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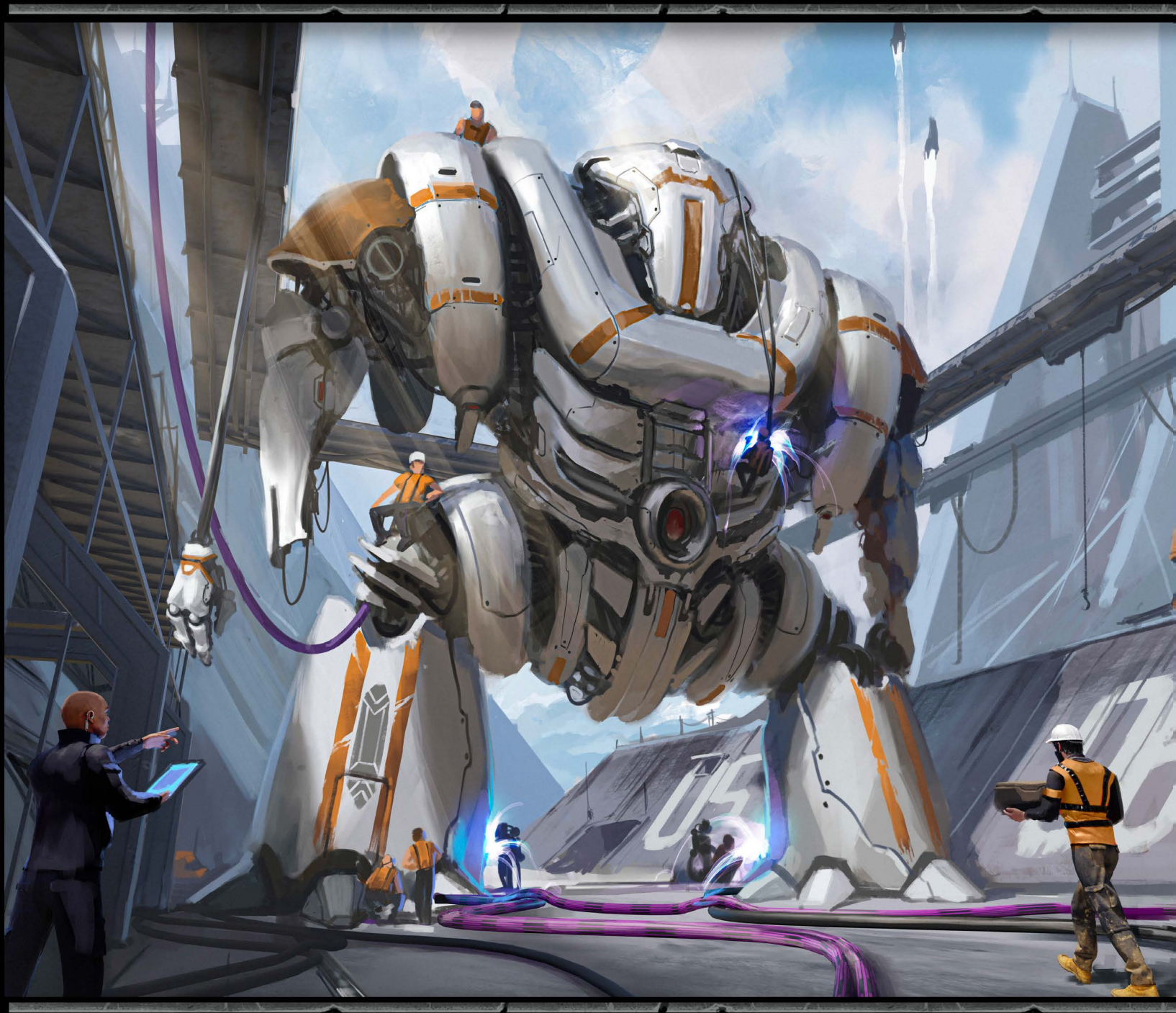
ROBOT HANDBOOK



SCIENCE FICTION ADVENTURE IN THE FAR FUTURE

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ROBOT HANDBOOK

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INTRODUCTION

A robot is an artificial being capable of reasoning and motion. It may vary in capabilities, construction or origin, but these two properties are always present, even if its reasoning is limited to simple hard-coded programming and its motion constrained to that of a single manipulator or remote control of another object.

The *Robot Handbook* uses many of the same design principles as the *Vehicle Handbook*. For the purposes of this book, size is an important factor in determining what is a robot versus what is a vehicle. The robot design sequence is focused on machines smaller than a large animal. For larger robots, the design rules of the *Vehicle Handbook* apply to any intelligent machine larger than four Spaces, although robot brains can be designed using these rules and applied to a vehicle as a zero Space option instead of a computer and possibly in place of an autopilot. Also, robots in general do not accommodate living beings as passengers, except in special cases such as autodoc medivac robots.

While the *Vehicle Handbook* and *High Guard* are useful references to have when developing specialised robots such as ship's brains, only the *Traveller Core Rulebook* is required to understand robot design and characteristics.

HISTORY OF ROBOTS

Robots are labour-saving machines that emerge as part of the technological development of most advanced races. They are good at repetitive, boring tasks and can operate in hazardous environments without risk to life. Despite these advantages, many cultures have difficulty embracing robots as part of everyday society. For some, they represent the loss of jobs, for others the fear of a 'robot revolution'. Whether these concerns are rational or not, they sometimes lead to violent opposition to the expansion of robots' roles in civilisation.

Early robots are industrial machines that conduct respective tasks, essentially a stationary manipulator working on an assembly line. Mobility requires an understanding of the local environment, incorporating optical and range-finding technologies such as radar, sonar and lidar to navigate autonomously. By TL8, Primitive and Basic robot brains allow for mobile robots, limited in flexibility but able to perform programmed functions without continual guidance from an operator or nearby biological being.

Increasing miniaturisation and sophisticated multi-processing continues to drive down the cost of robotic brains and increase their flexibility. By TL10, Advanced robot brains gain the flexibility to perform a large variety of tasks, although they fall short in understanding subtler forms of communication or unravelling complex problems. Still, as Advanced robot brains continue to evolve, they become capable of replacing biological beings in many occupations that require skilled labour.

Some societies embrace these advances; others shun it. Tradition-bound societies such as the Vilani make limited use of robots, employing them only for tasks too hazardous for humans to perform. Other societies are more open to the advantages of a larger labour pool or need to employ robots to make up for deficits in personnel; the Terran Confederation employed large numbers of support robots in the Interstellar Wars as they fought against a vastly larger empire. These robots built facilities and transported supplies but a fear of lethal robots turning upon their masters kept the Solomani from employing deadly robots – warbots – in the field. Ironically the Zhodani, who can read the minds of their biological soldiers, have no issue with deploying deadly robots to fight among their troops.

During the Second Imperium, domestic robots became widespread but the development of Very Advanced robotic brains did not begin until the early years of the Third Imperium. In 298 the megacorporation Makhidkarun produced the first Very Advanced robotic brains with the ability to perform any task as well as most humans. Continual improvement has led to robotic brains that are self-aware, believing themselves to be fully conscious; however, most roboticists believe they still lack the true 'spark' of sentience. Many of these robots would disagree. Rumours of truly conscious intellects persist but these are thought to be too large to fit within the shell of a robotic body or at least within any robot smaller than a small building or large vehicle.

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SHUDUSHAM CONCORDS

The Third Imperium's outlook on robotics was formed more than a century before its founding, based on an event that occurred in -112 aboard the *Empire's Banner*, a Sylean Federation battleship. While the ship was on a goodwill tour in orbit around Fornol (in the Core) a terrorist group rigged a courier robot to self-destruct and smuggled it aboard. The robot's fuel cell detonated, killing Fornol's Premier, two ambassadors and a Sylean vice-minister, among other dignitaries and crew. The event nearly led to a Sylean civil war.

The resulting conference between a dozen Sylean worlds was held on the neutral world of Shudusham, leading to the drafting of the Shudusham Concords in -110. The Concords limited weaponry carried by robots and their use as instruments of war. The treaty contains seven articles governing the programming of robots, weapons control systems and detailed regulation of weapons in those instances allowed. Eventually the Concords acquired 43 amendments, including the 37th Amendment, which prohibits a 'pseudobiological' or android robot from impersonating a living being.

Technically, the Concords lost the force of law in Year 0 when Cleon I declared the Third Imperium and the Sylean Federation ceased to exist, however many worlds within the Imperium continue to base their robot regulations on the Concords. One principal that remains in force on nearly all those Imperial worlds with written regulations regarding robots is the principal that robots are property and the responsibility of each robot's legal owner for any actions the robot takes and any intentional or otherwise consequences of those actions.

