. there are 12 spaces in one ton.

Design Considerations

When designing a vehicle, it is important to consider two things: the vehicle's purpose, and the Tech Level at which it will be produced. The design process flows more smoothly when you keep these two factors in mind.

The Price Impact of Modifications

Some modifications to a vehicle component, often classified under Options that can be applied to that component, modify the original price of that component. Modifications that decrease the price of a vehicle component cannot lower it below 25% of the original price.

Vehicle Design Checklist

The ***Cepheus Engine Vehicle Design System (VDS)*** follows a very methodical process.

1. Choose a Vehicle Chassis
    a. Determine chassis configuration
    b. Determine open or closed chassis
    c. Install armor (optional)
2. Choose locomotion/propulsion
3. Choose power supply
4. Determine fuel requirements
5. Choose vehicle's controls
6. Choose vehicle's communications system (optional)
7. Choose vehicle's sensor package (optional)
8. Choose vehicle's computer system (optional)
    a. Choose computer software
9. Determine number of required crew
    a. Choose accommodations (cockpit, cabin, extended accommodations)
10. Determine additional components (optional)
11. Determine turrets, fixed mounts, etc. (optional)
    a. Determine weapons (optional)
12. Allocate remaining space to cargo
13. Calculate final price and construction time
    a. Apply Std Design Discount of 10% (optional)

Vehicle Chassis

The vessel's chassis is the shell in which all other components are placed. An unarmored vehicle's construction time is based on its chassis size, as outlined on the **Vehicle Chassis by Displacement** table. To find the construction time for armored vehicles, simply multiply the vehicle's base construction time by the amount of ***additional*** armor the vehicle will possess. For example, a 10-ton Armored Fighting Vehicle (AFV) with a total of 12 Armor would take (base of 90 hours, times 12, equals) 1080 hours, or 45 days, assuming round-the-clock construction.

Custom-Made Vehicles: The construction time listed is for mass production of a standard design. A custom-made vehicle takes approximately ten times as long to construct.

Table: Vehicle Chassis by Displacement

Chassis Code	Tons	Spaces	Price (Cr)	Construction Time (hours)	Size Example
1	0.1	1	1,450	1	8 Standard Moving Boxes
2	0.25	3	1,600	2	Motorcycle
3	0.5	6	1,850	5	
4	0.75	9	2,100	7	Compact Car
5	1	12	2,400	9	Mid-Size Car
6	2	24	3,550	18	Passenger Van
7	3	36	4,850	27	20-ft Standard Freight Shipping Container (1CC)
8	4	48	6,250	36	Air/Raft
9	5	60	7,800	45	Military Tank
A	6	72	9,550	54	Speeder
B	7	84	11,350	63	
C	8	96	13,350	72	Semi Trailer
D	9	108	15,450	81	
E	10	120	17,750	90	ATV
F	11	132	20,150	99	
G	12	144	22,650	108	
H	13	156	25,350	117	
J	14	168	28,150	126	
K	15	180	31,100	135	
L	16	192	34,200	144	
M	17	204	37,400	153	
N	18	216	40,750	162	
P	19	228	44,250	171	
Q	20	240	47,900	180	

Vehicle Configuration

A vehicle may have one of two configurations – Closed or Open.

Closed Vehicles: Closed vehicles grant cover to the occupants – unless the description mentions otherwise civilian vehicles grant ½ soft cover and military vehicles full hard cover. Only a few people in a closed vehicle can shoot out, depending on the number of windows or other firing ports and the internal space available. Unless the description mentions otherwise, up to two people can fire into each arc from a civilian vehicle and one person in each arc in a military one.

Note that closed vehicles are not sealed or airtight. They are just enclosed, offering some basic protection to the occupants within the vehicle. In order to provide complete atmospheric protection, the appropriate Environmental Protection System(s) must be installed, as provided in under Vehicle Configuration Options.

Open Vehicles: Open vehicles possess an open passenger area, which reduces the final price by 10% of the Base Price. Airplanes, jets and hypersonics cannot have an Open configuration. Open vehicles grant no cover to the passengers. Any passenger in an open vehicle can shoot (or otherwise attack) in any direction.

Table: Vehicle Configuration

Configuration	Chassis Price Modifier	Notes
Closed	x1	
Open	x0.9	

Vehicle Configuration Options

The following are options that can be added to a vehicle's configuration.

Corrosive Environmental Protection System (TL 9): The Corrosive Environmental Protection System can be installed in any vehicles with a closed chassis to safeguard the vehicle and its crew in corrosive environments. Corrosive Environmental Protection protects against corrosive environments, very hot or very cold environments, radiation, poisons and bacteriological threats. This system takes up 6 spaces and costs Cr10,000 per Space of chassis. This system requires the purchase of Life Support.

Hostile Environmental Protection System (TL 7): The Hostile Environmental Protection System can be installed in any vehicles with a closed chassis to safeguard the vehicle and its crew in hostile environments. Hostile Environmental Protection protects against very hot or very cold environments, radiation, poisons and bacteriological threats. This system takes up 3 spaces and costs Cr5,000 per Space of chassis. This system does not require Basic Life Support, although it can prove highly useful.

Hydrofoils: Hydrofoils may be applied to any aquatic surface vessel. Hydrofoils increase the chassis price by 300%, and multiply the base speed of the vehicle by 3.

Insidious Environmental Protection System (TL 9): The Insidious Environmental Protection System can be installed in any vehicles with a closed chassis to safeguard the vehicle and its crew in insidious environments. Insidious Environmental Protection protects the vehicle and crew from insidious atmospheres for 5 days, before Hull/Structure integrity begins to fail at one point per day, as well as providing protection against very hot or very cold environments, radiation, poisons and bacteriological threats. This system takes up 6 spaces and costs Cr50,000 per Space of chassis. This system requires the purchase of Life Support.

Open Cargo Bed: Reduces the chassis price by 20%. Airplanes, jets and hypersonics cannot have Open Cargo Beds. Open configuration vehicles with an Open Cargo Bed combined reduce the chassis price by 25%.

Open Frame: An Open Frame means that no additional armor can be fitted on the vehicle. However, this reduces the chassis price by 50%.

Self-Sealing (TL 9): A self-sealing chassis automatically repairs minor breaches, and prevents chassis hits from leading to explosive decompression in vacuum environments (if the Vacuum Environmental Protection System is installed). It costs Cr10,000 per ton of chassis.

Streamlined: Streamlining a thrust-based vehicle increases the chassis price by 300%. Streamlining multiplies the Base Speed of the vehicle by 5. Streamlining can be applied to any thrust-based vehicle with a closed configuration. Streamlining may not be retrofitted; it must be included at the time of construction.

Submersible: Submersible may be applied to any aquatic vessel, allowing it to submerge below the ocean's surface. The Submersible configuration option increase the chassis price by 500%. Base Speed for a submersible reflects the vessel's speed underwater. The vehicle's Base Speed is halved when the vehicle is travelling on the ocean's surface in good weather conditions.

Submersibles are rated by their Safe Dive Depth and Crush Depth, as determined by the vessel's Tech Level. These values are calculated for a Size 8 world. For every point of world size difference, up or down, add or subtract (respectively) 10% from the Safe Dive and Crush Depth values.

When increasing Safe Dive/Crush Depth for a submersible, for every doubling of the Safe Dive and Crush Depth, the vehicle loses half of its remains spaces (rounded off) to ballast to bring the vehicle lower into the ocean. Each doubling costs of 100% of the chassis price of the submersible.

An open chassis submersible, such as a dive sled, does not protect its drivers or passengers from the pressures of the depths of the ocean.

All submersibles get Basic Life Support and Hostile Environment Protection for free.

Table: Submersible Safe Dive Depth and Crush Depth by Tech Level

Tech Level	Safe Dive Depth (m)	Crush Depth (m)
4–5	50	150
6–8	200	600
9–11	600	1,800
12–14	2,000	6,000
15-16	4,000	12,000
17+	8,000	24,000

Vacuum Environmental Protection System (TL 6): The Vacuum Environmental Protection System can be installed in any vehicles with a closed chassis to safeguard the vehicle and its crew under vacuum conditions. Vacuum Environmental Protection protects against vacuum conditions, very hot or very cold environments, radiation, poisons and bacteriological threats. This system takes up 3 spaces and costs Cr10,000 per Space of chassis. This system requires the purchase of Life Support.
Wave-Piercing Hull: The Wave-piercing Hull puts the payload of a watercraft on streamlined pillars above the water that connect to power/fuel modules that run underwater. Interface friction is much reduced, allowing the Wave-piercing Hull to be much more efficient and stable. This increases its Base Speed by 10%. The Wave-piercing Hull uses 5% of a vehicle's Spaces (round up) and costs 200% of the chassis price.

Vehicle Armor

All vehicles start with a base amount of armor, depending on their construction materials, as outlined in the **Vehicle Armor by Type** table. All additional vehicle armor, regardless of armor type, is added in 5% increments of the vehicle's volume, in Spaces. A vehicle's armor decreases ambient radiation exposure by 10 rads per point of armor. (This does not apply to meson attacks and nuclear missiles, which bypass the armor or breach the chassis to deliver their radiation hits.) Note that these armor values are measured on the Personal Combat scale. The maximum armor a vehicle can carry is 20% of the chassis.

Table: Vehicle Armor by Type

Armor Type	TL	Base	Additional Protection	Price	Max Armor
Wood	1	1	1 per 5% of chassis, min. 1 space	10% of base chassis	5
Iron	4	2	2 per 5% of chassis, min. 1 space	10% of base chassis	10
Titanium Steel	7	3	3 per 5% of chassis, min. 1 space	10% of base chassis	15
Crystaliron	10	4	4 per 5% of chassis, min. 1 space	20% of base chassis	20
Superdense	12	5	5 per 5% of chassis, min. 1 space	20% of base chassis	25
Bonded Superdense	14	6	6 per 5% of chassis, min. 1 space	50% of base chassis	30
Coherent Superdense	17	8	8 per 5% of chassis, min. 1 space	50% of base chassis	40

For example, a heavily armored TL14 grav tank might take Bonded Superdense armor twice. This would take up 10% of the chassis volume (in spaces, minimum 2 spaces) and cost 100% of the base price of the chassis, but give 12 additional points of armor.

Vehicle Armor Options

The following are options that can be added to a vehicle's armor.
Electrostatic Armor (TL 9): This armor can be set to generate an electrostatic field that, when triggered by a person or creature, inflicts 6D6 damage. The armor may discharge twice before needing to recharge, and

completely recharges after six seconds without a discharge. Electrostatic Armor requires one Space for the supporting capacitor and associated electronics, and costs Cr10,000.

Reflec (TL 10): Reflec coating on the chassis increases the vehicle's armor against lasers by 3. Adding Reflec costs Cr100,000 per ton of chassis and can only be added once.

Reinforced Hull: A vehicle's Hull can be reinforced through enhanced structural engineering, increasing its Hull rating in Personal Combat by +1. This costs 20% of the vehicle's chassis price. This can be selected twice for a total of +2 to the vehicle's Hull.

Reinforced Structure: A vehicle's Structure can be reinforced through enhanced engineering designs, increasing its Structure rating in Personal Combat by +1. This costs 20% of the vehicle's chassis price. This modification can be selected twice for a total of +2 to the vehicle's Structure.

Stealth (TL 11): A stealth coating absorbs radar and lidar beams, and also disguises heat emissions. This imposes a –4 DM on any Comms rolls to detect or lock onto the vehicle. Adding Stealth costs Cr100,000 per ton of chassis, and can only be added once.

Vehicle Hull and Structure

Initial damage is applied to the Hull value of the chassis; once the chassis has been breached (i.e. the Hull value of the vehicle has reached zero), further damage goes to the Structure. When all Structure Points have been lost, the vehicle has been smashed to pieces. On the Space Combat scale, every vehicle has 0 Hull Points and 1 Structure Point. On the Personal Combat scale, a vehicle has one Hull Point per 5 tons of displacement (rounded down) and one Structure Point per 5 tons of displacement (rounded up). This is summarized in the **Vehicle Hull and Structure, Personal Combat Scale** table.

Table: Vehicle Hull and Structure, Personal Combat Scale

Tons	Hull	Structure
0.1-4	0	1
5	1	1
6-9	1	2
10	2	2
11-14	2	3
15	3	3
16-19	3	4
20	4	4

Vehicle Drives

All vehicles are generally built with at least one source of power (commonly referred to as the engine or power plant) and one source of propulsion or locomotion to provide movement for the vehicle. Propulsion is defined as either contact-based (requiring contact with the ground to provide motion) or thrust-based. Within the ***Cepheus Engine VDS***, all engines, power plants and propulsion systems are categorized as drives.

Power Plants: Within this design system, the values of the **Vehicle Drive Costs** tables make certain assumptions. Power plant values represent the fusion engine. The **Vehicle Power Plant Types** table offer adjustments to represent the impact of alternate power sources.

Propulsion Systems: The contact-based propulsion system values represent the transmission and suspension of wheeled vehicles. The thrust-based propulsion system values represent the suspension of grav vehicles. The **Vehicle Propulsion Types** table offers adjustments to represent alternate propulsion systems.

Base Speed: The base speed of a vehicle is determined by its propulsion drive performance and its propulsion type, as outlined in the **Vehicle Base Speed by Drive Performance** table. Base speed is measured in kilometers per hour (kph), unless otherwise specified.

A vehicle with a propulsion system must have a power source with a drive code equal to or greater than that of the vehicle's propulsion. When determining the drive performance of a power plant or a contact-based propulsion system using the **Drive Performance by Chassis Volume** tables, treat a zero (0) entry as a '—' entry. For a thrust-based propulsion system, a zero (0) means that the thrust from the propulsion system is capable of supporting the vehicle itself in position, hovering in place, but cannot perform any actual propulsion. This allows vehicle designers to create vehicles that only move down or remain stationary, but can't move up or forward at any significant speed. This is primarily used for robots and drones that need to remain stationary in turbulent circumstances.

Animal-Powered or Wind-Powered Vehicles: Vehicles that possess no internal power plant or engine, such as those propelled by wind or pulled by living creatures, do not require a power plant as defined in this section, since their power comes from an external source. In this case, the vehicle must possess a drive capable of achieving a drive performance of at least 1. For more details on wind-powered or animal-powered vehicles, see **Non-Powered Vehicles** in the **Special Rules** section of this chapter.

Table: Vehicle Power Plant Types

Power Plant Type	TL	Space Mod	Price Mod	Fuel
External Combustion	3	x15	x0.20	Coal or Wood
Internal Combustion	5	x6	x0.05	Hydrocarbons
Fission	6	x2	x2	Radioactives
Fuel Cell (Closed)	7	x1.5	x2.5	Hydrogen
Fuel Cell (Open)	7	x1	x1	Hydrogen
Gas Turbine	7	x2	x0.25	Hydrocarbons
Early Fusion	9	x1	x1	Hydrogen
Fusion	12	x0.75	x1	Hydrogen
Advanced Fusion	15	x0.5	x2	Hydrogen
Antimatter	17	x1	x1	Hydrogen

Table: Vehicle Propulsion Types

Propulsion Type	TL	Type	Space Mod	Price Mod	Examples
Sails, Non-Powered	1	Thrust	x1	x0.2	Sailing Ship
Wheels, Non-Powered	1	Contact	x1	x0.5	Stagecoach
Rails	3	Contact	x2	x1	Train
Screw Propeller	3	Thrust	x1	x0.1	Motor Boat, Steamship
Airship	4	Thrust	x1	x0.5	Dirigible
Rotor	4	Thrust	x2	x0.5	Biplane, Helicopter
Tracks	4	Contact	x1	x2	Tank
Wheels	4	Contact	x1	x1	Ground Car
Jet	5	Thrust	x2	x2	Twin-Engine Jet
Mole	5	Contact	x2	x8	Mole
Air Cushion	7	Thrust	x1	x0.5	Hovercraft
Hypersonic	8	Thrust	x1.5	x4	Passenger Air Liner
Legs	8	Contact	x2	x4	Walker
Grav	9	Thrust	x1	x1	Air/Raft, Speeder
Advanced Grav	12	Thrust	x0.75	x2	Grav Bike
Extreme Grav	15	Thrust	x0.5	x4	G/Carrier

Table: Vehicle Drive Costs

Drive	Power Plant		Contact-Based		Thrust-Based	
Code	Spaces	Price (Cr)	Spaces	Price (Cr)	Spaces	Price (Cr)
A	0.11	125	0.15	150	0.12	6,000
B	0.26	300	0.4	400	0.3	15,000
C	0.4	450	0.55	550	0.5	25,000
D	0.75	850	1	975	0.75	37,500
E	1.25	1,425	1.6	1,575	1.4	70,000
F	1.75	1,975	2.3	2,250	2	100,000
G	2.25	2,550	3	2,925	2.5	125,000
H	2.75	3,100	3.5	3,425	3	150,000
J	3.5	3,950	4.5	4,400	4	200,000
K	4	4,500	5.25	5,125	4.5	225,000
L	4.5	5,075	6	5,850	5.25	262,500
M	5.25	5,925	7	6,825	6.25	312,500
N	6.75	7,600	9	8,775	8	400,000
P	7.5	8,450	10	9,750	8.5	425,000
Q	8.5	9,575	11	10,725	10	500,000
R	9.5	10,700	13	12,675	11.5	575,000
S	10.5	11,825	14	13,650	12	600,000
T	12	13,500	16	15,600	13.5	675,000
U	13.5	15,200	18	17,550	16	800,000
V	15.5	17,450	21	20,475	18	900,000
W	18.5	20,825	25	24,375	22	1,100,000
X	21.5	24,200	29	28,275	26	1,300,000
Y	25.5	28,700	34	33,150	30	1,500,000
Z	31	34,875	41	39,975	36	1,800,000

Table: Drive Performance by Chassis Code, Smaller Chassis

Drive/Chassis	1	2	3	4	5	6	7	8	9	A	B	C
A	4	1	0	—	—	—	—	—	—	—	—	—
B	—	4	2	1	1	0	—	—	—	—	—	—
C	—	6	3	2	1	0	—	—	—	—	—	—
D	—	—	5	3	2	1	0	0	—	—	—	—
E	—	—	—	6	4	2	1	1	0	0	0	0
F	—	—	—	—	6	3	2	1	1	1	0	0
G	—	—	—	—	—	4	2	2	1	1	1	1
H	—	—	—	—	—	5	3	2	2	1	1	1
J	—	—	—	—	—	6	4	3	2	2	1	1
K	—	—	—	—	—	—	5	3	3	2	2	1
L	—	—	—	—	—	—	5	4	3	2	2	2
M	—	—	—	—	—	—	6	5	4	3	2	2
N	—	—	—	—	—	—	—	6	5	4	3	3
P	—	—	—	—	—	—	—	—	5	4	4	3
Q	—	—	—	—	—	—	—	—	6	5	4	4
R	—	—	—	—	—	—	—	—	—	6	5	4
S	—	—	—	—	—	—	—	—	—	6	5	5
T	—	—	—	—	—	—	—	—	—	—	6	5
U	—	—	—	—	—	—	—	—	—	—	—	6
V	—	—	—	—	—	—	—	—	—	—	—	—
W	—	—	—	—	—	—	—	—	—	—	—	—
X	—	—	—	—	—	—	—	—	—	—	—	—
Y	—	—	—	—	—	—	—	—	—	—	—	—
Z	—	—	—	—	—	—	—	—	—	—	—	—

Table: Drive Performance by Chassis Code, Larger Chassis

Drive/Chassis	D	E	F	G	H	J	K	L	M	N	P	Q
A	—	—	—	—	—	—	—	—	—	—	—	—
B	—	—	—	—	—	—	—	—	—	—	—	—
C	—	—	—	—	—	—	—	—	—	—	—	—
D	—	—	—	—	—	—	—	—	—	—	—	—
E	—	—	—	—	—	—	—	—	—	—	—	—
F	0	0	0	0	—	—	—	—	—	—	—	—
G	0	0	0	0	0	0	0	0	—	—	—	—
H	1	1	0	0	0	0	0	0	0	0	0	0
J	1	1	1	1	1	0	0	0	0	0	0	0
K	1	1	1	1	1	1	1	0	0	0	0	0
L	1	1	1	1	1	1	1	1	1	0	0	0
M	2	2	1	1	1	1	1	1	1	1	1	1
N	2	2	2	2	2	1	1	1	1	1	1	1
P	3	2	2	2	2	2	1	1	1	1	1	1
Q	3	3	3	2	2	2	2	2	1	1	1	1
R	4	3	3	3	2	2	2	2	2	2	2	1
S	4	4	3	3	3	2	2	2	2	2	2	2
T	5	4	4	3	3	3	3	2	2	2	2	2
U	5	5	4	4	4	3	3	3	3	2	2	2
V	6	6	5	5	4	4	4	3	3	3	3	3
W	—	—	6	6	5	5	4	4	4	4	3	3
X	—	—	—	—	6	6	5	5	5	4	4	4
Y	—	—	—	—	—	—	6	6	5	5	5	5
Z	—	—	—	—	—	—	—	—	—	6	6	6

Table: Vehicle Base Speed by Drive Performance

Propulsion Type	TL	1	2	3	4	5	6
Rails	3	40	80	120	160	200	240
Screw Propeller	3	20	40	60	80	100	120
Airship	4	30	60	90	120	150	180
Rotor (Horizontally Mounted)	4	100	200	300	400	500	600
Rotor (Vertically Mounted)	4	50	100	150	200	250	300
Tracks	4	25	50	75	100	125	150
Wheels	4	50	100	150	200	250	300
Jet	5	150	300	450	600	750	900
Mole (*measured in meters/hour)	5	50*	100*	150*	200*	250*	300*
Air Cushion	7	50	100	150	200	250	300
Hypersonic	8	300	600	900	1200	1500	1800
Legs	8	50	100	150	200	250	300
Grav	9	100	200	300	400	500	600
Advanced Grav	12	200	400	600	800	1000	1200
Extreme Grav	15	400	800	1200	1600	2000	2400

Vehicle Fuel

Every vehicle carries fuel, unless it derives its power from an external source. All fuel calculations are calculated based on the power plant's Drive Code and Power Plant Type, as well as the expected period of operation without refueling. The power plant fuel requirements for early fusion engines are outlined in the **Vehicle Power Plant Fuel Requirements** table. Fuel consumption for other power plant types is detailed in the Vehicle Fuel Consumption by Power Plant Type table.

The amount of fuel required by the power plant depends on the volume of the power plant itself, and is calculated as one-third of the power plant tonnage per week. Vehicles are designed to operate for a variety of durations, ranging from a few hours to days or even weeks. For your convenience, the **Vehicle Power Plant Fuel Requirements** table provides calculated values for the fuel per week, per day and per hour, by Drive Code.

For purposes of describing fuel volume in a vehicle's description, assume that the number of spaces of fuel is equivalent to the kiloliters of volume it occupies. Divide calculated fuel space by 12 to determine fuel volume in tons.

Range and Cruising Speed: The amount of fuel a vehicle carries determines its Range at its maximum speed. The cruising speed of a vehicle is assumed to be 75% of the vehicle's maximum speed and if the vehicle maintains this rate of movement, its Range will increase by 50% due to fuel efficiency.

Table: Power Plant Fuel Requirements

Drive Code	Spaces	Fuel/Wk (Spaces)	Fuel/Dy (Spaces)	Fuel/Hr (Spaces)
A	0.11	0.03	0.0043	0.00018
B	0.26	0.09	0.012	0.00052
C	0.4	0.13	0.019	0.00077
D	0.75	0.25	0.036	0.0015
E	1.25	0.41	0.059	0.0024
F	1.75	0.58	0.083	0.0035
G	2.25	0.75	0.11	0.0047
H	2.75	0.91	0.13	0.0054
J	3.5	1.16	0.17	0.0069
K	4	1.33	0.19	0.0079
L	4.5	1.50	0.21	0.0089
M	5.25	1.75	0.25	0.010
N	6.75	2.25	0.32	0.013
P	7.5	2.50	0.36	0.015
Q	8.5	2.83	0.40	0.017
R	9.5	3.16	0.45	0.019
S	10.5	3.50	0.50	0.021
T	12	4.00	0.57	0.024
U	13.5	4.50	0.64	0.027
V	15.5	5.16	0.73	0.031
W	18.5	6.16	0.88	0.037
X	21.5	7.16	1.02	0.043
Y	25.5	8.50	1.21	0.051
Z	31	10.33	1.48	0.061

Table: Vehicle Fuel Consumption by Power Plant Type

Power Plant Type	TL	Fuel Mod	Price/Space (Cr)	Notes
External Combustion	3	x9 (wood) or x5 (coal)	540	Starting at TL5, can use hydrocarbons to generate steam (x3).
Internal Combustion	5	x3	830	
Fission	6	x0.04	8,300	
Fuel Cell (Closed)	7	x20	40	Does not require an external source of oxygen
Fuel Cell (Open)	7	x2	40	Requires an external source of oxygen
Gas Turbine	7	x3	830	
Early Fusion	9	x1	40	
Fusion	12	X0.75	40	
Advanced Fusion	15	x0.5	40	
Antimatter	17	x0	Special	Must be refueled once a month, at a cost of Cr40 per Space of Antimatter power plant.

Vehicle Drive Options

The following options are available as modifications on Vehicle Drives.

Additional Drive Systems: A secondary drive system can be installed in a vehicle by purchasing a second propulsion drive. The secondary drive system's performance is limited to one less than that of the primary drive system. The vehicle's Agility suffers a–1 penalty due to design accommodations required to support the additional drive system.

Decreased Agility: Vehicles can be built with lowered Agility, normally done for reasons of cost. Each reduction of –1 Agility reduces the final price of the vehicle by 25% of its chassis price. The maximum decrease to a vehicle's Agility is -2.

Decreased Fuel Efficiency: Vehicles can be built with decreased fuel efficiency, relying on cheaper parts or less efficient engines to cut costs. Fuel inefficient vehicles multiply the Fuel Mod on the Vehicle Fuel Consumption by Power Plant Type by 1.25 (increasing the fuel consumed by 25%). This reduces the final price of the vehicle by 10% of its chassis price.

Extra Leg(s): Walkers are typically assumed to have two legs. Additional legs can also be added to improve mobility in rough and uneven terrain. Each additional legs costs 25% of the vehicle's Contact-Based Drive Price and takes up an additional 5% of the vehicle's Contact-Based Drive Space. Every pair of additional legs reduces any terrain-based maneuver penalties by 1. This cannot be used to provide a bonus, only to negate a penalty. In addition, any walker with four or more legs gains a DM+1 on attack rolls made with the vehicle's weapons.

Extra Pair of Wheels: Wheeled vehicles are typically assumed to have four wheels (except for small vehicles of 0.5 tons or less in size, which may have two wheels at the designer's discretion.) Additional wheels can be added to improve cross-country mobility. Each additional pair of wheels costs 25% of the vehicle's Contact-Based Drive Price, takes up 25% of the vehicle's Contact-Based Drive Space, and reduces any terrain-based Agility penalties by 1. This cannot be used to provide a bonus, only to negate a penalty.

Increased Agility: Each +1 to Agility costs 50% of the chassis price. The maximum increase to a vehicle's Agility is +3.

Increased Fuel Efficiency: Vehicles can be built with increased fuel efficiency. Fuel efficient vehicles multiply the Fuel Mod on the Vehicle Fuel Consumption by Power Plant Type by 0.9 (reducing the fuel consumed by 10%). This costs 20% of the chassis price.

Jump Jets: Any ground vehicle or hovercraft can be built with Jump Jets. These vehicles use jump jets primarily for crossing obstacles, but jump jets can also be used to allow the vehicle to fly, albeit inefficiently and no higher than 100 meters off the surface. To determine the size and cost of the Jump Jets unit, select a Thrust-based Drive that provides a minimum Drive Performance of 1 from the **Vehicle Drive Costs** table, and multiply both Spaces and Price by 0.75. When flying through the use of jump jets, the vehicles moves at one-quarter of the Base Speed for the Jump Jets unit, and consumes fuel five times faster than normal.

Off-Road Capability: Any ground vehicle can be purposefully designed for off-road use. This modification costs 50% of the vehicle's Contact-Based Drive Price, and the vehicle's Base Speed is lowered by 10%. A vehicle that is off-road capable does not suffer the –2 DM to Agility for moving off-road, and its Speed is not reduced. In addition, it can cross rough terrain with a –2 DM to Agility.

Tilt Rotors/Jets: Aircraft equipped with tilt rotors gain the ability to takeoff vertically and hover like a helicopter. Once the rotors or jets rotate forward, the aircraft flies normally. Adding this component triples the Price of the Thrust-based drive.

Vehicle Agility

Some vehicles are easier to drive than others. A vehicle's Agility rating reflects how easy the vehicle is to drive, and is expressed as a DM to the pilot's skill check. A vehicle's base Agility is determined by a number of factors, including the size of the vehicle's chassis and its primary propulsion type. To determine a vehicle's Agility rating, consult the Vehicle Agility Modifiers table, and sum up all appropriate modifiers.

Table: Vehicle Agility Modifiers

Agility Factor	Modifier
Vehicle Type	--
Airplane	-2
Airship	-4
Grav Vehicle	+0
Helicopter	-1
Hovercraft	+0
Hypersonic	-2
Jet	-1
Mole	-4
Motorboat	+1
Ocean Ship	-2
Sailing Ship	-2
Submarine	-2
Tracked Ground Vehicle	-1
Train	-2
Walker	+1
Wheeled Ground Vehicle	+2
Size and Power Factors	--
Animal-Powered	-2
Wind-Powered	-1
Small (2- tons)	+1
Large (10+ tons)	-1
Huge (20+ tons)	-2
Gargantuan (100+ tons)	-3

Vehicle Controls

Unlike starships, vehicles do not have bridges. Instead, vehicles require a control system to allow crewmembers to control the vehicle. More advanced systems can be installed. Unmanned vehicles use drone controller systems to allow for remote operation of the vehicle.

Primitive Controls (TL 2): Primitive controls reflect the crudest of methods used to direct the motion of a vehicle.

Basic Controls (TL 4): This is the default control set-up, usually some form of basic steering mechanism and a throttle for controlling speed.

Advanced Controls (TL 8): This is usually advanced drive-by-wire systems with heads-up displays.

Exo-skeleton Linkage (TL 10): The exo-link is a system for translating body movements into vehicle actions. No additional special equipment or cybernetic modifications are required.

Neural Link (TL 12): The neural link is a true mind-machine linkage and allows an operator to control the vehicle with their mind alone. No additional special equipment or cybernetic modifications are required.

Table: Vehicle Control Systems

Interface	TL	Spaces	Price (Cr)	Agility	Initiative	Notes
Primitive	1	0.5	-20% Chassis price	-1	0	DM-2 at speeds over 50 kph.
Basic	4	1	--	0	0	Included in Chassis price.
Advanced	8	2	Cr10,000	+1	0	
Exo-Skeleton Linkage	10	3	Cr100,000	+1	+1	
Neural-linked	12	4	Cr200,000	+2	+2	

Table: Vehicle Drone Controllers, By Interface

Interface	TL	Spaces	Price (Cr)	Control DM	Range
Primitive	5	0.5	Cr10,000	-3	Long
Basic	7	1	Cr50,000	-2	Very Long
Advanced	9	2	Cr100,000	-1	Distant
Exo-Skeleton Linkage	11	3	Cr200,000	0	Very Distant
Neural-linked	13	4	Cr500,000	+1	Regional

Robot Brains

Robot Brains can be added to any vehicle with Advanced Controls or better.