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ROBOTS ACROSS CHARTED SPACE

In Charted Space, robots are ubiquitous devices common to nearly every industrialised civilisation with computing technology. The acceptance of robots within a civilisation varies greatly, with some cultures treating them as just a new form of tool and others with greater reservations, whether from the threat to worker livelihood, fears of some future 'robot apocalypse' or misgivings over the use of autonomous lethal military machines.

While use and acceptance of robots differs greatly, no major society has considered even advanced robots as anything other than tools and property. While advanced robots can emulate the behaviour of sentient beings, they are generally considered non-sentient and afforded few, if any, rights. As research into full-conscious artificial intelligences progresses, questions of robots' rights may emerge but for now robots are fancy tools, rumours of fully sentient artefacts of the Ancients notwithstanding.

The robots of various races and polities outside the Third Imperium and their cultural perceptions and acceptance of robots are detailed in separate sections of the Robot Catalogue.

THE THIRD IMPERIUM

The Third Imperium has no one law or policy regarding robots, although the legacy of the Shudusham Concords and old Vilani legends of the Ancients' war machines cast a shadow over most member world's laws. None of the Imperium's armed forces use lethal robots in the field. Although smart missiles and autonomous defence systems are widespread, the use of warbots or other directly lethal war machines is contrary to doctrine. Robots are mostly used in support roles such as logistics and construction.

Across the Third Imperium, service and utility robots occupy low and semi-skilled roles in many industries. Hazardous environments particularly see widespread use of drones and robots, reducing risk to biological workers.

MAJOR MANUFACTURERS

There are literally millions of robot manufacturers across Charted Space, ranging from workshops in the back alleys of startowns to the vast manufacturing complexes of megacorporations some of which may encompass whole cities or honeycomb entire asteroids. Robots with wide distribution are normally produced by megacorporations, but these firms aim for broad markets, achieving low cost and consistent quality by producing millions of units of each design. The megacorporations with robots as a major market focus include Naasirka, Makhidkarun and Ling Standard Products.

In quantity, Naasirka is the largest manufacturer of robots in the Third Imperium and perhaps of all Charted Space. Naasirka robots are available for nearly every function. They are fairly reliable but not particularly innovative, concentrating on mass production and common components to achieve economies of scale and using Naasirka's aggressive marketing to drive up sales.

The megacorporation Makhidkarun is as ancient as Naasirka but focuses on entertainment and luxury goods. Its computer and software division long ago branched into robotics and became a pioneer of Very Advanced and Self-aware robot brains. Makhidkarun remains an innovative producer of complex brained robots, targeting the high-end consumer market.

Ling Standard Products (LSP) manufactures a wide range of robots. These robots are not elegant or sophisticated but are reliable, with a focus on industrial and utility robots capable of undertaking hazardous and tedious tasks.

SPECIALITY FIRMS

Most speciality firms focus on a single niche or small subset of the robotics market, hoping to stand out from the heavily marketed Naasirka products. Many are regional in scope, their factories shipping within at most a domain or sector of the Imperium. One such firm is Spinward Specialities, which focuses on heavily armoured courier robots, all with a contoured streamlined chassis to suggest speed and class.

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The best-known speciality firm is the Shinku University Research Directorate or SURD, an innovative producer of pseudobiological or android robots in the Core, combining life-like appearance with sophisticated robotic brains. Beginning as a research organisation, their products often have a prototype-like feel but command high prices for their limited production runs. The four-century-old manufacturer is growing under the guidance of professional managers, expanding product lines and market scope as their products begin to appear in the distant corners of the Imperium.

ROBOT BRAINS

In nearly all instances, robots are machines that move under their own volition but their defining characteristic is not shape or locomotion but their brains. The brain determines the robot's capabilities, controlling and providing meaning to its movements. A robot's brain separates it from a fancy programmed automaton or remotely controlled drone. The brain is often the most expensive component of a robot as well.

True robots appear as early as TL7 but their **Primitive** brains cannot exceed their programming in any way. A Primitive brain does what it is told to do and any contingencies or feedback are determined by preprogrammed instruction. For simple tasks, such as tracking a target, Primitive brains remain in production even as more advanced options become available because they are inexpensive and behave in a predictable manner.

The **Basic** brain, first available at TL8, is a massive improvement that incorporates 'machine learning' in its programming. This allows the robot to 'learn' from experience, albeit in a limited form, with much of its behaviour still carefully programmed and its 'learned' behaviour little more than a decision tree based on statistical analysis of a data set. The Basic brain is limited to a core function and has no general intelligence or capability for 'common sense'. It interprets data and makes decisions but has no real understanding of what it is doing. The **Hunter/Killer** brain is a derivative of the Basic brain focused on security and military applications, capable of determining friend from foe using user-defined criteria that can be altered via later input. In any case, a Basic or Hunter/Killer brain is as advanced as a smart insect or dumb reptile. As technology advances, these brains become cheaper and slightly more intelligent but they remain focused on narrow tasks.

The **Advanced** robot brain is available at TL10 and represents a massive step forward. The miniaturisation of millions of individual computing elements makes true learning possible within a package small enough to fit inside a robot's body. An Advanced brain allows a robot to fully communicate in natural language and improvise solutions in real time. It gives no thought to the 'why' of an action but has the capability to make autonomous decisions and learn from experience in a manner that gives it limited 'common sense'. The Advanced robot is still a very literal being and may act inappropriately or fail to act in unexpected situations.

The major development first pioneered by Makhidkarun in 298 was the development of the **Very Advanced** robotic brain. This brain approaches the complexity of a biological brain in its number of connections. It does not allow for full sentience – at least as defined by most scholars – but allows for complex reasoning. Robots with Very Advanced brains can attempt tasks outside their programmed functions and develop opinions and beliefs based on experience and reasoning. Synaptic pathways designed for maximum efficiency are in some ways more efficient than those developed by the trial-and-error evolutionary method, and robots with Very Advanced brains are capable of both biological-like higher reasoning and the memory and computational power of computers, making them better at certain tasks than biological beings.

The most advanced robotic brains available in the Imperium are the **Self-aware** brains first produced by researchers in association with SURD. Few production models are equipped with Self-aware brains for a number of reasons, including their recent development, high costs and lingering questions over sentience. Most roboticists do not consider a Self-aware robot brain to be fully conscious, pointing to differences between these brains and large experimental mainframe units whose processing arrays match human neural cell quantities and connections. Philosophers and ethicists dispute these assertions based on behavioural analysis and testing results, pointing out that nearly half the recognised sophont races within the Imperium would fail to meet these roboticists' standards.

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Robot Design

The major components of a robot design are size, locomotion and brain. Determining these characteristics and installing a few options and skill packages allows for the rapid design of a standard robot. While not required for complete robot design, modifications to the characteristics, options and skill packages allow for considerable additional adjustments to make a unique robot with special attributes.

This design system is not based on exact volumes and masses but on the assumption that certain standard configurations apply and only deviations from those standards require detailed design work.

The core design principles are:

- **Size:** Based on its Size, a robot body has a certain number of Slots to be used for physical equipment options.
- **Locomotion:** A robot body has a cost and traits based on its primary locomotion capability. A robot may also be immobile or have multiple modes of locomotion. Primary locomotion without options or enhancements has no Slot cost.
- **Brain:** All robots have a brain included. The initial brain normally incurs no Slot cost, though options applied to it might, and certain robot Sizes might have limited brain capability at some Tech Levels. Brains provide Bandwidth for skill packages and Intellect enhancements.
- **Default Suite:** All standard robots have a default set of five Zero-Slot options to provide sensory input and communications capability. These can be optionally upgraded, altered or replaced.
- **Physical Options:** Features or accessories can be added based on available Slots. Items requiring no Slots such as coatings and small equipment are available at additional cost, limited only by the robot's Size and Tech Level.
- **Skill Packages:** Software to provide the robot with skills is available based on Brain complexity and Bandwidth.

Additionally, these core principles assume certain design generalisations:

- A robot 'head' is an assumed feature for design purposes. Unless removed in a robot description, a 'head' in the form of a movable cluster of sensory and communications capabilities is assumed to exist.
- Robots are assumed to have two manipulators of appropriate size for their bodies by default but this can be modified by addition, deletion or resizing.
- Most basic traits and options can be enhanced (or degraded) by additional design customisation.
- Special robot types, including drones, microbots, nanorobots, androids, biological robots and other artificial beings follow their own specialised design processes derived from these standard principles.
- Larger vehicles with brains, including those designed using the *Vehicle Handbook* or *High Guard,* are physically created using the rules in those books but can use modified versions of the brain design process in this book.

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DESIGN OVERVIEW

The robot design process consists of the following steps.