Table: Robot Brains

CPU	Spaces	TL	Computer Equivalent	Max Skill Level	Price
Linear	3	8	Model 1	1	Cr22,500
Parallel	2	10	Model 2	2	Cr40,000
Synaptic	1	12	Model 3	3	Cr90,000

Cyborg Controls

The use of human (or sometimes animal) brains to control a vehicle is possible at TL12 and higher. The organic brain and its support systems take up one Space in the vehicle, and require Neural-linked Controls. The use of an organic core grants a +1 DM to all skill checks performed by the cyborg vehicle, in addition to the benefits of the neural link. An organic brain costs Cr250,000 and otherwise operates as an independent entity. It includes basic life support for the organic components for a period of one month.

Organic Core Extended Life Support : An Organic Core Extended Life Support provides a year's worth of nutrients and filtration for the organic brain and its biological support systems. It is available at TL 13, takes up 5 Spaces, and costs Cr250,000.

Vehicle Control Options

The following option is available as a modification on Vehicle Controls.

Autopilot: Autopilots are available for aircraft and sea vessels starting at TL 5 and ground vehicles at TL 9. Autopilot systems are at skill level 0 at their Tech Level of introduction and increase their skill level by 1 for every two Tech Levels thereafter, to a maximum of 3. Autopilots cost Cr2,000 + Cr5,000 per skill level.

Vehicle Communication Systems

Installing a communication system allows the crew to interact with others. The following systems are assumed to use radio for communications. Alternate approaches to communication are covered in the Alternative Communicator Types table. Vehicle communication systems are optional, but often highly recommended, particularly for military vehicles.

Table: Vehicle Communication Systems

Communication System	TL	Spaces	Price (Cr)	Range
Class I	5	0.01	Cr500	Distant (5 km)
Class II	5	0.02	Cr1.000	Very Distant (50 km)
Class III	6	0.05	Cr2,000	Regional (500 km)
Class IV	8	0.10	Cr4,000	Continental (5000 km)

Table: Alternative Communicator Types

Type	TL	Space Mod	Price Mod	Notes
Laser	8	x2	x3	Requires clear line of sight between communicators
Maser	10	x4	x6	Works like lasers, but can cut through smoke and aerosols
Meson	11	x10	x50	Cannot be jammed or blocked, but cannot be used while moving

Vehicle Sensors

Vehicle sensors allow the crew to identify, track and jam other vehicles. These sensor systems operate similarly to those installed on a starship or small craft. The type of sensor package installed can impose a DM on Comms skill checks when using the system to perform sensor-related tasks. Vehicle sensor systems are optional, but often highly recommended, particularly for military vehicles.

Underwater Sensors: Sensor packages intended for use underwater must be purchased separately. Surface sensors cannot be used underwater, and vice versa. Underwater sensors cost the same as standard vehicle sensors, but require an additional 12 Spaces, and the Max Range drops by one category, to a minimum of Very Long (500m).

Table: Standard Vehicle Sensors

Sensors	TL	Spaces	Price (Cr)	Comms DM	Max Range	Includes
Standard	8	3	Cr5,000	–4	Very Long (500m)	Radar, Lidar
Basic Civilian	9	6	Cr10,000	–2	Distant (5 km)	Radar, Lidar
Basic Military	10	12	Cr20,000	+0	Very Distant (50 km)	Radar, Lidar, Jammers
Advanced	11	18	Cr50,000	+1	Regional (500 km)	Radar, Lidar, Densitometer, Jammers
Very Advanced	12	30	Cr100,000	+2	Continental (5000 km)	Radar, Lidar, Densitometer, Jammers, Neural Activity Sensor

Radar/Lidar detects physical objects. It can be active or passive. If a vehicle is using active sensors, it is easier to detect (+2 DM to Comms checks) but detects more about its surroundings.

Jammers can jam or counter-jam radio communications and sensor locks.

Densitometers can determine the internal structure and makeup of an object.

Neural Activity Sensor detects neural activity and intelligence.

Vehicle Computer

The vehicle computer is identified by its model number; the Vehicle Computer Models table indicates details of price, rating, and tech level available. The Model number is the computer rating, which determines the power of a computer. Rating measures the complexity of the programs a computer can run. (Storage space is effectively unlimited at TL 9 and above.) Programs are rated by the computer rating they require. A system can run a number of programs up to its rating, minimum of one (for Model 0 computers). Vehicle computers are optional, but often highly recommended at higher tech levels.

Vehicle Software: Vehicle computers can run any of the software listed in **Chapter 4: Equipment** of the ***Cepheus Engine*** core rules.

Table: Vehicle Computer Models

Computer	TL	Space	Price (Cr)
Model 0	7	0.02	Cr100
Model 1	8	0.01	Cr500
Model 2	10	0	Cr1,000
Model 3	12	0	Cr2,000
Model 4	13	0	Cr3,000
Model 5	14	0	Cr10,000

Vehicle Computer Options

The following option is available for vehicle computers.

Hardened Systems (fib): A computer and its connections can be hardened against attack by electromagnetic pulse weapons. A hardened system is immune to EMP, but costs 50% more.

Vehicle Crew & Passengers

All vehicles require a crew to operate and maintain the vehicle. For civilian vehicles, that is typically one operator or driver. Military vehicles also require one gunner per weapon and one commander if three or more crew members are required. Every vehicle requires at least a basic cockpit or a basic control cabin to interface with the vehicle's control, communication and sensor systems.

For vehicles intended for only a few waking hours, short-term accommodations are suggested for crew and passengers. If a vehicle is intended for use over several days or longer, long-term accommodations would be a better design implementation.

Sailing Vessels: Sailing vessels calculate vehicle crew differently. Subtract the Tech Level of the sailboat from 10 (minimum 1) to determine the number of crew needed to work the sails for every four tons of sailing vessel or portion thereof. Sailing vessels of two tons or less require half this amount.

Table: Vehicle Accommodations

Accommodation	Duration	Spaces	Price (Cr)	Notes
Bunk, Military	Long	24	Cr100,000	Supports one non-crew cramped (military only)
Control Cabin, Basic	Long	36	Cr10,000	Supports one crew
Control Cabin, Extended	Long	18	Cr5,000	Supports one additional person
Control Cabin, Standard	Long	72	Cr20,000	Supports two crew plus one additional person
Low Berth	Long	6	Cr50,000	Holds one person
Stateroom, Economy	Long	24	Cr250,000	Supports one person cramped
Stateroom, Elite	Long	72	Cr750,000	Supports two people comfortably
Stateroom, Standard	Long	48	Cr500,000	Supports two people cramped, one comfortably
Cockpit, Basic	Short	2	Cr1,000	Supports one crew
Cockpit, Extended	Short	4	Cr2,000	Supports two crew
Seat, Cramped	Short	4	Cr2,000	Supports three people cramped
Seat, Standard	Short	2	Cr1,000	Supports one person

Life Support

Some vehicles provide differing levels of life support. Basic life support is free for submersibles and vehicles with Hostile Environmental Protection.

Table: Life Support

Life Support Type	TL	Spaces	Price/Space (Cr)	Notes
Basic	4	3 per 20 people	Cr3,500	Good for 10 days
Extended	7	3 per 5 people	Cr17,500	Good for 90 days

Additional Vehicle Components

The following are examples of additional vehicle components that might prove useful for certain vehicle designs.

Airlock (TL 6)

Airlocks take up 12 Spaces each and cost Cr200,000. If a craft does not have an airlock, then the crew cannot leave the craft without opening the vehicle up to the outside environment, which can be dangerous in a vacuum or underwater.

Autodoc (TL 12)

The Autodoc is a whole-body automated treatment system that is detailed in the ***Cepheus Engine*** core rules. The Autodoc takes up 6 Spaces and costs Cr40,000.

Cargo Arm (TL 8)

This is a heavy-duty manipulator arm used for lifting cargo in confined spaces. Cargo Arms have a base Strength score of 30 and a Dexterity of 0, occupy 1 space and cost Cr50,000.

Cargo Hold (TL 1)

The design plan must indicate cargo capacity. There is no price but cargo carried may not exceed cargo capacity. Any Spaces left over after all systems have been installed may be allocated to cargo space. Divide the remaining Spaces by 12 to determine the volume of the cargo hold in displacement tons.

Cargo Trailer (TL 1)

Ground vehicles can be equipped to tow a cargo trailer. Vehicles pulling a cargo trailer suffer a -1 penalty to Agility; vehicles of two displacement tons or smaller suffer an additional -1 penalty to Agility. The **Cargo Trailer**

by Size table describes the price and capacity (in Spaces) for each trailer type. A vehicle's Towing Speed is equal to their Base Speed without the trailer attached, multiplied by the ratio of the vehicle's chassis (in Spaces) divided by the sum of the vehicle's chassis and the cargo trailer's capacity (both in Spaces). Towing Speeds are rounded down to the nearest multiple of 10kph.

Table: Cargo Trailer by Size

Trailer Size	Price (Cr)	Capacity (Spaces)	Description
0.25-Ton	1,450	3	Light
0.5-Ton	1,700	6	Moving, Standard
1-Ton	2,200	12	Moving, Large
2-Ton	3,200	24	Light Duty, Standard
4-Ton	5,700	48	Light Duty, Large
8-Ton	12,000	96	Commercial, Standard

Crane (TL 4)
Cranes are machines generally equipped with a hoist rope, wire ropes or chains, and sheaves, that can be used both to lift and lower materials and to move them horizontally.
Light Crane: Light Cranes can lift up to 400 kg and can be used as rescue equipment. Light cranes cost Cr2,500 and take up 3 Spaces.
Medium Crane: Medium Cranes can lift up to 2,000 kg. They cost Cr40,000, and take up 12 Spaces.
Heavy Crane: Heavy Cranes can lift up to 10,000 kg. They cost Cr100,000 and take up 24 Spaces.

Cutting Equipment (TL 5)
Cutting equipment includes external heavy duty saws, water knives or plasma cutters, depending on Tech Level. The equipment costs Cr10,000 and takes up 15 Spaces.

Detention Cells (TL 3)
Found primarily on military and government vessels, a detention cell is used to keep prisoners. A detention cell holds one prisoner in extremely cramped conditions, displaces 12 Spaces and costs Cr125,000.

Digging Equipment (TL 5)
Digging equipment includes external digging and scooping equipment. This equipment costs Cr25,000 and takes up 30 Spaces.

Ejection Seat (TL 5)
The ejection seat takes up 2 Spaces and is designed to blast the occupant clear of the moving vehicle. At lower Tech Level this means a suitable height to open a parachute but at higher Tech Levels it is merely sufficient to get clear of the vehicle until a grav chute can deploy. An ejection seat costs Cr5,000.

Emergency Low Berth (TL 12)
A conventional Low Berth takes several minutes to induce hibernation and lower core temperature. The Emergency Low Berth can do a 'crash' induction, plunging a person into deep hibernation in a fraction of the time. It can hold people, takes up 12 Spaces, and costs Cr100,000.

Entertainment System (TL 5)
Supporting both audio and visual entertainment, this system takes up no Space, and costs at least Cr200. Players intending to impress may want to spend more. Much more.

Fire Extinguishers (TL 4)
Fire Extinguishers are designed to put out fires internal to the vehicle. They take up no Space and cost Cr500. Starting at TL8, worlds with a Law Level of 6 or higher may require that these be installed on every civilian vehicle.

Floats/Pontoons (TL 3)
This allows the aircraft the ability to land and take-off from water. This is a removable component and can be added at any time. It costs Cr250 and one Space per 12 Spaces (one displacement ton) of the aircraft's chassis, reduces Base Speed by 10% and reduces Agility by 1.

Folding Wings/Rotors (TL 3)
Aircraft can be designed with folding wings and/or rotors to allow them to be stored more efficiently. It costs Cr600 per 12 Spaces (one displacement ton) of the aircraft's chassis, and reduces the size of the aircraft by 25% when storing the vessel.

Fresher (TL 7)
A Fresher, complete with toilet, sink and shower, takes up 6 Spaces and costs Cr1,500. Freshers are automatically included as part of any stateroom.

Galley (TL 3)
A Mini-galley takes up 6 Spaces, serves up to five people and costs Cr1,000. A Full Galley take up 18 Spaces, plus 3 Spaces per 10 people served. It costs Cr2,000 plus Cr500 per person served.

General Purpose Lab (TL 7)
A General Purpose Lab provides no bonuses but allows tasks to be performed with no penalty for missing tools/equipment. General Purpose Lab units consume 6 Spaces per researcher using the lab and cost Cr10,000 per lab unit.

Holding Tank (TL 8)
Holding tanks can be built to any size, at the price of Cr1,500 per Space. Holding tanks can be designed to carry liquids or gases, which is determined at the time of installation.

Holo-Suite (TL10)
This is advanced holographic projection suite. Often used on exploration vehicles as a large display unit, it has other, less wholesome, uses. It takes up 3 Spaces and costs Cr15,000.

Hot Tub/Pool (TL 6)
This takes up a minimum of one Space per person capacity and costs Cr3,000 per Space.

Liquid Cannon (TL 4)
Liquid Cannons are used for fire suppression, riot control and dispersal of chemicals. A liquid cannon costs Cr2,000, takes up 3 Spaces and requires 3 Spaces per minute's firing duration of liquid carried. A liquid cannon has a maximum range of Medium.

Manipulator Arms (TL 5)
Manipulator Arms are remote appendages with claws or hands. Manipulator arms vary in Strength and Dexterity. Arms have a Strength of 2 and a Dexterity of 1, with a price of Cr10,000. Increasing Strength or

Dexterity costs Cr5,000 per point, to the maximum indicated in the table below. Manipulator arms do not take up space in the chassis.

Table: Manipulator Arm Maximums, By Tech Level

TL	Max Str	Max Dex
5	6	4
8	12	8
11	18	12
14	24	16

Nuclear Damper (TL 12)
The nuclear damper projects a wave that modifies the strong nuclear force and can thus either prevent nuclear weapons from operating or else detonate them prematurely. They cannot detonate weapons stored in damper boxes, however. It takes up 12 Spaces and costs Cr500,000.

Operating Theater (TL 5)
An Operating Theater is a room equipped for use as an emergency medical clinic. Until TL 10, the vehicle must remain stationary in order for the Operating Theatre to be used. After that, the theatre can be built on a stabilized bed that allows it to be used while the vehicle is in motion. An operating theater consumes 12 Spaces plus 9 Spaces per patient. It costs Cr1,500 per Space used. An operating theater can serve as a mobile sickbay or hospital for surgery and medical care, as detailed under **Medical Treatment** in **Chapter 5: Personal Combat** in the ***Cepheus Engine SRD***.

Refrigeration (TL 5)
Refrigeration units take up one Space for every 10 Spaces that are to be refrigerated. This costs Cr250 per Space. This is typically applied to Cargo Holds or Cargo Trailers, when needed.

Refueling Station (TL 9)
The refueling station is designed to turn water into hydrogen fuel, using the sun as a power source. It requires a significant amount of space, and access to both water and sun. At TL 9, it requires one hour per 3 Spaces of the vehicle's chassis to crack sufficient fuel to completely refuel the vehicle (assuming it uses hydrogen). At TL 12 this is reduced to one hour per 12 Spaces of the vehicle's chassis. Refueling stations require 12 Spaces plus 1 Space per 50 tons of vessel to be refueled. They cost Cr15,000 per space.

Research Lab Space (TL 9)
Lab Space includes analytic equipment, computer workstations and equipment appropriate to the discipline it is focused on, defined during construction. Lab Space grants a skill DM equal to +1, +2 or +3 and take up 3 Spaces per bonus per researcher using it. A +3 DM lab, used by 3 researchers, would take up 27 Spaces. Price is Cr10,000 per 3 Spaces used. Types of lab include: Physics, chemistry, biology, psychology, structures and materials. Other types are possible.

Survey Sampling Equipment (TL 5)
This covers several different types of equipment that act to sample atmosphere, ground and any water or other fluids.

- **Atmosphere Sampler**: A system of collectors, pipes and filters for atmosphere sampling, including any particulates, taints and organic matter. It takes up 9 Spaces and costs Cr10,000.

- **Geology Sampler**: An array of scooping devices for shallow ground testing along with a hollow-core drills capable of drilling down one kilometer. It takes up 45 Spaces and costs Cr100,000. Geology Samplers add a +1 DM to all geology-based checks at TL 10 and a +2 DM at TL 14.
- **Hydrology Sampler**: This is a set of liquid sampling equipment, holding tanks and testing equipment. It costs Cr10,000, and takes up 15 Spaces. Hydrology Samplers add a +1 DM to all hydology-based checks at TL 10 and a +2 DM at TL 14.

Wet Bar (TL 2)

A basic wet bar, usually species-specific. It takes up 1.5 Spaces and costs Cr2,000.

Table: Additional Vehicle Components

Component	TL	Spaces	Price (Cr)
Cargo Hold	1	--	--
Cargo Trailer	1	See description	See description
Wet Bar	2	1.5	Cr2,000
Detention Cells	3	12	Cr125,000
Floats/Pontoons	3	See description	See description
Galley	3	6	Cr1,000
Galley, Full	3	See description	See description
Crane, Heavy	4	24	Cr100,000
Crane, Light	4	3	Cr2,500
Crane, Medium	4	12	Cr40,000
Fire Extinguishers	4	0	Cr500
Liquid Cannon	4	3	Cr2,000
Cutting Equipment	5	15	Cr10,000
Digging Equipment	5	30	Cr25,000
Ejection Seat	5	2	Cr5,000
Entertainment System	5	0	Cr200
Manipulator Arms	5	See description	See description
Operating Theater	5	See description	See description
Refrigeration	5	1 per 10 Spaces refrigerated	Cr250 per Space
Survey Sampling Equipment, Atmosphere Sampler	5	9	Cr10,000
Survey Sampling Equipment, Geology Sampler	5	45	Cr100,000
Survey Sampling Equipment, Hydrology Sampler	5	15	Cr10,000
Airlock	6	12	Cr200,000
Hot Tub/Pool	6	1 per person	Cr3,000 per Space
Fresher	7	6	Cr1,500
General Purpose Lab	7	6	Cr10,000
Cargo Arm	8	1	Cr50,000
Holding Tank	8	By size	Cr1,500 per Space
Refueling Station	9	See description	See description
Research Lab Space	9	See description	See description
Holo-Suite	10	3	Cr15,000
Autodoc	12	6	Cr40,000
Emergency Low Berth	12	12	Cr100,000
Nuclear Damper	12	12	Cr500,000

Vehicle Armaments

Military vehicles, as well as civilian vehicles in certain star systems, often carry weapons. Vehicles carry weapons in one of four ways: gun ports, weapon mounts, vehicular turrets, and ordinance bays.

Gun Ports

Gun ports are mounts for small arms. Gun ports cost Cr250 each, and require no Spaces. Gun Ports are used at Personal Weapon Ranges only, and do not benefit from stabilization or fire control. Gun Ports do not require a vehicle weapon point (see Weapon Mount, below). A gun port allows the gunner to benefit from the vehicle's armor, except when the attacker is adjacent to the gun port itself.

Table: Gun Port Weapons

Weapon	TL	Price (Cr)	Spaces	RoF	Range	Dmg	Recoil	LL
Revolver	4	Cr150	0.01	1	ranged (pistol)	2D6	Yes	6
Auto Pistol	5	Cr200	0.01	1	ranged (pistol)	2D6	Yes	6
Carbine	5	Cr200	0.04	1	ranged (shotgun)	2D6	Yes	6
Rifle	5	Cr200	0.05	1	ranged (rifle)	3D6	Yes	6
Shotgun	5	Cr150	0.05	1	ranged (shotgun)	4D6	Yes	7
Submachinegun	5	Cr500	0.03	0/4	ranged (assault wpn)	2D6	Yes	4
Auto Rifle	6	Cr1,000	0.06	1/4	ranged (rifle)	3D6	Yes	6
Assault Rifle	7	Cr300	0.04	1/4	ranged (assault wpn)	3D6	Yes	4
Body Pistol	7	Cr500	0.01	1	ranged (pistol)	2D6	Yes	1
Grenade Launcher	7	Cr400	0.07	1	ranged (shotgun)	By grenade	Yes	3
Rocket Launcher	7	Cr2,000	0.07	1	ranged (rocket)	4D6	No	3
Laser Carbine	8	Cr2,500	0.06	1	ranged (pistol)	4D6	No	2
RAM Grenade Launcher	8	Cr800	0.07	1/3	ranged (assault wpn)	By grenade	Yes	3
Snub Pistol	8	Cr150	0.01	1	ranged (pistol)	2D6	No	6
Accelerator Rifle	9	Cr900	0.03	1/3	ranged (rifle)	3D6	No	6
Laser Rifle	9	Cr3,500	0.07	1	ranged (rifle)	5D6	No	2
Advanced Combat Rifle	10	Cr1,000	0.04	1/4	ranged (rifle)	3D6	Yes	6
Armor Rifle, Man Portable (ARMP)	10	Cr10,000	0.18	1/4	ranged (rocket)	10D6	Yes	3
Gauss Rifle	12	Cr1,500	0.04	1/4/10	ranged (rifle)	4D6	No	6
Laser Pistol	12	Cr1,000	0.02	1	ranged (pistol)	4D6	No	2
Plasma Gun, Man Portable (PGMP)	12	Cr20,000	0.12	1/4	ranged (rifle)	10D6	Yes	2
Stagger Laser	12	Cr7,500	0.11	1/4	ranged (assault wpn)	5D6	No	2
Magrail Rifle	13	Cr2,200	0.05	1/4	ranged (rifle)	5D6	No	6
Fusion Gun, Man Portable (FGMP)	14	Cr100,000	0.14	1/4	ranged (rifle)	16D6	Yes	2

Weapon Mounts

A **weapon point** is a location on a vessel or vehicle designed to carry an external or internal load. A vehicle's chassis or a vessel's hull can support one weapon point per 5 tons, with a minimum of one. For example, a two-ton vehicle has one weapon point, while a ten-ton vehicle would have two weapon points, and an 800-ton naval destroyer has 160 weapon points.

Weapon mounts come in three varieties: fixed, ring and pintle. A fixed mount is permanently affixed to the chassis, and cannot move or be removed. A pintle mount is effectively a post upon which the weapon is affixed, and the weapon pivots on the point of attachment to aim and fire. A ring mount is effectively a ring of metal that serves as the track upon which the weapon traverses as the weapon is aimed and fired.

A weapon mount may be attached to an open weapon point on the vehicle, and a weapon point may only support one weapon mount. Weapon mounts do not offer any sort of fire control. Weapon mounts do not take up any Spaces themselves, nor do they add any extra Spaces to a vehicle. Weapons in a weapon mount still count against the available Spaces in a vehicle.

Fixed Mount weapons cannot move, and so are limited to firing in one direction (normally straight ahead). A fixed mount has no price and must simply be noted at time of construction.

Gun Shields: Both pintle and ring mounts can be equipped with gun shields, which provide the gunner with Armor equal to half the tech level of the vehicle rounded down, minimum of one, in the direction the weapon is facing.

The **Weapon Mounts** table describes the various weapon mounts and modifications available in the Vehicle Design System. Each column is described as follows:

TL: The minimum tech level required to manufacture such an item.

Price: Price of this weapon mount in Credits (Cr).

Max Spaces: The maximum size of a weapon, in Spaces, that this weapon mount can carry.

Stabilized: Indicates if the mount is stabilized and so does not suffer a penalty to fire while moving.

Table: Weapon Mounts

Mount Type	TL	Price (Cr)	Max Spaces	Stabilized
Fixed	1	0	--	--
Pintle	4	500	1.5	N
Ring	4	750	1.5	N
Pintle, Powered	7	1,500	3	Y
Ring, Powered	7	2,150	3	Y
Gun Shield	--	200 per point of Armor granted	--	--

Vehicle Turrets

Vehicle turrets come in two varieties: small and large. A vehicle turret takes up one weapon point per 60 Spaces in size, or fraction thereof, of the turret itself. A small turret is only big enough to fit the weapon installed, and is remotely controlled from within the vehicle, while a large turret holds both the installed weapon and its operator. Vehicle turrets can also represent gun pods and other housing for larger weapons on vehicles.

Coaxial (or Paraxial) Mounts: Multiple weapons can be mounted in the same turret. All weapons mounted in the same turret have the same firing arc. Such turrets consume an additional weapon point per additional weapon beyond the first. This is in addition to the standard allocation of one weapon point per 60 Spaces in size, or fraction thereof, of the turret itself.

Pop-Up is a quality that can be applied to any type of turret – the turret is concealed in a pod or recess on the hull, and is detectable only when deployed. A ship with all its weapons in pop-up turrets looks unarmed to a casual sensor scan.

Table: Vehicle Turrets

Turret Type	Spaces	Price (Cr)
Small	0.5, plus weapon volume in Spaces	Cr8,000 per Space
Large	3, plus weapon volume in Spaces	Cr16,000 per Space
Pop-Up	Base x2	As base, plus additional Cr4,000 per Space

Vehicular Weapons

The following are common vehicular weapons, primarily those used for vehicular turrets. Each column is described as follows:
TL: The minimum tech level required to manufacture such an item.
Price: Price of this weapon in Credits (Cr).
Spaces: Number of Spaces this weapon occupies.
RoF: Rate of Fire. The number of rounds that may be fired during a significant action in the format: Single Shot / Burst Shot / Automatic Fire.
Range: The range category for this weapon.
Dmg: The damage a weapon inflicts.
Radius: The distance from the target point that damage is still dealt.
Recoil: Lists if the weapon has recoil when fired.
LL: The Law Level where the weapon first becomes illegal.

Special Weapon Rules

Several types of weapons have their own rules.

- **Disintegrators**: The Effect used with a disintegrator is not determined by the attack roll; instead it is equal to the Armor rating of the target – meaning that the weapon will always inflict damage if it hits.
- **Meson Weapons**: Meson weapons are unaffected by armor, as the blast only becomes harmful after it has already passed through the hull. Meson guns also inflict an automatic radiation hit on the crew of any target struck.
- **Pulse Weapons**: Energy weapons, such as lasers, with the pulse designation fire short, rapid bursts of intense energy. Pulse weapons are notoriously inaccurate and suffer a DM -2 on all attack rolls.

Table: Vehicular Turret Weapons

Weapon	TL	Price (Cr)	Spaces	RoF	Range	Dmg	Radius	Recoil	LL
Ballista/Catapult-TL 1	1	Cr1,500	6	1	ranged (very long)	3D6	--	Yes	3
Mortar-TL 2	2	Cr6,000	6	1	ranged (distant)	3D6	10m (7 sq.)	Yes	3
Rocket Artillery-TL 2	2	Cr4,000	15	1	ranged (v long)	2D6	5m (3 squares)	No	3
Artillery Gun-TL 3	3	Cr120,000	24	1	ranged (v distant)	7D6	10m (7 sq.)	Yes	3
Howitzer-TL 3	3	Cr60,000	12	1	ranged (distant)	5D6	10m (7 sq.)	Yes	3
Artillery Gun-TL 4	4	Cr160,000	24	1	ranged (v distant)	8D6	10m (7 sq.)	Yes	3
Howitzer-TL 4	4	Cr80,000	12	1	ranged (distant)	6D6	10m (7 sq.)	Yes	3
Machine Gun-TL 5	5	Cr6,000	3	0/20	ranged (rifle)	4D6	--	Yes	3

Mortar-TL 5	5	Cr8,000	6	1	ranged (distant)	4D6	10m (7 sq.)	Yes	3
Rocket Artillery-TL 5	5	Cr6,000	15	1/3	ranged (distant)	3D6	5m (3 squares)	No	3
Autocannon-TL 6	6	Cr200,000	24	1/4	ranged (distant)	6D6	1.5m (1 sq.)	Yes	3
Missile Rack	6	Cr48,000	12	1/3	By missile	Special	Special	Yes	3
Artillery Gun-TL 7	7	Cr240,000	24	1	ranged (v distant)	10D6	20m (13 sq.)	Yes	3
Howitzer-TL 7	7	Cr120,000	12	1	ranged (distant)	8D6	20m (13 sq.)	Yes	3
Mortar-TL 7	7	Cr12,000	6	1/2	ranged (distant)	6D6	20m (13 sq.)	Yes	3
Pulse Laser-TL 7	7	Cr80,000	3	1/6	ranged (v distant)	6D6	10m (7 sq.)	No	2
Rocket Artillery-TL 7	7	Cr10,000	15	1/6	ranged (distant)	5D6	10m (7 squares)	No	3
Autocannon-TL 8	8	Cr300,000	24	1/6	ranged (distant)	8D6	3m (2 sq.)	Yes	3
Machine Gun-TL 8	8	Cr9,000	3	0/100	ranged (rifle)	6D6	--	Yes	3
Mass Driver-TL 8	8	Cr250,000	180	1	ranged (v distant)	10D6	3m (2 sq.)	Yes	3
Railgun-TL 8	8	Cr150,000	18	1/3	ranged (v distant)	6D6	3m (2 sq.)	Yes	3
Beam Laser-TL 9	9	Cr100,000	3	1/3	ranged (v distant)	6D6	10m (7 sq.)	No	2
Artillery Gun-TL 10	10	Cr280,000	24	1	ranged (v distant)	11D6	30m (20 sq.)	Yes	3
Autocannon-TL 10	10	Cr350,000	24	1/6	ranged (distant)	9D6	4.5m (3 sq.)	Yes	3
Howitzer-TL 10	10	Cr140,000	12	1/2	ranged (distant)	9D6	30m (20 sq.)	Yes	3
Mass Driver-TL 10	10	Cr275,000	180	1	ranged (v distant)	11D6	4.5m (3 sq.)	Yes	3
Mortar-TL 10	10	Cr14,000	6	1/3	ranged (distant)	7D6	30m (20 sq.)	Yes	3
Plasma Gun-TL 10	10	Cr70,000	3	1/6	ranged (v distant)	9D6	15m (10 sq.)	No	2
Pulse Laser-TL 10	10	Cr90,000	3	1/6	ranged (v distant)	7D6	15m (10 sq.)	No	2
Railgun-TL 10	10	Cr175,000	18	1/6	ranged (v distant)	7D6	4.5m (3 sq.)	Yes	3
Rocket Artillery-TL 10	10	Cr12,000	15	1/12	ranged (distant)	6D6	15m (10 squares)	No	3
Beam Laser-TL 11	11	Cr120,000	3	1/3	ranged (v distant)	7D6	15m (10 sq.)	No	2
Meson Accelerator-TL 11	11	Cr180,000	12	1/6	ranged (distant)	11D6	10m (7 sq.)	Yes	2