STEP 1: CHASSIS SIZE

Determine the physical size of the robot from Size 1 (rat-sized) to Size 8 (rhino-sized). Physical size determines the number of physical option Slots a robot has available as well as the Base Hits and attack roll DMs for a robot of this Size. Size modifies the Cost of the robot, although not necessarily in a linear manner, as miniaturisation costs often counter savings in material. Each chassis includes a Default Suite of sensory and communication functions, two manipulators of appropriate size and an internal power system, all of which can be modified later in the process.

STEP 2: LOCOMOTION

Determine the primary method of locomotion for the robot. Locomotion options include wheels, tracks, walker and grav, among others. The selected locomotion type modifies the Base Cost of the robot and even the smallest robots require a certain amount of equipment and control circuitry to allow for locomotion. Basic locomotion modes have various traits, including Flyer and ATV, which are compatible with traits in the *Vehicle Handbook*. Robot locomotion generally occurs at ground scale and speeds; but additional options may allow a robot to achieve high speed movement similar to vehicles.

STEP 3: PHYSICAL OPTIONS

Physical options are grouped into seven categories:

- **Chassis Modifications:** Whole-body options that alter characteristics or performance of a robot.
- **Locomotive Modifications:** These affect the movement and speed of a robot.
- **Manipulator Modification:** These alter, add or subtract manipulators or allow legs to become manipulators.
- **Default Suites:** A list of Zero-Slot options that provide sensory and communication capabilities.
- **Zero-Slot Options:** Small options that provide additional capabilities. Zero-Slot options are not infinite; in addition to the five Zero-Slot options of the robot's Default Suite, a robot design may incorporate Zero-Slot options equal to its Size plus its build Tech Level. Beyond Default (5) + Size + TL any additional Zero-Slot options require one Slot each.
- **Slotted Options:** Larger features or equipment that consume Slots.
- **Weapons:** These may be installed into weapon mount options as part of the robot.

STEP 4: ROBOT BRAIN

All robots have a brain. A robot's brain determines its capacity to understand and react to its environment, and its ability to perform tasks. Different brains have different purposes and capabilities. Optional alterations may increase the capabilities of more advanced brains, adding Bandwidth or Intellect.

STEP 5: SKILL PACKAGES

Choose software packages that provide skills or additional capabilities based on the robot's brain, Bandwidth and Tech Level.

STEP 6: FINALISATION

The robot design system abstracts the shape of a robot into Size and method(s) of locomotion. Additional options may modify these basic properties but often in an abstracted manner. The designer should describe the general shape of the robot – be it a humanoid mechanical being or a floating ball with myriad tentacles or some other form – in a manner consistent with the design components chosen.

Finalisation includes filling out the robot statistics block, listing such characteristics as Hits, Speed, TL, Cost, Skills, Attacks, Traits and Programming. At the designer's discretion, Cost can be modified – usually downward – to two significant digits and includes discounts based on the ubiquity of the robot design and its role in society.

ROBOT TRAITS

The traits associated with robot design are similar to those described in the *Traveller Core Rulebook,* Page 84.

- **Alarm:** When panicked or under threat, the robot emits a loud sound, a recorded message or makes a bright visual display, alerting others to the danger. The alarm may include electronic messaging to a central command post or to other robots, alerting them to the threat and enabling them to take appropriate action.
- **Amphibious:** The robot is equally at home on land or in water. It does not suffer water damage while submerged and its movement is less affected underwater. Robots with only an aquatic locomotion system are not automatically amphibious as they may not be able to operate on land.
- **Armour (+X):** The robot has thick layers of physical protection. It has an armour Protection score equal to the figure shown in the Armour trait. Nearly all non-biological robots have some inherent armour protection unless an outer covering is intentionally omitted or weakened.

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- **ATV:** The robot can handle difficult terrain. It receives DM+2 on checks to handle rough terrain. If it is a walker, this robot has biological-like flexibility to navigate hazards such as loose rocks, underbrush and fallen trees.
- **Flyer (X):** The robot has propellers, thrusters, grav drives or some other method of gaining altitude and sustaining flight. When flying, it may travel at a maximum Speed Band listed in the Flyer trait. Without special options, a flying robot operates at human-like speeds and has the Flyer (idle) trait.
- **Hardened:** The robot's brain is immune to ion weapons. Additionally, all radiation damage inflicted on the robot is halved.
- **Heightened Senses:** The robot has better hearing and sight than humans. It receives DM+1 to Recon and Survival checks.
- **Invisible:** The robot is essentially invisible across the electromagnetic spectrum through the use of active visual camouflage technology. Attempts to spot the robot are made at DM-4.
- **IR Vision:** The robot can sense its environment in the visual and infrared spectrum, allowing it to detect heat sources in the dark. It cannot detect objects in a dark environment where there is no temperature differential.
- **IR/UV Vision:** The robot can sense its environment at a greatly extended electromagnetic range, encompassing at least infrared to ultraviolet wavelengths and perhaps beyond, such as into microwave, radio or x-ray wavelengths. This allows it to see clearly in darkness and, at the Referee's discretion, it may notice certain electromagnetic emissions from the equipment of Travellers.
- **Large (+X):** The robot is larger than a human and presents a huge target. All ranged attacks made against the robot gain a DM equal to the score listed in the Large trait. Robots of Size 6+ are Large.
- **Small (-X):** The robot is smaller than a human and presents a difficult target. All ranged attacks made against the robot suffer a DM equal to the score listed in the Small trait. Robots of Size 4- are Small.
- **Stealth (+X):** The Stealth trait, as opposed to to the Stealth skill, is the robot's ability to evade detection by electronic sensors such as radar or lidar. In addition to the inherent DM indicated (+X), Stealth applies a negative DM to Electronics (sensors) checks equal to the difference between the robot's TL and that of the device it is trying to evade.

DESIGN WORKSHEETS

A designer can use one of the design worksheets, available in this book or as downloads, to aid the build process. For complex robots with many options the full Robot Design Worksheet is most useful but for simpler robots, the Short Design Worksheet version is adequate. In either case, the back portion of the worksheet is a robot design block, allowing the designer to provide information in a format used by this book and other *Traveller* publications.

The example robot designs provided throughout the following sections use these worksheets.

EXAMPLE ROBOT DESIGNS

Each design chapter ends with a discussion of two example robots.

Steward Droid: Designed using the Short Design Worksheet, this is a straightforward small humanoid robot designed to act as a qualified steward aboard a starship or as an all-around household butler. The Steward Droid is designed and built at a TL12 facility.

StarTek: After returning from a trip to the Aslan Hierate, the designer has become enamoured by the highly capable Hikare' Technician robot used as a replacement for a female engineer on some Aslan vessels. Designed using the Robot Design Worksheet, the StarTek is a human-produced robot based on the Hikare' design concept. A very sophisticated robot, StarTek is built and designed at a TL14 facility.

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Robot Name:

Characteristic	Value	Slots	Effect		Traits	TL =		Cost
Chassis Size			Hits =			Basic Cost:		
Locomotion Type			Agility =			Multiplier: X		

Chassis Modifications									Skill	
Armour	Base =				Total =					
Efficiency					Endurance =		Hours			
Power Packs					Endurance =		Hours			
Resilient Chassis					Hits: +					
Light Chassis					Hits: –		Total Hits =			

Locomotion Modifications									
Agility +			Final Agility =						
Tactical Speed ±			Final Speed =		Final Endurance =		Hours		
Vehicle Speed?			Vehicle Speed Band =						
Enhancement:			Final Speed Band =						
Secondary Locomotion?			Traits =						

Manipulators (including modified legs)

#	Size	STR	DEX	Slots	STR Mod/Final(DM)	DEX Mod/Final(DM)	Skill	Cost
1								
2								
3								
4								
5								
6								

Default Suite (5 Zero-Slot Items)

Item	Slots	Notes	TL	Traits	Skill	Cost

Physical Options

Item	Slots	Notes	TL	Traits	Skill	Cost

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Weapon	TL	Range	Damage	Magazine	Cost	Traits	Cost

Robot Brain Type	Slots	TL	Bandwidth	Base INT	Skill DM	Capabilities	Cost

Bandwidth Upgrade: +				Adjusted Bandwidth =		Zero Bandwidth Skills =	
Intellect Upgrade: +				Adjusted INT =		Adjusted Bandwidth =	
Brain Hardening (/fib)				Trait:000			

Skill Package	Level	TL	Bandwidth	Characteristic/Trait	Adjusted Skills	Cost
					Total Cost:	

Name:

Description:

Robot	Hits	Locomotion	Speed	TL	Cost
Skills					
Attacks					
Manipulators					
Endurance					
Traits					
Programming					
Options					

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Robot Name:

Characteristic	Value	Slots	Effect		Traits	TL =		Cost
Chassis Size			Hits =			Basic Cost:		
Locomotion Type			Agility =			Multiplier: X		

Chassis Modifications								Skill	
Armour	Base =				Total =				
Efficiency					Endurance =		Hours		
Power Packs					Endurance =		Hours		
Resilient Chassis					Hits: +				
Light Chassis					Hits: –		Total Hits =		

Locomotion Modifications							
Agility +		Final Agility =					
Tactical Speed ±		Final Speed =		Final Endurance =		Hours	

Manipulators (including modified legs)

#	Size	STR	DEX	Slots	STR Mod/Final(DM)	DEX Mod/Final(DM)	Skill	Cost
1								
2								

Default Suite (5 Zero-Slot Items)

Item	Slots	Notes	TL	Traits	Skill	Cost
Visual spectrum sensor						
Voder speaker						
Audible sensor						
Wireless data link						
Transceiver, 5km (improved)						

Physical Options

Item	Slots	Notes	TL	Traits	Skill	Cost

Weapon	TL	Range	Damage	Magazine	Cost	Traits	Cost

Robot Brain Type	Slots	TL	Bandwidth	Base INT	Skill DM	Capabilities	Cost

Bandwidth Upgrade: +				Adjusted Bandwidth =		Zero Bandwidth Skills =	
Intellect Upgrade: +				Adjusted INT =		Adjusted Bandwidth =	
Brain Hardening (/fib)				Trait:000			

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ROBOT DESIGN WORKSHEET (SHORT FORM)

Skill Package	Level	TL	Bandwidth	Characteristic/Trait	Adjusted Skills	Cost
					Total Cost:	

Name:

Description:

Robot	Hits	Locomotion	Speed	TL	Cost
Skills					
Attacks					
Manipulators					
Endurance					
Traits					
Programming					
Options					

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CHASSIS

A robot requires a body. Without physical form, a robot is just a piece of software performing tasks without directly interacting or moving through its physical environment. For the purposes of these design rules, general purpose robots range in size from a rat to a rhinoceros, from a kilogram to a few tons, or in terms of vehicle design, up to four vehicle Spaces in size. Anything larger is considered to be – and is physically designed as – a vehicle, though such larger designs may be fitted with a robot brain. Anything smaller is considered a microbot (insect-sized) of limited capability, or a nanorobot (microbe-sized), a single purpose robot commonly deployed in swarms. Microbots and nanorobots are considered in separate sections, beginning on page 105.

SIZE

Size determines the Basic Cost, physical capacities and traits of a robot. The **Base Slots** value indicates the physical option Slots available to the robot. Unused Slots may be reserved as spare Slots for future use or may be permanently removed at design time to lower the Cost of a robot but the Base Slots value remains unchanged for determining the Cost of most full-chassis robot options.

The Base Hits value indicates the default damage absorption capacity of the robot. Customisation may increase or decrease the Hit capacity of a robot. When a robot's Hits reach 0, it is inoperable and considered wrecked, or at least cannot be easily repaired; at cumulative damage equal to twice its Hits the robot is irreparably destroyed. The Attack Roll DM indicates the difficulty of hitting the robot based on its Size. This also corresponds to the robot's Large (+1 or more) or Small (-1 or less) trait.

A robot is assumed to have two standard manipulators proportionally sized to its chassis and may or may not have a head. These features are considered part of the chassis of the robot and its actual physical form. While important to the aesthetics and description of the robot, these details do not influence its Cost or characteristics and are left to the imagination of the designer.

Although unused Slots are often reserved for future use, they can be permanently removed during the design process. Permanent Slot reductions will *not* lower the Slots required for 'per Slot' options such as coatings and environmental protections, and are noted at the end of the Slotted options record. Each Slot permanently removed at design time will lower the robot Cost by Cr100 and these cannot be restored by post-design modifications. However, the minimum cost for any robot is its Basic Cost.

Robot Size

Size	Base Slots	Base Hits	Attack Roll DM	Equivalent Size	Equivalent Vehicle Spaces	Basic Cost
1	1	1	-4	Rat	0	Cr100
2	2	4	-3	Cat	0.02	Cr200
3	4	8	-2	Dog	0.1	Cr400
4	8	12	-1	Bwap, Droyne, Goat	0.25	Cr800
5	16	20	+0	Human, Vargr, Dolphin	0.5	Cr1000
6	32	32	+1	Aslan, Cow, Lion	1	Cr2000
7	64	50	+2	K'kree, Bear, Shark	2	Cr4000
8	128	72	+3	Virushi, Rhino, Orca	4	Cr8000

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SIZE, SLOTS, SPACES AND TONS

Size and Slots are not precise measurements but abstractions of physical dimensions. Slots represent available space for customisation after the robot's basic 'guts' are assembled. For the purposes of determining the true dimensions of a robot, for instance if one robot carries another within it or attempts to use a fabricator to create another robot, a robot is considered to occupy twice the number of Slots as it can use – a Size 5 robot has 16 Slots available but another 16 Slots comprise its basic structure, making the robot itself 32 Slots in size. The equivalent *Vehicle Handbook* Spaces of a robot is listed on the Robot Size table. Note that while a human-sized robot is only 0.5 Spaces in physical dimension, a seat for a human requires a full Space (64 Slots): half for the human, half for the seat and access to it.

A spacecraft ton – approximately 14 cubic metres – is the equivalent of four Spaces or 256 Slots. Of course this would make a Space equal to more than 54 litres of volume but only if all Spaces were perfect cubes. Both the *Vehicle Handbook* and *Robot Handbook* use an abstract design system that allows for straightforward design of vehicles, robots and other objects without resorting to 3D design software and assumptions about clearance buffers and a myriad of other factors that prevent objects from being crammed together without any wasted space.

Using this 256-Slot extrapolation, a corresponding ship ton is equal to a Size 8 robot (128 x 2). If designed with wings or as a multilegged robot low to the ground, it could require up to two ship tons for storage and access however, for instance, a Size 7 autodoc or low berth is designed to fit compactly on a ship and requires only 0.5 tons. Four Size 5 humanoid robots could be squeezed into a closet of 0.5 tons in a fashion that would allow only one robot to emerge at a time. Such an arrangement would be intolerable for a living humanoid but consider the emergency low berth, which crams four individuals and life support systems into a single ton.

A robot Slot is assumed to be able to hold the equivalent of an object massing around three kilograms or at least three litres in actual volume. This is a rough number. For instance, a small weapon mount, requiring one Slot, can hold any handgun or melee weapon of reasonable size, although a two-handed battle axe would likely require a two-Slot medium mount. As with the design process in the *Vehicle Handbook*, to avoid detailed design procedures requiring precise dimensions and blueprints, a certain amount of compromise and common sense is required.

Conny Delshagen (Order #42562827)

EXAMPLES

Steward Droid

The Steward Droid design concept is for a humanoid robot operating in an environment built for humans. However, the robot is not likely to have a need for many added features requiring Slots, so it can be somewhat smaller than the standard human. The designer envisions the robot as short and thin but with long thin arms capable of reaching high shelves or scooping items off the floor. The robot is smaller than human-sized, or Size 4, with 8 Base Slots and 12 Base Hits. A Size 4 chassis has a basic cost of Cr800. Its size gives it the Small (-1) trait, making it harder to hit in combat.

StarTek

StarTek is envisioned to be an engineer and mechanic on a starship. It might need to move heavy equipment and carry a variety of tools but must also fit into an environment built for humans and crawl into tight spaces. While the Aslan version of this robot is larger than a human, it is not suitable for use on human-designed ships. Therefore, StarTek is Size 5 with 16 Base Slots and 20 Base Hits. A Size 5 chassis has a basic cost of Cr1000 and has no size-related traits. The designer envisions the robot as a broad-shouldered humanoid with a blunt head.

Robot Name: STEWARD DROID

Characteristic	Value	Slots	Effect		Traits	TL	12	Cost
Chassis Size	4	8	Hits =	12	Small (-1)	Basic Cost:	800	800

Robot Name: STARTEK

Characteristic	Value	Slots	Effect		Traits	TL	14	Cost
Chassis Size	5	16	Hits =	20		Basic Cost:	1000	1000

Conny Delshagen (Order #42562827)

Locomotion

Robots are by definition mobile devices. Some exceptions to this are stationary robots that perform tasks with manipulators and emplaced command unit robots, which remotely control drone subunits. The number of locomotion units – whether wheels or legs or propellers – is an aesthetic detail left to the discretion of the designer, however designs with more than eight legs, axles or thrusters may optionally require additional Slots or cost. A robot may optionally have multiple forms of locomotion if Slots and cost are dedicated to them. When designing a vehicle, the most expensive cost multiplier is applied to the basic cost first and any additional locomotion options are added as described in the Secondary Locomotion section on page 23.