Artillery Gun-TL 12	12	Cr360,000	24	1	ranged (v distant)	13D6	40m (27 sq.)	Yes	3
Fusion Gun-TL 12	12	Cr180,000	3	1/6	ranged (v distant)	13D6	40m (27 sq.)	No	2
Gauss Cannon-TL 12	12	Cr450,000	24	1/10	ranged (distant)	11D6	6m (4 sq.)	Yes	3
Howitzer-TL 12	12	Cr180,000	12	1/2	ranged (distant)	11D6	40m (27 sq.)	Yes	3
Mortar-TL 12	12	Cr18,000	6	1/3	ranged (distant)	9D6	40m (27 sq.)	Yes	3
Plasma Gun-TL 12	12	Cr90,000	3	1/6	ranged (v distant)	11D6	20m (13 sq.)	No	2
Rapid Pulse Plasma Gun-TL 12	12	Cr90,000	3	1/12	ranged (v distant)	11D6	20m (13 sq.)	No	2
Rocket Artillery-TL 12	12	Cr16,000	15	1/12	ranged (distant)	8D6	20m (13 squares)	No	3
Beam Laser-TL 13	13	Cr160,000	3	1/3	ranged (extreme)	9D6	20m (13 sq.)	No	2
Mass Driver-TL 13	13	Cr325,000	180	1	ranged (extreme)	13D6	6m (4 sq.)	Yes	3
Meson Accelerator-TL 13	13	Cr180,000	12	1/6	ranged (distant)	13D6	10m (7 sq.)	Yes	2
Pulse Laser-TL 13	13	Cr110,000	3	1/6	ranged (extreme)	9D6	20m (13 sq.)	No	2
Railgun-TL 13	13	Cr225,000	18	1/8	ranged (extreme)	9D6	6m (4 sq.)	Yes	3
Rapid Pulse Fusion Gun-TL 14	14	Cr360,000	3	1/12	ranged (v distant)	13D6	40m (27 sq.)	No	2
Artillery Gun-TL 15	15	Cr400,000	24	1/2	ranged (v distant)	14D6	50m (33 sq.)	Yes	3
Fusion Gun-TL 15	15	Cr200,000	3	1/6	ranged (v distant)	14D6	50m (33 sq.)	No	2
Gauss Cannon-TL 15	15	Cr500,000	24	1/15	ranged (distant)	12D6	7.5m (5 sq.)	Yes	3
Howitzer-TL 15	15	Cr200,000	12	1/3	ranged (distant)	12D6	50m (33 sq.)	Yes	3
Meson Accelerator-TL 15	15	Cr200,000	12	1/12	ranged (distant)	14D6	15m (10 sq.)	Yes	2
Mortar-TL 15	15	Cr20,000	6	1/4	ranged (distant)	10D6	50m (33 sq.)	Yes	3
Plasma Gun-TL 15	15	Cr100,000	3	1/6	ranged (v distant)	12D6	25m (17 sq.)	No	2
Pulse Laser-TL 15	15	Cr120,000	3	1/6	ranged (extreme)	10D6	25m (17 sq.)	No	2
Rapid Pulse Plasma Gun-TL 15	15	Cr100,000	3	1/15	ranged (v distant)	12D6	25m (17 sq.)	No	2
Rocket Artillery-TL 15	15	Cr18,000	15	1/12	ranged (distant)	9D6	25m (17 squares)	No	3

Beam Laser-TL 16	16	Cr180,000	3	1/3	ranged (extreme)	10D6	25m (17 sq.)	No	2
Mass Driver-TL 16	16	Cr350,000	180	1	ranged (extreme)	14D6	7.5m (5 sq.)	Yes	3
Railgun-TL 16	16	Cr250,000	18	1/12	ranged (extreme)	10D6	7.5m (5 sq.)	Yes	3
Rapid Pulse Fusion Gun-TL 16	16	Cr400,000	3	1/15	ranged (v distant)	14D6	50m (33 sq.)	No	2
Artillery Gun-TL 17	17	Cr800,000	24	1/2	ranged (extreme)	17D6	60m (40 sq.)	No	3
Fusion Gun-TL 17	17	Cr260,000	3	1/6	ranged (v distant)	17D6	60m (40 sq.)	No	2
Gauss Cannon-TL 17	17	Cr1,000,000	24	1/15	ranged (v distant)	15D6	9m (6 sq.)	No	3
Howitzer-TL 17	17	Cr400,000	12	1/3	ranged (v distant)	15D6	60m (40 sq.)	No	3
Mortar-TL 17	17	Cr40,000	6	1/4	ranged (distant)	13D6	60m (40 sq.)	No	3
Plasma Gun-TL 17	17	Cr130,000	3	1/6	ranged (v distant)	15D6	30m (20 sq.)	No	2
Pulse Laser-TL 17	17	Cr150,000	3	1/6	ranged (extreme)	13D6	30m (20 sq.)	No	2
Rapid Pulse Plasma Gun-TL 17	17	Cr130,000	3	1/24	ranged (v distant)	15D6	30m (20 sq.)	No	2
Rocket Artillery-TL 17	17	Cr24,000	15	1/12	ranged (v distant)	12D6	30m (20 squares)	No	3
Beam Laser-TL 18	18	Cr240,000	3	1/3	ranged (extreme)	13D6	30m (20 sq.)	No	2
Disintegrator-TL 18	18	Cr5,000,000	24	1/3	ranged (v distant)	17D6	9m (6 sq.)	No	2
Mass Driver-TL 18	18	Cr600,000	180	1	ranged (extreme)	17D6	9m (6 sq.)	No	3
Meson Accelerator-TL 18	18	Cr250,000	12	1/12	ranged (v distant)	17D6	15m (10 sq.)	No	2
Railgun-TL 18	18	Cr500,000	18	1/15	ranged (extreme)	13D6	9m (6 sq.)	No	3
Rapid Pulse Fusion Gun-TL 18	18	Cr520,000	3	1/24	ranged (v distant)	17D6	60m (40 sq.)	No	2

Vehicular Weapon Ammunition

The **Vehicular Weapon Ammunition** table describes the price of ammunitions for certain vehicular weapons. (Weapons not included in the table are self-contained munitions that are larger than one Space, or are powered from the energy generated by the vehicle's power plant.) Each column is described as follows:
Price/Space: The price of a full Space (or kiloliter) of standard ammunition for the weapon.
Rounds: The number of rounds in a full Space (or kiloliter) of standard ammunition for the weapon.

Table: Vehicular Weapon Ammunition

Weapon	Price/Space (Cr)	Rounds/Space
Artillery Gun	4,000	25
Autocannon	4,000	25
Ballista/Catapult	100	50
Gauss Cannon	25,000	18,000
Howitzer	2,000	25
Machine Gun	5,000	10,000
Mass Driver	9,000	2
Missile Rack	By Missile	1
Mortar	900	15
Railgun	900	15
Rocket Artillery	5,000	3

Ordinance Bays

Dedicated ordinance bays that carry just one type of weapon cost Cr5,000 per Space of weapon that they are designed to hold. Rate-of-fire is equal to the number of weapons in the bay, and bays can be reloaded.
General purpose ordinance bays able to hold different types of weapons cost Cr10,000 per Space of weapon they are designed to hold. They can launch one missile or torpedo per round, or drop up to half their Space capacity in bombs.
Note that an ordinance bay takes up one weapon point per 60 Spaces in size, or fraction thereof, of the bay itself, minimum of one. For example, a Heavy Nuclear Bomb ordinance bay housing four such bombs occupies 24 Spaces, which takes up one weapon point. An ordinance bay housing 15 Heavy High Explosive Bombs occupies 90 spaces, and takes up two weapon points.

Table: Ordinance Bay Weapons

Ordinance Type	TL	Spaces	Price (Cr)	Range	Damage	Notes
Bomb, High Explosive, Standard	4	3	Cr1,200	ranged (v distant)	12D6	
Torpedo, High Explosive, Standard	4	12	Cr2,400	ranged (v distant)	12D6	Treat as aquatic missiles
Bomb, High Explosive, Heavy	5	6	Cr4,000	ranged (v distant)	14D6	
Torpedo, High Explosive, Heavy	5	24	Cr8,000	ranged (v distant)	14D6	Treat as aquatic missiles
Bomb, Nuclear, Heavy	6	6	Cr8,000	ranged (v distant)	28D6 + 2D6x10 rads	
Bomb, Nuclear, Standard	6	3	Cr2,400	ranged (v distant)	24D6 + 2D6x10 rads	
Torpedo, Nuclear, Heavy	6	24	Cr16,000	ranged (v	28D6 + 2D6x10	Treat as aquatic

				distant)	rads	missiles
Torpedo, Nuclear, Standard	6	12	Cr4,800	ranged (v distant)	24D6 + 2D6x10 rads	Treat as aquatic missiles
Bomb, Antimatter, Heavy	17	6	Cr24,000	ranged (extreme)	42D6 + 4D6x10 rads	
Bomb, Antimatter, Standard	17	3	Cr7,200	ranged (extreme)	36D6 + 4D6x10 rads	
Torpedo, Antimatter, Heavy	17	24	Cr48,000	ranged (extreme)	42D6 + 4D6x10 rads	Treat as aquatic missiles
Torpedo, Antimatter, Standard	17	12	Cr14,400	ranged (extreme)	36D6 + 4D6x10 rads	Treat as aquatic missiles

Missiles

A number of vehicular weapons determine range and damage by the type of tactical missiles they fire. Common missiles are listed in the Vehicular Missiles table. Standard HE refers to Standard High Explosive warheads.

Smart: The attack roll for smart missiles is always 8+, and they may attack every combat round if they miss until they are destroyed, jammed or run out of fuel.

Radiation Hit: In addition to standard damage, both nuclear and antimatter missiles automatically inflict one radiation hit, rolling on the Radiation Damage column of the Crew Hit location.

Table: Vehicular Missiles

Missile Type	TL	Spaces	Price (Cr)	Range	AOE	Dmg
Standard HE, Unguided	3	1	Cr750	ranged (very long)		5D6
Standard HE, Remote-Guided	3	1	Cr750	ranged (very long)		5D6
Standard HE, Heat-Seeking	4	1	Cr1,000	ranged (very long)		6D6
Nuclear, Radar-Guided	6	1	Cr3,750	ranged (very long)		12D6 + 1 radiation hit
Standard HE, Radar-Guided	6	1	Cr1,250	ranged (distant)		6D6
Nuclear, Smart (Computer-Guided)	7	1	Cr5,000	ranged (distant)		16D6 + 1 radiation hit
Standard HE, Smart (Computer-Guided)	7	1	Cr2,500	ranged (very distant)		8D6
Nuclear, NAS-Guided	12	1	Cr2,500	ranged (very long)		13D6
Standard HE, NAS-Guided	12	1	Cr2,500	ranged (distant)		11D6
Antimatter, Smart (AI-Guided)	17	1	Cr10,000	ranged (extreme)		20D6 + 1 radiation hit

Anti-Missile Systems

Systems of this type will typically negate an incoming missile, rocket, launched grenade or mortar round on the roll of 8+. Some systems have Target DMs that modify this, and every system will suffer a –1 DM for every additional target it is forced to engage in each round. The **Anti-Missile System Details** table describes each system.

Table: Anti-Missile System Details

Type	TL	Effect	Spaces	Price(Cr)	Minimum Effective Range	Uses	Reload Price (Cr)
Smoke Dischargers	3	DM+2 vs visual attacks (remote-guided missiles)	1.5	Cr1,000	--	6	Cr100
Chaff Dispensers	4	DM+2 vs thermal-guided attacks (heat-seeking missiles)	1.5	Cr1,200	--	6	Cr150
Flares	6	DM+2 vs radar-guided attacks (homing missiles)	1.5	Cr2,000	--	6	Cr200
Decoys	7	DM+2 vs smart missile attacks (radar-guided missiles)	1.5	Cr8,000	--	6	Cr1,000
Explosive Belt	8	Target DM +0	--	Cr15,000	Short	10	Cr800
Minigun	8	Target DM +0	9	Cr200,000	Medium	10	Cr7,000
Prismatic Aerosols	9	DM+2 vs laser-guided attacks; Lasers -2D6 damage	1.5	Cr4,000	--	6	Cr500
Laser	10	Target DM +1	12	Cr250,000	Medium	--	--
VRF Gauss	11	Target DM +0	9	Cr200,000	Medium	15	Cr20,000

Vehicle Armament Options

The following options are available as modifications on Vehicle Armaments.

Heavy Turret Weapon (TL3): Any vehicular armament that can be mounted in a turret can be purchased in a heavier version. Multiply the weapon's price by 1.5, multiply the weapon's ROF by 0.5, and increase the weapon's damage by 1D6. This cannot be stacked with Light Turret Weapon.

Laser Guidance (TL8): All vehicles with mortars, howitzers, artillery guns, and autocannons can be equipped with laser guidance. This costs Cr1,000, takes up 1 space, and grants a DM +1 on these weapon's attack rolls against a stationary target.

Light Turret Weapon (TL3): Any vehicular armament that can be mounted in a turret can be purchased in a lighter version. Multiply the weapon's price by 0.75, increase the weapon's range by one range band, and decrease the weapon's damage by 1D6. This cannot be stacked with Heavy Turret Weapon.

Missile Guidance System (TL5): All vehicles equipped with missiles can use an installed missile guidance system to better aim missile strikes. This costs Cr10,000, takes up 6 spaces, and grants a DM +1 on missile-based attack rolls against a moving target.

Rotary Turret Weapon (TL5): Any machine gun mounted on a vehicle can be purchased in a rotary version. Double the weapon's price and ROF, and decrease the weapon's damage by 1D6.

Special Rules for Vehicles

The following are special rules related to vehicles and the ***Cepheus Engine VDS***.

Alien Vehicles

The ***Cepheus Engine VDS*** assumes that the vehicle designs are based on humans or humanoid creatures with similar physiological constraints as humans. Alien vehicles typically follow the same design process as humans, but exceptions, particularly in accommodations, may exist based on differences in physiology. The Referee is the final arbiter on those differences.

Airship/Balloon Lift Envelope

Airships and balloons require a lift envelope to hold the lower-density gasses that allow the vessels to fly. Hydrogen and helium balloons can stay aloft almost indefinitely. Hot-air balloons have a duration equal to their Tech Level x 2 hours.

The inflated size of an envelope in Spaces can be calculated as per the formula found in the **Lift Envelope Size by Atmosphere Density** table. The envelope is not considered part of the chassis itself, but can be stored away in a space with a displacement volume equal to one percent (1%) of its inflated size.

All non-explosive weapons inflict only 1 point of damage to the envelope for each hit. Automatic weapons inflict damage equal to their Auto Rating. Once the lift envelope has taken an amount of Structure damage equal to one point per 60 Spaces of lift envelope size, it loses integrity.

Table: Lift Envelope Size by Atmosphere Density

Atmosphere Density	Envelope Size, Hydrogen or Helium	Envelope Size, Hot-Air
Very Thin	UWP Size Code x Chassis (spaces) x 100	UWP Size Code x Chassis (spaces) x 200
Thin	UWP Size Code x Chassis (spaces) x 25	UWP Size Code x Chassis (spaces) x 50
Standard	UWP Size Code x Chassis (spaces) x 10	UWP Size Code x Chassis (spaces) x 20
Dense	UWP Size Code x Chassis (spaces) x 5	UWP Size Code x Chassis (spaces) x 10

Atmospheres and Aircraft

All aircraft can only work properly for world size and atmosphere type UWP codes within 1 of their homeworld. Aircraft operating outside of their design codes suffer a –1 to Agility if they are within 1 of their home UWP codes for atmosphere and/or size, and cannot fly at all if they are operating beyond this, unless they are designed with a wider operation range. In any case, all aircraft require a minimum atmosphere code of 1 in order to function. Aircraft descriptions should include the world size and atmosphere codes.

Extended Operational Environment Range: Aircraft can be designed with a wider operational environment range. This costs 100% of the Base Price of the aircraft but allows it to be used within two digits of the UPP size and atmosphere values instead of just one. These aircraft also suffer a –1 to Agility in all environments.

Missile and Torpedo Attacks

Unlike beam weapons, which travel at the speed of light and so hit the enemy vessel almost instantly, missile and torpedo weapons take time to travel to their target. For the sake of simplicity, they can be assumed to strike after a number of turns dependent on launch range, as shown in the Missile/Torpedo Time to Impact table. Missiles and Torpedoes cannot be used at Personal or Close range.

Table: Missile/Torpedo Time to Impact

Range	Rounds to Impact
Personal	-
Close	-
Short	0
Medium	0
Long	0
Very Long	0
Distant	1
Very Distant	4
Extreme	8

When the missile or torpedo is launched, the gunner must make a Turret Weapons or Bay Weapons skill check to determine the accuracy of the launch. The effect of the skill check determines the chance that the missile or torpedo will strike its target when it hits. A target may react to incoming missiles or torpedoes by dodging or point defense. This reaction does not take place until the turn the missiles arrive at their destination, so any target response must wait until then.

Smart Missiles: The missile to-hit roll for smart missiles is always 8+ and if they miss they make another attack every turn until they are destroyed with point defense, jammed with ECM, run out of fuel or otherwise dissuaded.

Table: Missile To-Hit By Skill Check Effect

Turret Weapons/Bay Weapons check	Missile to-hit roll
Failed With Effect –6 or less	11+
Failed With Effect –1 to –5	10+
Succeeded With Effect 0	8+
Succeeded With Effect 1–5	7+
Succeeded With Effect 6+	6+

Non-Powered Vehicles

Some vehicles do not have a power plant or a powered propulsion system. These rely on two forms of external force to provide movement: animals or the wind.