A choice of 'None' for locomotion adds 25% to the robot's available Slots, rounded up. This does not increase the Base Slot number used to determine coatings and other options but is one of the methods a robot designer may use to obtain more than its Base Slot value available for options.

A locomotion system includes dedicated sensors that enable the robot to navigate a cluttered environment and avoid collisions. These include secondary video sensors, short range radar or lidar emitters and acoustic emitters and equipment tied to the locomotion system. For simplicity, these are not treated separately from the locomotion system and not related to sensors installed on the robot for general use. Most robots are equipped with a transceiver or wireless data link to communicate with compatible buildings or other robots to aid in navigation within structures, in urban environments, along roads and potentially across a highly civilised world's surface.

A robot's base Agility is determined by its locomotion type. Agility is a factor in determining a robot's movement rate, modifying a robot's base movement rate of five metres per Minor Action in every six-second combat round. Traits are similar to vehicle Traits and described on Page 101. Traits for some locomotion types may be modified during the design process. Base Endurance indicates the duration in hours a robot can function without recharging. Endurance can be modified during the design process by a variety of factors, including Tech Level, efficiency, power packs and various speed modifications.

The Cost Multiplier for locomotion is applied to the basic cost of the chassis Size to determine the **Base Chassis Cost**, an important value in some robot modification options.

Robot Locomotion

Locomotion	TL	Agility	Traits	Base Endurance	Cost Multiplier
None	5	—	—	216 hours	x1
Wheels	5	+0	—	72 hours	x2
Wheels, ATV	5	+0	ATV	72 hours	x3
Tracks	5	-1	ATV	72 hours	x2
Grav	9	+1	Flyer	24 hours	x20
Aeroplane	5	+1	Flyer	12 hours	x12
Aquatic	6	-2	Seafarer	72 hours	x4
VTOL	7	+0	Flyer	24 hours	x14
Walker	8	+0	ATV	72 hours	x10
Hovercraft	7	+1	ACV	24 hours	x10
Thruster	7	+1	—	2 hours	x20

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LOCOMOTION SPECIAL CHARACTERISTICS:

Some locomotion types have special characteristics beyond agility, movement rate and endurance.

Aeroplane locomotion requires a runway of at least 50 metres for landing. Take-off normally requires a similar distance but Size 1–3 aeroplane robots can be launched by hand. Any aeroplane locomotion robot can be launched from a moving vehicle travelling at least Medium speed. A robot with aeroplane locomotion must include the vehicle movement speed enhancement (see page 22) to avoid stalling; it cannot travel slower than Slow. Slower flying movement requires a choice of VTOL or grav locomotion. Basic landing wheels are included but aeroplane locomotion requires some form of ground secondary locomotion system to do more than taxi on a runway.

Thruster is a special locomotive system which, unlike other modes, is generally available only as a secondary locomotion system although, for cost reasons, its primary locomotion type can be 'none'. A thruster-equipped robot's endurance is only invoked while thrusters are firing; otherwise, the robot's primary locomotion mode's endurance period applies. A standard thruster provides 0.1G acceleration if not modified, making it useful only in space or on worlds of Size 0 or 1. Missiles and torpedoes are a special class of robot that achieve higher acceleration with thrusters as both primary and secondary locomotive types and the vehicle speed movement modification selected. Rules for missile and torpedo-based robots are detailed on page 100.

VTOL or Vertical Take-Off and Landing locomotion includes helicopters with one or more rotors, ducted fan jet propulsion and tiltrotors, as well as ornithopter designs. These vehicles require some form of secondary locomotion if they are to move across the ground at all.

VTOL and hovercraft robots suffer Agility -1 in thin atmospheres but gain no benefit in dense atmospheres. At the Referee's discretion, such robots might operate in very thin atmospheres on low gravity planets at Agility -2 to -4.

LOCOMOTION TRAITS

ACV: The robot is equipped with an air cushion that allows it to ride on a layer of air for movement over both solid and liquid surfaces. The robot may not hover more than a few metres and requires at least a thin atmosphere to operate. These robots normally float if their locomotion system is shut down over water.

ATV: The robot is equipped to handle difficult terrain. This trait provides DM+2 to any checks made to negotiate rough terrain. All robots equipped with walker locomotion are considered ATVs.

Flyer (X): The robot is equipped to operate in an aerial mode at vehicle Speed Band (X). An aeroplane or VTOL robot requires at least a thin atmosphere to operate. A grav robot can operate in an airless environment but requires interaction with a gravitational field; this may be an artificial gravity field or the gravity well of a planetary-sized body but the robot requires secondary thruster locomotion to travel beyond 1,250km of a planetary body's surface. Without special options a flying robot will operate at human speeds and have the Flyer (Idle) trait.

Seafarer: This robot is equipped to operate in a liquid environment. By default, the robot operates only on the surface of a liquid. Additional options allow for submersible operation.

Thruster (X): The robot is equipped with thrusters capable of acceleration equal to (X) G. By default, secondary thruster locomotion provides 0.1G acceleration. Missile-like thruster locomotion provides 10G at TL8–13 and 15G at TL14+.

Some options apply to the entire robot, including armour, resiliency and efficiency.

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EXAMPLES

Steward Droid

The Steward Droid is intended to be humanoid in appearance, making walker the obvious choice for locomotion. Walker grants the ATV trait to the robot, no modification to Agility and no modification to the base movement speed of five metres. The walker locomotion type multiplies the chassis size basic cost by 10, making the Base Chassis Cost of the Steward Droid Cr8000.

StarTek

The StarTek robot is based on the Aslan Hikare' robot, which has both grav and walker locomotion modes. Since grav locomotion has a higher cost multiplier than walker, grav is considered the primary locomotion mode and walker is added later as a secondary locomotion mode. Grav locomotion grants the Flyer (Idle) trait to the robot and Agility +1, modifying the base movement rate to six metres. Grav locomotion multiplies the cost of the Size 5 robot by 20, resulting in a base chassis cost of Cr20000.

Robot Name: STEWARD DROID

Characteristic	Value	Slots	Effect		Traits	TL	12	Cost
Chassis Size	4	8	Hits	12	Small (-1)	Basic Cost	800	
Locomotion Type	Walker		Agility			Multiplier: X	10	8000

Robot Name: STARTEK

Characteristic	Value	Slots	Effect		Traits	TL	14	Cost
Chassis Size	5	16	Hits	20		Basic Cost	1000	
Locomotion Type	Grav		Agility	+1	Flyer (idle)	Multiplier: X	20	20000

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CHASSIS OPTIONS

ARMOUR

A robot's base armour is determined by the technology of its construction, with more advanced materials having greater resiliency. In addition to innate structure, a designer may add armour to a robot's chassis at a cost that includes use of physical option Slots.

The robot's Base Protection is its value without additional armour. Each point of additional armour, up to the listed maximum, may be obtained for the specified percentage of the robot's Base Chassis Cost and the allocation of a percentage of Slots as indicated. Slots required are always rounded up and any added armour requires at least one Slot. Additionally, since robots are relatively small compared to vehicles and armour is applied to surface area, not volume, only a certain amount of armour can be installed per Slot as indicated by the robot armour table's Maximum per Slot column. For example, there is no way a rat-sized robot can have five centimetres of armour around its entire surface; the maximum per Slot values for armour simulates this limitation.

Optionally, Base Protection can be reduced by -1 at a cost savings equivalent to 10% of the robot's Base Chassis Cost. This exposes some of the robot's internal machinery and prevents installation of additional armour or environmental protection. This has no effect on the Base Chassis Cost computation in relation to other modifications and options, and is not available to any special robot types that lack base armour.

Androids and biological robots have no default Protection and can only add a limited amount of armour as indicated in their specific robot design sequences.

ENDURANCE

A robot's Base Endurance in hours is determined by locomotion type. By default, a stationary robot can continuously operate on internal power for nine days, a ground-moving robot for three days and a flying robot for one 24-hour day. After operating for this period of time, a robot requires a full eight hours to recharge. A robot with access to a power source can recharge while operating normally, although this will tend to limit mobility. Certain options may shorten recharge time or provide auxiliary power to increase endurance.

Robots of advanced technology automatically have additional endurance. At TL12 Base Endurance is increased by 50%. At TL15 Base Endurance is increased by 100%.

A robot may also increase endurance by using more efficient components or dedicating additional space to power storage. To increase endurance by efficiency, a robot may have its endurance increased by 100% at a cost of 50% of its Base Chassis Cost. This may be done once and is applied after a TL increase.