Animal-Powered Vehicles: Some vehicles, particularly at very low Tech Levels, are powered by living creatures. An animal-powered vehicle requires one point of Strength (Str) per Space of chassis to move at the animal's base walking speed. (Ground vehicles that run on rails halve the required Strength for movement.)

For every five points of Strength less than what is required, Speed and Range decrease by 10%. There is no lower limit and Speed can be reduced to 0 so the vehicle cannot move at all.

Table: Speed and Range Modifiers by Animal Gait

Gait	Speed Modifier	Range
Walk	Walk x 1	Endurance x 30 minutes
Trot	Walk x 2	Endurance x 15 minutes
Canter	Walk x 3	Endurance x 2 minutes
Run	Walk x 4	Endurance x 1 Minutes

Table: Sample Terran Animals Used to Power Vessels

Animal	Str	Speed Walk/Run (km/h)	End
Elephant	24	6/24	15
Horse	10	7/28	12
Human	7	6/24	7
Mule	11	6/24	14
Ox	18	5/20	18

Wind-Powered Vehicles: Often called sailing vessels, wind-powered vehicles depend on the wind and weather to provide the force necessary to move. The **Sailing Speeds** table captures the base speeds of different types of vehicles, as a percentage of wind speed. In the table, water-based also refers to water or similar fluids, depending on the world for which the vessel is designed.

Table: Sailing Speeds

Vehicle Type	Speed (Vehicles under 10 tons)	Speed (Vehicles 10+ tons)
Air-based	35% of wind	40% of wind
Ground-based	20% of wind	15% of wind
Water-based	20% of wind	30% of wind

Off-Road Movement for Ground Vehicles

The listed movement rate for any ground vehicle is its on-road movement. If a ground vehicle goes off-road, it suffers a –2 DM to Agility, Movement rate is reduced to 25% of normal and rough terrain cannot be crossed. A vehicle that is off-road capable does not suffer the –2 DM to Agility, and the Movement rate is not reduced. It can cross rough terrain with a –2 DM to Agility.

Vehicles Over 20 Tons

Some vehicles, such as ocean liners and other large watercraft, exceed the usual 20 tons limit defined by the Vehicle Design System. When designing vehicles of such size, the process remains much the same, with the following exceptions:

1. **Chassis**: Select a hull of the appropriate size, based on tonnage, from the Smallcraft or Ship Design systems in the ***Cepheus Engine Core Rules***. Because the hull does not have to be spaceworthy, divide the hull price by 25 to get an appropriate price for the chassis. Multiply the tonnage of the chassis by 12 to get the number of Spaces available. Construction time remains the same as the original hull.
2. **Power Plant**: Select an appropriate power plant and maneuver drive from the Smallcraft or Ship Design system to represent the vehicle's power plant. The differences in power plant construction for vehicles as opposed to space ships lead to a few changes in volume and price. Modify these values as needed based on Power Plant Type.

   Vehicle Power Plant Spaces = Ship/Smallcraft Power Plant Drive tonnage x 0.90 x 12
   Vehicle Power Plant Price = Power Plant Drive price x 0.006

3. **Propulsion**: Select an appropriate maneuver drive from the Smallcraft or Ship Design system to represent the vehicle's propulsion system. The differences in propulsion systems for vehicles as opposed to space ships lead to a few changes in volume and price. Use the Performance number given in the Smallcraft or Ship Design system to determine the craft's base speed. Modify these values as needed based on Propulsion Type.

Vehicle Contact-Based Propulsion System Spaces = Ship/Smallcraft Maneuver Drive tonnage x 12
Vehicle Contact-Based Propulsion System Price = Ship/Smallcraft Maneuver Drive price x 0.0055

Vehicle Thrust-Based Propulsion System Spaces = Ship/Smallcraft Maneuver Drive tonnage x 0.90 x 12
Vehicle Thrust-Based Propulsion System Price = Ship/Smallcraft Maneuver Drive price x 0.25

4. **Crew**: Determine crew using the standard Ship Design rules in **Chapter 8: Ship Design and Construction** of the core rules. Commercial and private vehicles tend to use the Minimum column of the **Ship Crew Requirements** table, while military vehicles tend to use the Full Complement column.
5. **Additional Vehicle Components**: In addition to Vehicle Components, large vehicles can purchase an airlock or other ship design components. Multiply the tonnage of the component by 12 to get the number of Spaces it takes up.
6. **Armaments**: Large vehicles have one hardpoint per 100 tons of displacement, minimum of one hardpoint, and can install ship weapons as per the ship design process, in addition to vehicle weapons.

Universal Vehicle Description Format

After a vehicle design has been created, it must be presented in a format that allows players to use the information within the game. The ***Cepheus Engine VDS*** describes vehicle designs using a universal vehicle description format, which is essentially a paragraph of text laid out in the following manner. Examples can be found in **Chapter 2: Common Aircraft** through **Chapter 6: Uncommon Vehicles**.

[Vehicle's Tech Level] [Vehicle Descriptive Name]
Using a/an [Vehicle Configuration] [Vehicle Chassis Displacement]-ton chassis ([Chassis Damage Value] Hull, [Structure Damage Value] Structure, Armor [Total Armor Value]), the [Vehicle Descriptive Name] is [General Description of Vehicle's Function]. [List any vehicle configuration options, if any.] It carries a [Vehicle Power Plant Type] power plant/engine, Code [Power Plant Drive Code], and a/an [Vehicle Propulsion Type] propulsion system, Code [Propulsion System Drive Code], giving a top speed of [Vehicle Base Speed], a cruising speed of [Cruising Speed] and an Agility DM of [Agility DM]. [List any vehicle drive options, if any.] [Fuel Volume] kiloliters of [Fuel Type] support the power plant for [Duration of Vehicle Use]. [Any additional fuel usage notes.] This vehicle is equipped with [Vehicle Control System Interface] controls, [Vehicle Communication System] communication ([Communication System Range]), [Sensors Type] sensors ([Sensors Comms DM]), and a Model [Computer Model] computer. [Include any additional notes on the vehicles Control Systems, Communications Systems, Sensors or Computer.] There are [list accommodations individually by type and number]. The vehicle has [Number of Weapon Points] weapon points. [Describe any vehicle armaments that have been installed, if any. Also note any ammunition carried.] [List any additional vehicle components here]. Cargo capacity is [Cargo Tonnage] tons (or [Cargo Spaces] kiloliters). The chassis is additionally armored with [Armor Type] (x[Level of Additional Armor].) [Note any Vehicle's Armor options that have been installed.] The vehicle requires a crew of [Crew Total]: [List crew positions]. The vehicle can carry up to [list additional passenger count individually by number and type of accommodation]. The vehicle costs KCr[Price of Vehicle] (including discounts and fees) and takes [Construction Time] hours to build.

CHAPTER 2: COMMON AIRCRAFT

This section describes some of the common types of aircraft that can be encountered in ***Cepheus Engine*** campaigns. These are not the only types of vessels that exist, and creative Referees are encouraged to integrate aircraft of their own creation or from other sources into their universes as they see fit.

TL5 Biplane

Using an open one-ton chassis (0 Hull, 1 Structure, Armor 2), the Biplane is a primitive form of aircraft with two pairs of wings, one above the other. It carries an internal combustion engine, Code D, and a horizontally-mounted rotor propulsion system, Code D, giving a top speed of 200 kph, a cruising speed of 150 kph, and an Agility DM of -1. 14 liters of hydrocarbons support the power plant for three hours. This vehicle is equipped with basic controls. There is one basic cockpit and one standard seat. Cargo capacity is slightly less than one kiloliter. The vehicle requires a crew of one, the pilot. The vehicle can carry up to one additional passenger comfortably in a standard seat. The vehicle costs KCr20.670 (including discounts and fees) and takes 9 hours to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	12	2400	Code 4
	Configuration		-240	Open
Power Plant	Internal Combustion	-4.5	42.5	Code D
Propulsion	Rotor (horizontal mount)	-1.5	18750	Code D
Fuel	Hydrocarbons	-0.014	11.2	Fuel capacity = 3 hours
Controls	Basic	-1		
Accommodations	Basic Cockpit	-2	1000	One crew
	Standard Seat	-2	1000	One passenger
Cargo		-0.99		
TOTALS		0	22963.71	Cr20,670 with Std Design Discount

TL7 Helicopter

Using a closed four-ton chassis (0 Hull, 1 Structure, Armor 3), the Helicopter is an aircraft that derives both lift and propulsion from one or more sets of revolving overhead rotors. It is capable of moving vertically and horizontally, the direction of motion being controlled by the pitch of the rotor blades. It carries a Gas Turbine engine, Code M, and a vertically mounted rotor propulsion system, Code M, giving a top speed of 250 kph, a cruising speed of 187.5 kph, and an Agility DM of -2. 90 liters of hydrocarbons support the power plant for three hours. This vehicle is equipped with basic controls and a Class III communication system (Regional). There is an extended cockpit and six cramped seats. Cargo capacity is 11.86 kiloliters. The vehicle requires a crew of one, the pilot. The vehicle can carry one passenger in the cockpit and up to six passengers in cramped seats. The vehicle costs KCr154.810 (including discounts and fees) and takes 36 hours to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	48	6250	Code 8
	Configuration			Closed
Power Plant	Gas Turbine	-10.5	1481.25	Code M
Propulsion	Rotor (vertical mount)	-12.5	156250	Code M
Fuel	Hydrocarbons	-0.09	74.7	Fuel capacity = 3 hours
Controls	Basic	-1		
Communications	Class III	-0.05	2000	Regional (500 km)
Accommodations	Extended Cockpit	-4	2000	Two crew
	Cramped Seat	-8	4000	Six people, cramped
Cargo		-11.86		
TOTALS		0	172055.95	Cr154,810 with Std Design Discount

TL7 Twin Engine Jet

Using a closed five-ton chassis (1 Hull, 1 Structure, Armor 3), the Twin Engine Jet is a fixed-wing aircraft propelled by jet engines, often for rapid transportation of small groups. It carries a Gas Turbine engine, Code N, and a jet propulsion system, Code N, giving a top speed of 750 kph, a cruising speed of 562.5 kph, and an Agility DM of -1. 230 liters of hydrocarbons support the power plant for six hours. This vehicle is equipped with basic controls and a Class III communication system (Regional). There is an extended cockpit and six cramped seats. Cargo capacity is 17.22 kiloliters. The vehicle requires a crew of one, the pilot. The vehicle can carry one passenger in the cockpit and up to six passengers in cramped seats. The vehicle costs KCr736.110 (including discounts and fees) and takes 45 hours to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	60	7800	Code 9
	Configuration			Closed
Power Plant	Gas Turbine	-13.5	1900	Code N
Propulsion	Jet	-16	800000	Code N
Fuel	Hydrocarbons	-0.23	194.22	Fuel capacity = 6 hours
Controls	Basic	-1		
Communications	Class III	-0.05	2000	Regional (500 km)
Accommodations	Extended Cockpit	-4	2000	Two crew
	Cramped Seat	-8	4000	Six people, cramped
Cargo		-17.22		
TOTALS		0	817894.22	Cr736,110 with Std Design Discount

CHAPTER 3: COMMON GRAV VEHICLES

This section describes some of the grav vehicles that can be commonly encountered in ***Cepheus Engine*** campaigns. These are not the only types of grav vehicles that exist, and creative Referees are encouraged to integrate grav vehicles of their own creation or from other sources into their universes as they see fit.

TL9 Air/Raft

Using an open four-ton chassis (0 Hull, 1 Structure, Armor 3), the Air/Raft is a classic example of a basic vehicle propelled by anti-gravity technology. It carries an Early Fusion power plant, Code E, and a Grav propulsion system, Code E, giving a top speed of 100 kph, a cruising speed of 75 kph, and an Agility DM of +0. 1.61 liters of hydrogen support the power plant for 28 days. This vehicle is equipped with Advanced controls, a Class III communication system (Regional), basic civilian sensors (DM -2), and a Model 1 computer. It also comes equipped with Autopilot (Grav Vehicle-0). There is a basic cockpit and three cramped seats. Cargo capacity is 24.57 kiloliters, or just over two displacement tons. The vehicle requires a crew of one, the pilot. The vehicle can carry three additional passengers in cramped seats. The vehicle costs KCr94.340 (including discounts and fees) and takes 36 hours to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	48	6250	Code 8
	Configuration		-625	Open
Power Plant	Early Fusion	-1.25	1425	Code E
Propulsion	Grav	-1.4	70000	Code E
Fuel	Hydrogen	-1.61	64.51	Fuel capacity = 672 hours
Controls	Advanced	-2	10000	
	Autopilot		2000	Grav Vehicle-0
Communications	Class III	-0.05	2000	Regional (500 km)
Sensors	Basic Civilian	-6	10000	
Computer	Model 1	-0.01	500	
Accommodations	Basic	-2	1000	One crew
	Cramped Seat	-4	2000	Three passengers, cramped
Cargo		-24.57		
TOTALS		0	104614.5	Cr94,160 with Std Design Discount

TL15 G/Carrier

Using a closed eight-ton chassis (1 Hull, 2 Structure, Armor 18), the G/Carrier, or Grav Carrier, is effectively a flying tank, and is the standard fighting vehicle of many High Stellar military forces. It carries an Advanced Fusion power plant, Code S, and an Extreme Grav propulsion system, Code S, giving a top speed of 2000 kph, a cruising speed of 1500 kph and an Agility DM of +1. 7.06 kiloliters of hydrogen support the power plant for 28 days. This vehicle is equipped with Advanced controls, a Class IV communication system (Continental), basic military sensors (DM +0), and a Model 5/fib computer. It also comes equipped with Autopilot (Grav Vehicle-2). There is one extended cockpit and twelve cramped seats. The vehicle has one weapon point, bearing a powered ring mount armed with a Fusion Gun-TL 15, which is protected by gun shields (Armor 7). The G/Carrier is equipped with environmental protection (vacuum) and basic life support for 10 days. Cargo capacity is 24.99 kiloliters. The chassis is additionally armored with Bonded Superdense (x2.) The vehicle requires a crew of two: one pilot, one gunner. The vehicle can carry up to 12 additional passengers in cramped seats. The vehicle costs KCr3,138.560 (including discounts and fees) and takes 864 hours (36 days) to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	96	13350	Code C
	Configuration			Closed
	Armor	-9.6	13350	Bonded Superdense (Armor x2)
	Environmental Protection (Vacuum)	-3	960000	
Power Plant	Advanced Fusion	-5.25	23650	Code S
Propulsion	Extreme Grav	-6	2400000	Code S
Fuel	Hydrogen	-7.06	282.24	Fuel capacity = 672 hours
Controls	Advanced	-2	10000	Agility +1
	Autopilot		12000	Grav Vehicle-2
Communications	Class IV	-0.1	4000	Continental (5000 km)
Sensors	Basic Military	-12	20000	Comms DM +0; Very Distant (50 km)
Computer	Model 5	0	10000	
	Options		5000	Hardened (fib)
Accommodations	Extended Cockpit	-4	2000	Two crew (pilot, gunner)
	Cramped Seats	-16	8000	12 passengers, cramped
	Basic Life Support	-3	3500	Last 10 days
Armaments	Ring Weapon Mount, Powered		2150	
	Gun Shield		1400	Armor 7
	Fusion Gun-TL 15	-3	200000	
Cargo		-24.99		
TOTALS		0	3487282.24	Cr3138560 with Std Design Discount