A robot may also increase endurance with up to three additional power packs. Each power pack consumes 10% of the robot's Base Slots (round up) and increases endurance by 100%. This value is calculated after any efficiency increase. A power pack costs Cr500 per Slot consumed.

Robots whose endurance has been increased by additional power packs gain the equivalent of Athletics (endurance) skill at a level determined by the number of power packs added.

Robot Armour

TL	Base Protection	Max.	Slots	Max. per Slot	Cost per Slot
6–8	2	20	1%	1	Cr250
9–11	3	30	0.5%	2	Cr1000
12–14	4	40	0.4%	3	Cr1500
15–17	4	50	0.3%	4	Cr2500
18+	5	60	0.25%	5	Cr5000

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Endurance Modifier	TL	Slots	Increased Endurance	Athletics (endurance)	Cost
Improved Technology	12	—	+50%	—	—
Advanced Technology	15	—	+100%	—	—
Efficiency	7+	—	+100%	—	50% Base Chassis Cost
Power Packs (3 max.)	8+	10% per pack	+100%	+1 per pack	Cr500 per Slot

Resiliency	Slots	Hits	Cost
Increased Resiliency (per Hit)	1	+1	5% of Base Chassis Cost
Decreased Resiliency (per Hit)	—	-1	-Cr50 x Locomotion Multiplier

Installed power options, as described beginning on page 55, may further modify endurance and performance. Endurance for robots equipped with a radioisotope thermoelectric generator (RTG) or solar power have their endurance calculated by using the formulas described in Power Options on page 56. However, default endurance might still apply in certain situations, such as when a robot with solar power spends extended periods in darkness.

RESILIENCY

A designer may dedicate part of a robot's structure to resiliency, using compartmentalisation and redundancy to increase durability. Each Slot so dedicated increases the robot's Hits by +1 and costs 5% of the robot's Base Chassis Cost. No more than 50% of a robot's Slots may be dedicated to resiliency.

Conversely, a robot design may skimp on standard resiliency practices. A robot design may reduce costs by Cr50 times its locomotion multiplier for every Hit reduced, up to 50% of the robot's Base Hits.

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EXAMPLES

Steward Droid

The Steward Droid does not need additional armour beyond the Base Protection +4 of a TL12 design. Base Endurance of 72 hours, modified by TL12 to 108 hours, is plenty for a robot designed to operate in a civilised environment. The robot is not intended for harsh conditions or combat, so the designer chooses to lower the robot's resiliency by 2 Hits, saving (2 x 50 x 10) Cr1000 and lowering the Steward Droid's Hits from 12 to 10.

StarTek

The StarTek robot also has Base Protection +4 but may operate in hostile conditions. The designer chooses to add Protection +6 to give the robot total Protection +10. Each point of armour requires 0.4% of the robot's total Slots, or (6 x 0.004 x 16) 0.384 Slots. Normally this value would round to 1 Slot but to simulate the relatively larger impact of surface area on smaller objects, TL12–14 armour provides a maximum of Protection +3 per Slot, so the added Protection +6 requires 2 Slots. The Cost for 2 Slots of TL14 armour at Cr1500 per slot is Cr3000.

The Base Endurance for grav locomotion is only 24 hours modified by TL12+ to 36 hours, which should be sufficient for operating in a shipboard environment – except when the robot is fixing the power plant. To be safe, the designer could increase the efficiency of the robot, doubling endurance at half the Base Chassis Cost or adding power cells, each taking 10% of the robot's Slots – rounded up to 2 Slots and costing Cr1000. Adding power cells is cheaper but the designer wants to ensure the robot has enough space for onboard toolkits and Cr10000 is a minor cost for a robot with a Very Advanced brain, so the designer chooses to double endurance by increasing efficiency and forgoing the power cells. The designer does not alter the resiliency of the StarTek's chassis, trusting armour to keep the robot safe.

STEWARD DROID										Cost
Chassis Modifications								**Skill**		
Armour	Base	4			Total	4	Armour (+4)			
Efficiency					Endurance	108	Hours			
Power Packs					Endurance		Hours			
Resilient Chassis					Hits					
Light Chassis			-2		Hits		Total Hits	10		-1000

STARTEK									Cost
Chassis Modifications								**Skill**	
Armour	Base	4	+6	2	Total	10	Armour (+10)		3000
Efficiency					Endurance	72	Hours		10000
Power Packs					Endurance		Hours		
Resilient Chassis					Hits				
Light Chassis					Hits		Total Hits	20	

Conny Delshagen (Order #42562827)

LOCOMOTION MODIFICATIONS

Locomotion modifications alter the performance characteristics of a robot's primary form of locomotion and allow for the installation of a secondary locomotion mode.

AGILITY

Enhancements or restrictions to a robot's Agility affect its movement rate, its ability to manoeuvre in complex environments and to dodge attacks.

Agility Enhancement

This modification requires no Slot utilisation but increases the cost of a robot's locomotive component and grants the robot the equivalent of the Athletics (dexterity) skill. It can be used in conjunction with speed enhancements but costs are cumulative. Each level of agility enhancement grants one level of Athletics (dexterity) and increases overall Agility, increasing tactical speed movement by +1.

Tactical Speed Enhancement

This modification requires no Slot utilisation but increases the robot's cost and tactical movement rate. Each increase of one metre per round to a robot's tactical movement rate costs 10% of a robot's Base Chassis Cost. Tactical speed enhancement cannot increase a robot's tactical movement rate beyond 12 metres per Minor Action and each increase in movement rate decreases a robot's endurance by 10%. Speed enhancement cannot be used in conjunction with the vehicle speed movement modification.

Tactical Speed Reduction

This modification provides no Slot utilisation benefit but decreases the cost of a robot and decreases the robot's tactical movement rate. Each decrease of one metre per round to a robot's tactical movement rate saves a cost equal to 10% of a robot's Base Chassis Cost. Tactical speed reduction cannot decrease a robot's movement rate below 0 metres per Minor Action but each decrease in movement rate increases a robot's endurance by 10%. Tactical speed reduction cannot be used in conjunction with the agility enhancement or vehicle speed movement modifications.

Agility Enhancement	Speed	Skill	Cost of Base Chassis Cost
Agility +1	+1	Athletics (dexterity) 1	100%
Agility +2	+2	Athletics (dexterity) 2	200%
Agility +3	+3	Athletics (dexterity) 3	400%
Agility +4	+4	Athletics (dexterity) 4	800%

Tactical Speed Enhancement	Effects	Cost of Base Chassis Cost
per +1 metre movement rate	+1 metre movement rate -10% endurance	10%

Tactical Speed Reduction	Effects	Cost of Base Chassis Cost
per -1 metre movement rate	-1 metre movement rate +10% endurance	-10%

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VEHICLE SPEED MOVEMENT

The vehicle speed movement modification adds a vehicle-grade transmission and locomotion system to the robot. This option requires 25% of a robot's Base Slots (round up) and provides locomotion at a rate indicated in the Vehicle Speed Locomotion table.

The cost of the vehicle speed movement modification is equal to the Base Chassis Cost of the robot. The robot's rate of movement may be increased by one Speed Band at the expense of an additional 10% of Slots and a further doubling of cost. This may be done up to three times.

Vehicle speed movement benefits from either an autopilot or a skill package appropriate for operating that type of vehicle. The vehicle speed movement modification includes a basic skill level 0 autopilot but an additional autopilot option or a vehicle skill package is recommended to perform any complicated manoeuvres at high velocity.

Vehicle speed movement reduces a robot's endurance by a factor of four when in use. *The robot does not reduce endurance when moving at normal speed of 5 + Agility*. Each further movement enhancement halves the robot remaining endurance.

Grav locomotion systems equipped with vehicle speed movement are capable of propelling a robot to orbit. A robot with regular tactical speed grav systems could technically reach orbit of a Terra-sized world in 10 or more hours but it could never reach orbital velocity. In any case, the grav units used by robots are lifter plates capable of functioning only within 1,250 kilometres of the surface of a world or a tenth of a planetary diameter above a smaller world's surface.

See the Missile Robots section starting on page 100 for speed and range limitations of vehicle speed movement Thrusters.

Vehicle Speed Locomotion

Locomotion	Speed Band
Wheels	Slow
Tracks	Very Slow
Grav	High
Aquatic	Very Slow
VTOL	Medium
Walker	Very Slow
Hovercraft	Medium

SECONDARY LOCOMOTION

A robot may use a secondary mode of locomotion. The secondary mode's locomotion cost multiplier must be no greater than its primary mode and may not use the vehicle speed movement modification.

A robot's secondary locomotion mode requires 25% of a robot's Slots (round up) with each required Slot costing Cr500 times the secondary mode's locomotion Cost Multiplier.