TL12 Grav Bike

Using an open 0.5-ton chassis (0 Hull, 1 Structure, Armor 5), the Grav Bike is a light form of personal anti-gravity transport commonly used for rapid transit over planetary surfaces. It carries a Fusion power plant, Code B, and an Advanced Grav propulsion system, Code B, giving a top speed of 400kph, a cruising speed of 300kph, and an Agiliity DM of +1. 320 liters of Hydrogen support the power plant for 28 days. This vehicle is equipped with Basic controls, a Class IV communication system (Continental), and a Model 3 computer. It also comes equipped with Autopilot (Grav Vehicle-1). There is one basic cockpit. Cargo capacity is 2.21 kiloliters. The vehicle requires a crew of one: the pilot. The vehicle cannot carry any additional passengers. The vehicle costs KCr41.390 (including discounts and fees) and takes 5 hours to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	6	1850	Code 3
	Configuration		-185	Open
Power Plant	Fusion	-0.15	300	Code B
Propulsion	Advanced Grav	-0.23	30000	Code B
Fuel	Hydrogen	-0.32	12.902	Fuel capacity = 672 hours
Controls	Basic	-1	0	Agility +0
	Autopilot		7000	Grav Vehicle-1
Communications	Class IV	-0.1	4000	Continental (5000 km)
Computer	Model 3	0	2000	
Accommodations	Basic Cockpit	-2	1000	One crew (pilot)
Cargo		-2.21		
TOTALS		0	45977.9024	Cr41,390 with Std Design Discount

TL11 Grav Floater

Using an open one-ton chassis (0 Hull, 1 Structure, Armor 4), the Grav Floater is a floating platform designed for a single pilot. It carries an Early Fusion power plant, Code B, and a Grav propulsion system, Code B, giving a top speed of 100 kph, a cruising speed of 75 kph, and an Agility DM of +2. 170 liters of hydrogen support the power plant for 14 days. This vehicle is equipped with Advanced controls, a Class III communication system (Regional), standard sensors (DM -4), and a Model 1 computer. It also comes equipped with Autopilot (Grav Vehicle-1). There is a basic cockpit. Cargo capacity is 4.39 kiloliters. The vehicle requires a crew of one, the pilot. The vehicle cannot carry any additional passengers. The vehicle costs KCr30,580 (including discounts and fees) and takes 9 hours to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	12	2400	Code 5
	Configuration		-240	Open
Power Plant	Early Fusion	-0.26	300	Code B
Propulsion	Grav	-0.12	6000	Code B
Fuel	Hydrogen	-0.17	6.96	Fuel capacity = 336 hours
Controls	Advanced	-2	10000	Agility +1
	Autopilot		7000	Grav Vehicle-1
Communications	Class III	-0.05	2000	Regional (500 km)
Sensors	Standard	-3	5000	Comms DM -4
Computer	Model 1	-0.01	500	
Accommodations	Cockpit, basic	-2	1000	One crew
Cargo		-4.39		
TOTALS		0	33966.96	Cr30580 with Std Design Discount

TL9 Grav Tank

Using a closed 8-ton chassis (1 Hull, 2 Structure, Armor 9), the Grav Tank is a popular TL9 military grav vehicle for resolving planetary surface conflicts. It carries an Early Fusion power plant, Code S, and a Grav propulsion system, Code S, giving a top speed of 500kph, a cruising speed of 375kph and an Agility DM of +1. 14.11 kiloliters of hydrogen support the power plant for 28 days. This vehicle is equipped with Advanced controls, a Class IV communication system (Continental), Basic Civilian sensors (DM -2), and a Model 1/fib computer. It also comes equipped with Autopilot (Grav Vehicle-0). There is one extended cockpit and twelve cramped seats. The vehicle has one weapon point, bearing a small turret armed with a Beam Laser-TL 9. The Grav Tank is equipped with environmental protection (vacuum) and basic life support for 10 days. Cargo capacity is 12.18 kiloliters. The chassis is additionally armored with Titanium Steel (x2.) The vehicle requires a crew of two: one pilot, one gunner. The vehicle can carry up to 12 additional passengers in cramped seats. The vehicle costs KCr1,469.400 (including discounts and fees) and takes 432 hours (18 days) to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	96	13350	Code C
	Configuration			Closed
	Armor	-9.6	2670	Titanium Steel (Armor x2)
	Environmental Protection (Vacuum)	-3	960000	
Power Plant	Early Fusion	-10.5	11825	Code S
Propulsion	Grav	-12	600000	Code S
Fuel	Hydrogen	-14.11	564.48	Fuel capacity = 672 hours
Controls	Advanced	-2	10000	Agility +1
	Autopilot		2000	Grav Vehicle-0
Communications	Class IV	-0.1	4000	Continental (5000 km)
Sensors	Basic Civilian	-6	10000	Comms DM -2; Distant (5 km)
Computer	Model 1	-0.01	500	
	Options		250	Hardened (fib)
Accommodations	Extended Cockpit	-4	2000	Two crew (pilot, gunner)
	Cramped Seats	-16	8000	12 passengers, cramped
	Basic Life Support	-3	3500	Lasts 10 days
Armaments	Turret (Small)	-0.5	4000	
	Beam Laser-TL 9	-3	100000	
Cargo		-12.18		
TOTALS		0	1632659.48	Cr1469400 with Std Design Discount

TL9 Speeder

Using a closed 2-ton chassis (0 Hull, 1 Structure, Armor 3), the Speeder is a grav-powered craft intended for high speed transit across a planetary surface. The Speeder's chassis is streamlined. It carries an Early Fusion power plant, Code E, and a Grav propulsion system, Code E, giving a top speed of 1000kph, a cruising speed of 750kph and an Agility DM of +2. 810 liters of hydrogen support the power plant for 28 days. This vehicle is equipped with Advanced controls, a Class IV communication system (Continental), Basic Civilian sensors (DM -2), and a Model 1 computer. It also comes equipped with Autopilot (Grav Vehicle-0). There is one extended cockpit. The Speeder comes compete with an entertainment system. This vehicle is equipped with environmental protection (vacuum) and basic life support for 10 days. Cargo capacity is 2.43 kiloliters. The vehicle requires a crew of one: the pilot. The vehicle can carry up to one additional passenger in the extended cockpit. The vehicle costs KCr330.250 (including discounts and fees) and takes 18 hours to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	24	3550	Code 6
	Configuration			Closed
	Options		17750	Streamlined
	Environmental Protection (Vacuum)	-3	240000	
Power Plant	Early Fusion	-1.25	1425	Code E
Propulsion	Grav	-1.4	70000	Code E
Fuel	Hydrogen	-0.81	32.256	Fuel capacity = 672 hours
Controls	Advanced	-2	10000	Agility +1
	Autopilot		2000	Grav Vehicle-0
Communications	Class IV	-0.1	4000	Continental (5000 km)
Sensors	Basic Civilian	-6	10000	Comms DM -2; Distant (5 km)
Computer	Model 1	-0.01	500	
Accommodations	Extended Cockpit	-4	2000	Two crew (pilot, gunner)
	Basic Life Support	-3	3500	Last 10 days
Additional Components	Entertainment System	-0	200	
Cargo		-2.43		
TOTALS		0	366957.256	Cr330,250 with Std Design Discount

CHAPTER 4: COMMON GROUND VEHICLES

This section details various ground-based vehicles that can be commonly encountered in ***Cepheus Engine*** campaigns. Creative Referees are encouraged to introduce other common vehicles as they see fit.

TL12 AFV, Tracked

Using a closed ten-ton chassis (2 Hull, 2 Structure, Armor 25), the Tracked Armored Fighting Vehicle (AFV) is a heavily armored tracked vehicle used in military engagements on planetary surfaces. This vehicle is equipped with Insidious Environmental Protection. It carries a Fusion power plant, Code Q, and a Tracked propulsion system, Code Q, giving a top speed of 67.5 kph, a cruising speed of 50 kph and an Agility DM of -1. This vehicle is equipped for Off-Road Capability. 1.51 kiloliters of hydrogen support the power plant for 72 hours. This vehicle is equipped with Advanced controls, a Class IV communication system (Continental), a Laser Class IV communication system (Continental), Basic Military sensors (Comms DM +0), and a Model 3 computer. This vehicle also comes equipped with Autopilot (Tracked Vehicles-1). There is an extended cockpit and cramped seating for six. The vehicle has one weapon point, bearing a small turret armed with a Beam Laser-TL 11. This vehicle is also equipped with basic life support (covers 20 people for 10 days), a fresher, and a galley suitable for 8 people. Cargo capacity is 11.31 kiloliters. The chassis is additionally armored with Superdense armor (x4).The vehicle requires a crew of two: one driver and one gunner. The vehicle can carry up to six passengers in cramped seating. The vehicle costs KCr287.790 (including discounts and fees) and takes 240 hours (10 days) to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	120	17750	Code E
	Configuration			Closed
	Armor	-24	14200	Superdense (x4)
	Insidious EPS	-6	50000	
Power Plant	Fusion	-6.38	9575	Code Q
Propulsion	Tracked	-11	21450	Code Q
	Off-Road Capability		10725	
Fuel	Hydrogen	-1.51	60.48	Fuel capacity = 72 hours
Controls	Advanced	-2	10000	+1 Agility
	Autopilot		7000	Tracked Vehicle-1
Communications	Class IV	-0.1	4000	Continental (5000 km)
	Laser Class IV	-0.2	12000	
Sensors	Basic Military	-12	20000	Comms DM +0
Computer	Model/3	0	2000	
Accommodations	Cockpit, Extended	-4	2000	Supports two crew
	Seating, Cramped (x2)	-8	4000	Seats 6 people cramped
	Basic Life Support	-3	3500	Lasts 10 days for 20 people
Additional Components	Fresher	-6	1500	
	Galley (8 people)	-21	6000	
Armaments	Turret (Small)	-0.5	4000	
	Beam Laser-TL 11	-3	120000	
Cargo		-11.31		
TOTALS		0	319760.48	Cr287790 with Std Design Discount

TL12 ATV, Tracked

Using a closed ten-ton chassis (2 Hull, 2 Structure, Armor 5), the Tracked All-Terrain Vehicle (ATV) is a tracked vehicle frequently used for exploring planetary surfaces. This vehicle is equipped with Insidious Environmental Protection. It carries a Fusion power plant, Code Q, and a Tracked propulsion system, Code Q, giving a top speed of 67.5 kph, a cruising speed of 50 kph and an Agility DM of -1. This vehicle is equipped for Off-Road Capability. 1.51 kiloliters of hydrogen support the power plant for 72 hours. This vehicle is equipped with Advanced controls, a Class IV communication system (Continental), a Laser Class IV communication system (Continental), Basic Civilian sensors (Comms DM -2), and a Model 3 computer. This vehicle also comes equipped with Autopilot (Tracked Vehicles-1). There is an extended cockpit and cramped seating for six. This vehicle is also equipped with basic life support (covers 20 people for 10 days), a fresher, and a galley suitable for 8 people. Cargo capacity is 3.73 tons. The vehicle requires a crew of one: the driver. The vehicle can carry up to one additional passenger in the extended cockpit and six passengers in cramped seating. The vehicle costs KCr154.410 (including discounts and fees) and takes 60 hours to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	120	17750	Code E
	Configuration			Closed
	Insidious EPS	-6	50000	
Power Plant	Fusion	-6.38	9575	Code Q
Propulsion	Tracked	-11	21450	Code Q
	Off-Road Capability		10725	
Fuel	Hydrogen	-1.51	60.48	Fuel capacity = 72 hours
Controls	Advanced	-2	10000	+1 Agility
	Autopilot		7000	Tracked Vehicle-1
Communications	Class IV	-0.1	4000	Continental (5000 km)
	Laser Class IV	-0.2	12000	
Sensors	Basic Civilian	-6	10000	Comms DM -2
Computer	Model/3	0	2000	
Accommodations	Cockpit, Extended	-4	2000	Supports two crew
	Seating, Cramped (x2)	-8	4000	Seats 6 people cramped
	Basic Life Support	-3	3500	Lasts 10 days for 20 people
Additional Components	Fresher	-6	1500	
	Galley (8 people)	-21	6000	
Cargo		-44.81		
TOTALS		0	171560.48	Cr154410 with Std Design Discount

TL5 Ground Car

Using a closed one-ton chassis (0 Hull, 1 Structure, Armor 2), the Ground Car is a wheeled, self-powered motor vehicle used for transportation. It carries an Internal Combustion engine, Code C, and a Wheeled propulsion system, Code C, giving a top speed of 100 kph, a cruising speed of 75 kph and an Agility DM of +3. 12 liters of hydrocarbons support the power plant for 5 hours. This vehicle is equipped with Basic controls. There is an extended cockpit and three cramped seats. Cargo capacity is 38 liters. The vehicle requires a crew of one: the driver. The vehicle can carry up to four passengers, one in the extended cockpit and three in cramped seating. The vehicle costs KCr6.290 (including discounts and fees) and takes 9 hours to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	12	2400	Code 5
	Configuration			Closed
Power Plant	Internal Combustion	-2.4	22.5	Code C
Propulsion	Wheels	-0.55	550	Code C
Fuel	Hydrocarbons	-0.012	9.5865	Fuel capacity = 5 hours
Controls	Basic	-1	0	Included in Chassis Price
Accommodations	Extended Cockpit	-4	2000	Two crew (pilot, gunner)
	Seat, Cramps	-4	2000	Seats 3 people cramped
Cargo		-0.038		
TOTALS		0	6982.0865	Cr6290 with Std Design Discount

TL3 Stagecoach

Using an open two-ton chassis (0 Hull, 1 Structure, Armor 1), the Stagecoach is a type of covered wagon used to carry passengers and goods inside, generally drawn by four horses, or similar beasts of burden. It carries a non-powered wheel propulsion system, Code D, giving a top speed and cruising speed based on the beasts pulling it, and an Agility DM of +1. This vehicle is equipped with primitive controls. There is one extended cockpit and six cramped seats. Cargo capacity is 10.5 kiloliters. The vehicle requires a crew of one, the driver, although there is room for a second driver if needed. The vehicle can carry up to six additional passengers in cramped seats. The vehicle costs KCr8.080 (including discounts and fees) and takes 18 hours to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	24	3550	Code 6
	Configuration		-355	Open
Power Plant	Animal-Powered	0	0	
Propulsion	Wheeled, Non-Powered	-1	487.5	Code D
Controls	Primitive	-0.5	-710	Agility -1
Accommodations	Extended Cockpit	-4	2000	Two crew (pilot, gunner)
	Cramped Seats	-8	4000	6 passengers, cramped
Cargo		-10.5		
TOTALS		0	8972.5	Cr8080 with Std Design Discount

TL5 Van

Using a closed two-ton chassis (0 Hull, 1 Structure, Armor 2), the Van is a type of road vehicle used for transporting goods or people. It carries an Internal Combustion engine, Code E, and a Wheeled propulsion system, Code E, giving a top speed of 100 kph, a cruising speed of 75 kph and an Agility DM of +3. 72 liters of hydrocarbons support the power plant for 10 hours. This vehicle is equipped with Basic controls. There is an extended cockpit. Cargo capacity is 9.83 kiloliters. The vehicle requires a crew of one: the driver. The vehicle can carry another passenger in the cockpit. The vehicle costs KCr6.540 (including discounts and fees) and takes 18 hours to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	24	3550	Code 6
	Configuration			Closed
Power Plant	Internal Combustion	-7.5	71.25	Code E
Propulsion	Wheels	-1.6	1575	Code E
Fuel	Hydrocarbons	-0.072	59.76	Fuel capacity = 10 hours
Controls	Basic	-1	0	Included in Chassis Price
Accommodations	Extended Cockpit	-4	2000	Two crew (pilot, passenger)
Cargo		-9.828		
TOTALS		0	7256.01	Cr6540 with Std Design Discount

CHAPTER 5: COMMON WATERCRAFT

This section describes some of the watercraft that can be commonly encountered in ***Cepheus Engine*** campaigns. These are not the only types of vessels that exist, and creative Referees are encouraged to integrate vehicles of their own creation or from other sources as they see fit.