Robots envisioned to have more than eight legs, axles or thrusters may be considered to have a secondary locomotion option installed. This locomotion mode must be identical to the original. Other than aesthetics, this option allows a robot to continue to function if its primary locomotion option is disabled or destroyed by a Critical Hit. If the primary locomotion mode has the vehicle speed movement, an identical secondary locomotion system is considered to have this option as well when both locomotion systems are operational. If the one system is disabled or destroyed, the robot's vehicle Speed Band is reduced by one.

FINAL ENDURANCE

Endurance is determined from locomotion type, technology, efficiency, power packs and any power options. As efficiency normally exceeds a full day, in settings where power is readily available such as a technological society or aboard a vessel, endurance can be effectively ignored. It is assumed that a robot could plug in and recharge during 'down hours'. Efficiency is the total running time of the robot and can be conserved if the robot goes into a standby 'sleep' mode. Recharging is assumed to take eight hours regardless of its endurance unless a fast charger option is installed.

To compute the robot's effective endurance before it requires a recharge, round the final result to the nearest hour. For robots with the vehicle speed movement modification and possible enhancements, note the modified lower endurance while moving at vehicle speeds in parentheses.

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EXAMPLES

Steward Droid

The Steward Droid is intended to work with humans and other species that have a movement rate of 6 metres. An increase of +1 to the robot's movement rate costs 10% of its Base Chassis Cost or a total of Cr800. This decreases the robot's endurance by 10% to 97.2 hours, rounded to 97 hours.

StarTek

The StarTek robot does not need to move faster but differently. Emulating the Aslan robot from which it was based, the StarTek has a secondary locomotion system of two legs, giving it a walker mode. The addition of a secondary locomotion option requires 25% or four of the StarTek's Slots at a cost of (Cr500 x 4 Slots x 10 walker multiplier) Cr20000. The legs grant the StarTek the ATV trait while walking.

STEWARD DROID

Locomotion Modifications							Cost
Agility		Final Agility	0				
Tactical Speed	+1	Final Speed	6	Final Endurance =	97	Hours	800

STARTEK

Locomotion Modifications							Cost
Agility			Final Agility	+1			
Tactical Speed			Final Speed	6	Final Endurance =	72 Hours	
Vehicle Speed	□		Vehicle Speed Band				
Enhancement			Final Speed Band				
Secondary Locomotion	Walker	4	Traits	ATV			20000

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Manipulators

A base robot design includes two manipulators of a size appropriate to the robot's chassis Size; by default, a chassis Size 5 robot has Size 5 manipulators. These manipulators have a default STR of 2 x Size-1 and DEX of TL/2 +1 (round up). These two manipulators are included in the Base Chassis Cost of a robot. For many robots, no further design is required for manipulators. However, manipulators may be added, resized, removed, strengthened or weakened.

Additional Manipulators

Additional manipulators cost Cr100 x Manipulator Size. This initial cost is also the basis of any characteristic-based cost modifications to the robot's base or additional manipulators.

Each additional manipulator requires 10% of a robot's Slots (round up) for the addition of one 'same-size' manipulator. Smaller manipulators can be added at a Slot expenditure of 5% for one size smaller, 2% for two sizes smaller or 1% for three or more sizes smaller.

Similarly, a robot may add manipulators of one or two sizes larger, using 20% of Slots for one size larger or 40% of Slots for two sizes larger. It is not possible to install manipulators more than two sizes above robot Size, although a robot of Size 8 may have Size 10 manipulators if so designed. Regardless of size, all additional manipulators require at least one Slot.

The cost of the manipulator is Cr100 x Manipulator Size-equivalent, not robot Size. For instance, a Size 5 robot may add a Size 4 manipulator at a cost of 5% of its Slots – rounded to one Slot – and Cr400.

To avoid computation, the Additional Manipulator Slots table provides the requirements for additional manipulators.

Altered Base Manipulators

Alterations to base manipulators are possible at design time, removing them or making one or both smaller or larger (within limits).

Removal: A robot does not require manipulators. One or both standard manipulators can be removed. Additional Slots gained for reducing manipulators are 10% of the robot's Base Slots per manipulator, rounded up to always gain at least one Slot. Removing a manipulator lowers the cost of the robot by Cr100 multiplied by the size of the robot but no more than 20% of the Base Chassis Cost.

Resizing: Changing the size of a robot's manipulators is the equivalent of removing it and adding a different sized manipulator. To calculate the Slots gained or lost by resizing, refer to the Additional Manipulator Slots Requirement table and use the size of the resized manipulator rather than the robot size, then subtract the Slot requirement for a manipulator of the robot's size.

In addition, the following rules apply: if the manipulator is smaller than the default size, it gains at least one Slot for the robot to use. If the manipulator is larger than default size, it requires at least one additional Slot to install.

Additional Manipulator Slots

Slots Required		Robot Size							
Additional Manipulator Size vs Robot Size	**% of Base Slots**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
+2	40%	1	1	2	4	7	13	26	52
+1	20%	1	1	1	2	4	7	13	26
Same Size as Chassis	10%	1	1	1	1	2	4	7	13
-1	5%	1	1	1	1	1	2	4	7
-2	2%	1	1	1	1	1	1	2	3
-3 (or less)	1%	1	1	1	1	1	1	1	2

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Resizing a manipulator changes the robot's cost by Cr100 x the difference in Slots between the robot's default manipulator size and actual manipulator size. Therefore, the cost is increased by Cr100 if the resized manipulator is one Slot larger and decreased by Cr100 if one Slot smaller. The Base Chassis Cost cannot be reduced by more than 20% by reducing manipulator size.

Altered Characteristics

Rather than increasing or decreasing a manipulator's size, it can have its STR or DEX characteristics increased. This change has an associated Cost but does not impact Slots.

Strength: Increasing a manipulator's STR costs an additional amount equal to its base manipulator cost multiplied by the square of its increase in STR. For example, a Size 5 manipulator increased from STR 9 to STR 10 (+1) costs an additional Cr500 (Cr100 x 5 x 1 x 1), while increasing the same manipulator to STR 15 (+6) requires an additional cost of (Cr100 x 5 x 6 x 6) Cr18000. A manipulator may not have its STR increased beyond twice its default value; therefore, the maximum STR of the Size 5 manipulator would be STR 18 (9 x 2 for +9) at a Cost of (Cr100 x 5 x 9 x 9) Cr40500.

Dexterity: A manipulator may have its DEX increased to a limit of its TL+3 at twice its base manipulator Cost multiplied by the square of its increase in Dexterity. For instance, at TL10, a size 5 manipulator would normally have a DEX of 12 ÷ 2 + 1 = 7 but it could be increased to 10 (+3) at a cost of Cr200 x 5 x 3 x 3 or Cr9000. DEX could be increased to a maximum of 13 (TL10+3 for a total DEX +6) at a cost of Cr36000 (Cr200 x 5 x 6 x 6).

Both STR and DEX can be increased, with the costs combined. For instance, a TL10 Size 5 manipulator increased from STR 9, DEX 7 to STR15, DEX 10 would cost (Cr18000 + Cr9000) Cr27000.

Walker Legs as Manipulators

A robot designed as a walker may enhance a leg to operate as a manipulator by paying the base manipulator cost of a robot of its Size (Cr100 x Size per modified manipulator). Multi-legged robots may have one, some or all legs altered into multi-functional limbs but their size may not be altered. For design simplicity a multi-legged walker with legs altered to become manipulators is considered to have two legs; for example, designing an eight-limbed robot with all limbs as manipulators would involve keeping the two original manipulators, adding four manipulators and altering the two default legs to become manipulators.

Manipulator Athletics Skill Requirements

Increased DEX and STR values do not directly grant a skill equivalence of Athletics (dexterity) or Athletics (strength) to the robot unless it has a skill package of Athletics installed in its brain. If such a package is installed, even at skill level zero, then DMs for high STR or DEX are applied to simulate that skill level, although in situations where different manipulators have different DMs, the Referee should determine whether a DM applies. Note that a robot with DEX 15 manipulators and Athletics 0 would be considered to have Athletics (dexterity) 3 for skill recording purposes but would not receive an additional DM+3 to that skill while attempting checks using Athletics (dexterity).

Manipulator Characteristics

Characteristic	Default Value	Maximum	Characteristic Cost Formula
STR	2 x Manipulator Size - 1	2 x default STR	Manipulator Size x (net increase STR)^2 x Cr100
DEX	TL ÷ 2 +1 (round up)	TL+3	Manipulator Size x (net increase DEX)^2 x Cr200

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VEHICLE ROBOT MANIPULATORS

The *Vehicle Handbook* includes specifications for manipulator installation on vehicles on page 59. Vehicle-installed manipulators are considerably larger than robot-installed manipulators and require additional equipment to control their limbs. Optionally, vehicles of four or less Spaces may install robot-scale manipulators using the *Robot Handbook*. These manipulators are waldo arms controlled by the vehicle operator. For the purposes of vehicle to robot conversion and manipulator specifications and pricing, a four-Space vehicle is equivalent to a Size 8 robot, a 2–3 Space vehicle is equivalent to Size 7 and a 1 Space vehicle to Size 6. Up to four vehicle-installed robot manipulators can be installed using one vehicle Space. A vehicle sized at one Space may install two Size 5 (or smaller) manipulators without using its only Space.