TL9 Destroyer

Using a closed 800-ton chassis (160 Hull, 160 Structure [Personal Combat Scale], 16 Hull, 16 Structure [Space Combat Scale], Armor 6), the Destroyer is a fast, maneuverable long-endurance watercraft built for military action, intended to escort larger watercraft in a fleet, convoy or battle group and defend them against smaller powerful short-range attackers. It carries an Early Fusion power plant, Code K, and a Screw Propeller propulsion system, Code K, giving a top speed of 60kph, a cruising speed of 45kph and an Agility DM of -3. 496 kiloliters of hydrogen support the power plant for 28 days. This vehicle is designed with an increased Agility, already included in the Agility DM above. This vehicle is equipped with Advanced controls, a Class IV communication system (Continental), Basic Civilian sensors (DM -2), and a Model/1fib computer. This vessel is equipped with Autopilot (Ocean Ships-2). There is an extended control cabin that supports 30 crew on shift), and 29 standard staterooms. The vehicle has 160 weapon points, but only 23 are used. The vehicle has four small turrets armed with Autocannon-TL 8, one small turret armed with a Heavy Mass Driver-TL 8, eight small turrets armed with Heavy Rocket Artillery-TL 7, four missile racks (armed with Smart Standard HE missiles), and two HE torpedo ordinance bays (3 torpedoes each). This vehicle also carries 1800 rounds of Autocannon ammunition, 300 rounds of Heavy Mass Driver ammunition, 900 rounds of Heavy Rocket Artillery ammunition, 900 Smart Standard HE missiles, and 240 Standard HE torpedoes. Cargo capacity is 70.615 tons. The chassis is additionally armored with Titanium Steel (x2.) The vehicle requires a crew of 28: 1 Captain, 1 Executive Officer, 3 Pilots, 1 Navigator, 1 Engineer, 1 Sensors Operator, 17 Turret Gunners, 2 Bay Weapon Gunners, and 1 Chief Security Officer. The vehicle can carry up to forty additional passengers in twenty standard staterooms, or forty-two if both the Captain and Executive Officer share a stateroom. The vehicle costs KCr51,521.940 (including discounts and fees) and takes 92 weeks to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	9600	20000000	800-ton Hull
	Configuration			Closed
	Armor	-960	4000000	Titanium Steel (Armor 6)
Power Plant	Early Fusion	-334.8	480000	Code K (Ship Drive)
Propulsion	Screw Propeller	-205.2	1000000	Code K (Ship Drive)
	Increased Agility		10000000	Agility +1
Fuel	Hydrogen	-496	19840	Fuel capacity = 672 hours
Controls	Advanced	-2	10000	Agility +1
	Autopilot		12000	Ocean Ships-2
Communications	Class IV	-0.1	4000	Continental (5000 km)
Sensors	Basic Civilian	-6	10000	Comms DM-2; Distant (5 km)
Computer	Model/1	-0.01	500	
	Options		250	Hardened System (fib)
Accommodations	Control Cabin, Standard plus Extended	-324	90000	
	Standard Staterooms (x36)	-1728	18000000	
Armaments	Small Turrets (x17)	-8.5	3620000	
	Autocannon-TL 8 (x4)	-96	1200000	4 weapon points taken
	Heavy Mass Driver-TL 8 (x1)	-180	375000	3 weapon points taken
	Heavy Rocket Artillery-TL 7 (x8)	-120	120000	8 weapon points taken
	Missile Rack (x4)	-48	19200	4 weapon points taken
	Ordinance Bay (x2, 3 HE Torpedos each)	-72	360000	4 weapon points taken
Ammunition	Autocannon Ammo	-72	1152000	1800 rounds of ammunition (30 minutes)
	Heavy Mass Driver Ammo	-20	27000	300 rounds of ammunition (30 minutes)
	Heavy Rocket Artillery Ammo	-300	2250000	900 rounds of ammunition (30 minutes)
	Missiles, Std HE, Smart (Computer-Guided)	-900	2250000	900 rounds of ammunition (30 minutes)
	Torpedoes, Std HE	-2880	960000	240 rounds of ammunition (4 minutes)
Cargo		-847.39		
TOTALS		0	57246590	Cr51,521,940 with Std Design Discount

TL7 Hovercraft

Using a closed eight-ton chassis (1 Hull, 2 Structure, Armor 3), the Hovercraft is a ground effect vehicle supported on a cushion of air roughly two meters high, with the ability to move about on both water and land, so long as travel conditions and surfaces are not irregular, turbulent or rough. It carries a Gas Turbine engine, Code L, and an Air Cushion propulsion system, Code L, giving a top speed of 100kph, a cruising speed of 75kph and an Agility DM of +1. 430 liters of hydrocarbons support the power plant for 16 hours. This vehicle is equipped with Basic controls and a Class III communication system (Regional). There is a basic cockpit and 15 cramped chairs. The vehicle also has a fresher installed. Cargo capacity is 4.35 tons. The vehicle requires a crew of one: the pilot. The vehicle can carry up to fifteen additional passengers in cramped seating. The vehicle costs KCr144.660 (including discounts and fees) and takes 36 hours to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	96	13350	Code C
	Configuration			Closed
Power Plant	Gas Turbine	-9	1268.75	Code L
Propulsion	Air Cushion	-5.25	131250	Code L
Fuel	Hydrocarbons	-0.43	354.576	Fuel capacity = 16 hours
Controls	Basic	-1	0	Included in Chassis Price
Communications	Class III	-0.05	2000	Regional (500 km)
Accommodations	Cockpit, Basic	-2	1000	1 Crew (1 Pilot)
	Cramped Seats	-20	10000	15 passengers, cramped
Additional Components	Fresher	-6	1500	
Cargo		-52.27		Cargo = 4.356 tons, or 4356kg
TOTALS		0	160723.326	Cr144,660 with Std Design Discount

TL5 Motor Boat

Using a closed 60-ton chassis (12 Hull, 12 Structure [Personal Combat Scale], 1 Hull, 1 Structure [Space Combat Scale], Armor 2), the Motor Boat is a watercraft designed to transport a limited amount of passengers and cargo from point to point over small bodies of water. The vehicle is streamlined. It carries an Internal Combustion engine, Code sC, and a Screw Propeller propulsion system, Code sC, giving a top speed of 100kph, a cruising speed of 75kph and an Agility DM of -2. 1.29 kiloliters of hydrocarbons support the power plant for 10 hours. This vehicle is equipped with Basic controls, and a Class II communication system (Very Distant). There are a standard control cabin and five standard staterooms. Cargo capacity is 22.74 tons. The vehicle requires a crew of two: one Pilot and one Engineer. The vehicle can carry up to eight additional passengers in four standard staterooms. The vehicle costs KCr2,698.450 (including discounts and fees) and takes 32 weeks to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	720	400000	60-ton Hull
	Configuration			Closed
Power Plant	Internal Combustion	-116.64	1200	Code sC (Ship Drive)
Propulsion	Screw Propeller	-16.2	75000	Code sC (Ship Drive)
Fuel	Hydrocarbons	-1.29	1067.143	Fuel capacity = 10 hours
Controls	Basic	-1	0	Included in Chassis Price
Communications	Class II	-0.02	1000	Very Distant (50 km)
Accommodations	Control Cabin, Standard	-72	20000	2 Crew (1 Pilot, 1 Engineer)
	Standard Staterooms (x5)	-240	2500000	
Cargo		-272.85		
TOTALS		0	2998267.143	Cr2,698,450 with Std Design Discount

TL4 Steamship

Using a closed 200-ton chassis (40 Hull, 40 Structure [Personal Combat Scale], 4 Hull, 4 Structure [Space Combat Scale], Armor 2), the Steamship is a seafaring watercraft that transports people and supplies to various ports of call over large bodies of water. It carries an External Combustion power plant, Code B, and a Screw Propeller propulsion system, Code B, giving a top speed of 40kph, a cruising speed of 30kph and an Agility DM of -5. 200 kiloliters of coal support the power plant for 10 days. There is an extended control cabin for 5 crew members and 8 standard staterooms. This vehicle has a galley that can serve 15 people. Cargo capacity is 43.1 tons. The vehicle requires a crew of five: one Captain, one Pilot, one Navigator, one Engineer, and one Steward. The vehicle can carry ten passengers in five standard staterooms, or eleven passengers if the Captain is willing to share his stateroom. The vehicle costs KCr5,730.030 (including discounts and fees) and takes 44 weeks to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	2400	2000000	200-ton Hull
	Configuration			Closed
Power Plant	Ext. Combustion	-1134	19200	Code B (Ship Drive)
Propulsion	Screw Propeller	-32.4	200000	Code B (Ship Drive)
Fuel	Coal	-200	108000	Fuel capacity = 240 hours
Controls	Basic	-1	0	Included in Chassis Price
Accommodations	Control Cabin, Standard plus Extended	-216	30000	5 Crew (1 Captain, 1 Pilot, 1 Navigator, 1 Engineer, 1 Steward)
	Standard Staterooms (x8)	-384	4000000	
Additional Components	Galley (15 people)	-24	9500	
Cargo		-516.6		
TOTALS		0	6366700	Cr5,730,030 with Std Design Discount

TL6 Submersible

Using a closed 100-ton chassis (20 Hull, 20 Structure [Personal Combat Scale], 2 Hull, 2 Structure [Space Combat Scale] , Armor 2), the Submersible is an underwater vehicle that transports people and supplies to and from underwater locations, such as domed cities, while avoiding surface weather conditions for safety and convenience. This vehicle has the Submersible chassis option. It carries a Fission power plant, Code C, and a Screw Propeller propulsion system, Code C, giving a top speed of 40kph, a cruising speed of 30kph and an Agility DM of -5. 7.68 kiloliters of radioactives support the power plant for 12 weeks. This vehicle is equipped with Basic controls and a Class III communication system (Regional). This vehicle comes equipped with Autopilot (Submarine-0). There is an extended control cabin for 5 crew members and 8 standard staterooms. This vehicle has one airlock, a galley that can serve 15 people, both hostile and vacuum environmental protection systems, and extended life support (15 people for up to 90 days). Cargo capacity is 45.022 tons. The vehicle requires a crew of five: one Captain, one Pilot, one Navigator, one Engineer, and one Steward. The vehicle can carry ten passengers in five standard staterooms, or eleven passengers if the Captain is willing to share his stateroom. The vehicle costs KCr31,194.670 (including discounts and fees) and takes 36 weeks to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	1200	3000000	100-ton Hull
	Configuration			Closed
	Options		15000000	Submersible
	Environmental Protection (Hostile)	-3	0	
	Environmental Protection (Vacuum)	-3	12000000	
Power Plant	Fission	-86.4	96000	Code C (Ship Drive)
Propulsion	Screw Propeller	-21.6	100000	Code C (Ship Drive)
Fuel	Radioactives	-7.68	63744	Fuel capacity = 2016 hours
Controls	Basic	-1	0	Included in Chassis Price
	Autopilot		2000	Submarine-0
Communications	Class III	-0.05	2000	Regional (500 km)
Accommodations	Control Cabin, Standard plus Extended	-108	30000	5 Crew (1 Captain, 1 Pilot, 1 Navigator, 1 Engineer, 1 Steward)
	Standard Staterooms (x8)	-384	4000000	
	Extended Life Support (15 People)	-9	157500	
Additional Components	Galley (15 people)	-24	9500	
	Airlock	-12	200000	
Cargo		-540.27		
TOTALS		0	34660744	Cr31,194,670 with Std Design Discount

CHAPTER 6: UNCOMMON VEHICLES

This section describes some of the uncommon vehicles that might be encountered in ***Cepheus Engine*** campaigns. These are not the only types of vessels that exist, and creative Referees are encouraged to integrate ships of their own creation or from other sources as they see fit.

TL8 Tunnel Boring Machine

Using a closed four-ton chassis (0 Hull, 1 Structure, Armor 3), the Tunnel Boring Machine is a machine used to excavate tunnels with a circular cross section through a variety of soil and rock strata. It carries a Gas Turbine engine, Code G, and a Mole propulsion system, Code G, giving a top speed of 100 meters/hour, a cruising speed of 75 meters/hour and an Agility DM of -4. 0.68 kiloliters of hydrocarbons support the power plant for 2 days. This vehicle is equipped with Basic controls, a Class II communication system (Very Distant), Standard sensors (DM -2), and a Model 1 computer. There is one extended cockpit. The tunnel boring machine is equipped with hostile environmental protection and 10 days of basic life support. Cargo capacity is 14.79 kiloliters. The vehicle requires a crew of one: the pilot. The vehicle can carry up to one other passenger in the extended cockpit. The vehicle costs KCr282.650 (including discounts and fees) and takes 36 hours to build.

Design Specifications

Category	Component	Spaces	Price(Cr)	Notes
Chassis	Base	48	6250	Code 8
	Configuration			Closed
	Environmental Protection (Hostile)	-3	240000	
Power Plant	Gas Turbine	-4.5	637.5	Code G
Propulsion	Mole	-14	54600	Code G
Fuel	Hydrocarbons	-0.68	561.744	Fuel capacity = 48 hours
Controls	Basic	-1	0	
Communications	Class II	-0.02	1000	Very Distant (50 km)
Sensors	Standard	-3	5000	Comms DM -2; Distant (5 km)
Computer	Model 1	-0.01	500	
Accommodations	Extended Cockpit	-4	2000	Two crew (pilot, passenger)
	Basic Life Support	-3	3500	Last 10 days
Cargo		-14.79		
TOTALS		0	314049.244	Cr282,650 with Std Design Discount

APPENDIX A: UPDATED COMMON VEHICLES TABLE

This table replaces the **Common Vehicles** table found in **Chapter 4: Equipment** in the ***Cepheus Engine Core Rules***.

Table: Common Vehicles

Vehicle	TL	Skill	Agi	Spd	C&P	O/C	Armor	Hull	Struc	Wpns	Cost (KCr)
Stagecoach	3	Wheeled Vehicle	+0	By animal	1 driver, 6 psgr	Closed	1	0	1	None	8.080
Steamship	4	Ocean Ships	-5	30 kph	5 crew, 10 psgr	Closed	2	40	40	None	5,730.030
Biplane	5	Winged Aircraft	-1	150 kph	1 pilot, 1 psgr	Closed	2	0	1	None	20.670
Ground Car	5	Wheeled Vehicle	+3	75 kph	1 driver, 4 psgr	Closed	2	0	1	None	6.290
Motor Boat	5	Motorboats	-2	75 kph	2 crew, 8 psgr	Closed	2	12	12	None	2,698.450
Van	5	Wheeled Vehicle	+3	75 kph	1 driver, 1 psgr	Closed	2	0	1	None	6.290
Submersible	6	Submarine	-5	30 kph	5 crew, 10 psgr	Closed	2	20	20	None	31,194.670
Helicopter	7	Rotor Aircraft	+0	187.5 kph	1 pilot, 7 psgr	Closed	3	0	1	None	154.810
Hovercraft	7	Rotor Aircraft	+0	75 kph	1 pilot, 15 psgr	Closed	3	1	2	None	144.660
Twin Jet Aircraft	7	Winged Aircraft	-1	562.5 kph	1 pilot, 7 psgr	Closed	3	1	1	None	736.110
Air/Raft	9	Grav Vehicle	+0	75 kph	1 pilot, 3 psgr	Open	3	0	1	None	94.340
Destroyer	9	Ocean Ships	-3	45 kph	9 crew, 19 gnnrs, 20 psgr	Closed	6	160	160	See description	51,521.940
Grav Tank	9	Grav Vehicle	+1	375 kph	1 pilot, 1 gnnr, 12 psgr	Closed	9	1	2	Beam Laser-TL 9	1,469.400
Speeder	9	Grav Vehicle	+2	750 kph	1 pilot, 1 psgr	Closed	3	0	1	None	330.250
Grav Floater	11	Grav Vehicle	+2	75 kph	1 pilot	Open	4	0	1	None	30.580
AFV	12	Tracked Vehicle	-1	50 kph	1 driver, 1 gnnr, 6 psgr	Closed	25	2	2	Beam Laser-TL 11	287.790
ATV	12	Tracked Vehicle	-1	50 kph	1 driver, 7 psgr	Closed	5	2	2	None	154.410
Grav Bike	12	Grav Vehicle	+1	300 kph	1 pilot	Open	5	0	1	None	41.390
G/Carrier	15	Grav Vehicle	+1	1500 kph	1 pilot, 1 gnnr, 12 psgr	Closed	18	1	2	Fusion Gun-TL 15	3,138.560

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