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EXAMPLES

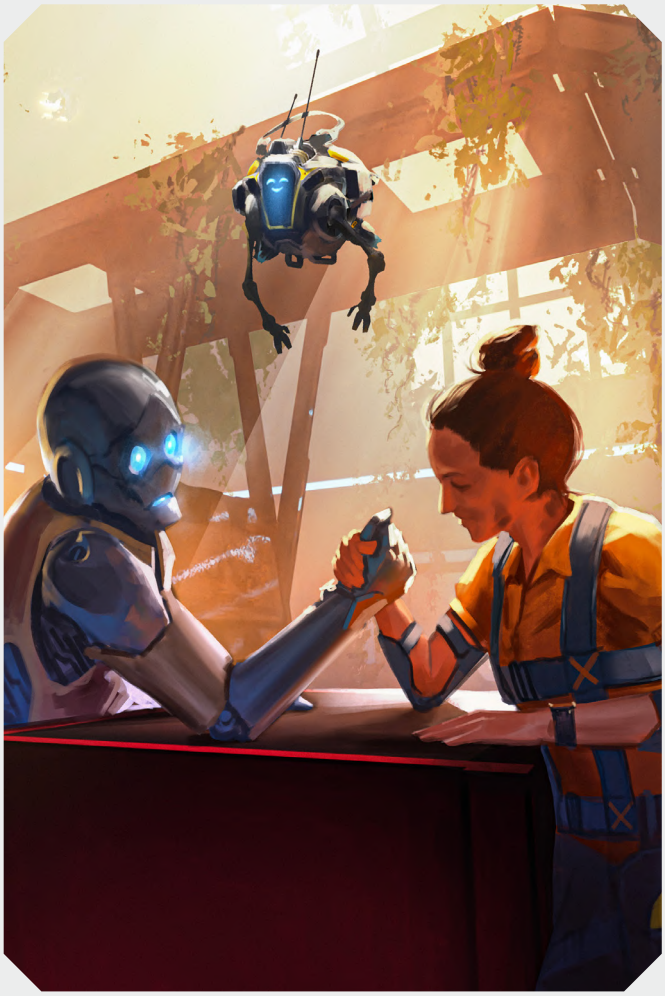
Steward Droid

The Steward Droid has two Size 4 manipulators by default, with STR 7 (2 x Size - 1) and DEX 7 (TL ÷ 2 +1). This is perfectly adequate for a domestic robot and requires no modification.

StarTek

The StarTek robot has two manipulators that need to be upgraded for heavy lifting. At TL14, these manipulators have STR 9 and DEX 8. To allow for heavy lifting, the two Size 5 arms can be increased to Size 6, gaining a default STR 11, but that expends Slots (10% rounded up to require 2 Slots per manipulator), so instead they are enhanced to STR 12, a +3 modification from default costing (Cr100 x 5 Size x 3 x 3) Cr4500 per arm.

For more delicate work, a third manipulator of Size 3 is added with STR 5 and DEX 8. Being two sizes smaller than the base robot, this manipulator requires 2% of the robot's Slots, rounded up to one Slot. To be nimble for this delicate work, this manipulator has DEX +4, giving the manipulator DEX 12. At Size 3 this third manipulator has a base Cost of Cr300 (Cr100 x 3) with the added DEX +4 enhancement at (Cr200 x 3 Size x 4 x 4) Cr 9600 for a total cost of Cr9900. Despite the increased cost, the manipulator does not gain a general Athletics (dexterity) DM even if the robot has an Athletics skill package because the Referee determines that the DEX modifier is limited to the specific actions of the small arm.



STEWARD DROID

Manipulators (including modified legs)

#	Size	STR	DEX	Slots	STR Mod/Final(DM)	DEX Mod/Final(DM)	Skill	Cost
1	4	7	7					
2	4	7	7					

STARTEK

Manipulators (including modified legs)

#	Size	STR	DEX	Slots	STR Mod/Final(DM)	DEX Mod/Final(DM)	Skill	Cost
1	5	9	8	0	+3/12 (+2)	0	Athletics (strength) 2	4500
2	5	9	8	0	+3/12 (+2)	0		4500
3	3	5	8	-1	0	+4/12 (+2)	n/a	9900
+								
+								
+								

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Default Suite

Every robot Size 1 or larger includes a Default Suite of five Zero-Slot options to allow for basic sensory and communication functions. The standard Default Suite available at TL8 and above includes:

- Visual spectrum sensor (380 – 750 nm)
- Voder speaker – voice modulation
- Auditory sensor (20 – 20,000 hertz)
- Wireless data link (50 metres)
- Transceiver 5km (improved)

This allows the robot to have vision, audio input and output, and connections to a local computer network and a city-range radio network. The Default Suite is included in the cost of the base chassis but removal of components does not alter the cost of the robot. Any Zero-Slot item can be installed as a substitute component in the Default Suite.

Other options available at no additional cost when substituted as one of the five Default Suite Zero-slot items are:

- Drone Interface – for remote control, available at TL6
- Transceiver 5km (basic) – available at TL7
- Video Screen (basic) – low resolution LCD, available at TL7

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EXAMPLES

Steward Droid

The standard Default Suite is adequate for the Steward Droid and is included at no cost. It adds no traits or skills to the robot.

StarTek

The StarTek robot requires sensors that span the electromagnetic spectrum. The designer replaces the visual spectrum sensor with a PRIS sensor. This sensor could have been added as a separate Zero-Slot component but as the PRIS sensor includes the visual spectrum, the designer deems it more efficient and aesthetically appealing to replace the default sensor. The PRIS sensor adds Cr2000 to the cost of the Default Suite and provides the StarTek robot with the IR/UV Vision trait.

STEWARD DROID

Default Suite (5 Zero-Slot Items)

Item	Slots	Notes	TL	Traits	Skill	Cost
Visual spectrum sensor	0					
Voder speaker	0					
Audible sensor	0					
Wireless data link	0					
Transceiver, 5km (improved)	0					

STARTEK

Default Suite (5 Zero-Slot Items)

Item	Slots	Notes	TL	Traits	Skill	Cost
Visual spectrum sensor	0	Upgrade	12	IR/UV Vision		2000
Voder speaker	0					
Audible sensor	0					
Wireless data link	0					
Transceiver, 5km (improved)	0					

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Zero-Slot Options

Some options are small enough to require no Slots. These options include items that are applied to the outer surface of a robot or take up negligible internal space and generally have a mass of no more than one kilogram. A robot's surface area and volume are finite, however. In addition to the five Zero-Slot options of the robot's Default Suite, a robot design can incorporate additional Zero-Slot options equal to its size plus its Tech Level. Beyond Default (5) + Size + TL any additional Zero-Slot options require one Slot each. To conserve space for additional options, a robot's design can incorporate any of the Zero-Slot options listed in this section as part of a custom Default Suite.

Additionally, microbots can only have Zero-Slot options. Specific limitations and properties of these tiny robots are described in the Microbots section starting on page 80.

Chassis Surface

In addition to armour, a robot has some options that can be applied as coatings to its surfaces. Zero-Slot option coatings are listed in this section; other surface options are available but require Slot expenditure and are listed in a later section. The cost for all chassis surface options is multiplied by the Base Slots for the robot's chassis Size.

Camouflage: Visual Concealment

Visual camouflage is designed to conceal a robot from visual detection, focusing on the human visual spectrum at lower Tech Levels and expanding into infrared, ultraviolet and beyond as Tech Levels improve. Lower Tech Levels rely on static colours and materials to achieve an effect, rendering camouflage ineffective in inappropriate terrain; camouflage patterned for a pink forest environment will not work on a rocky asteroid. Advanced TL12 camouflage is an adaptive multi-chromatic coating that conforms to all terrains; it can also be used to achieve full-motion 2D video across the robot's hull for styling or advertising purposes. Superior TL13 camouflage uses visilight technology to actively bend light around the robot with fibre-optic emitters, rendering the robot nearly invisible.

Minimum range is the shortest range at which camouflage is effective in its intended environment. This value assumes a robot of Size 5. Smaller robots may benefit from camouflage at shorter ranges at the Referee's discretion, whereas the opposite could be true for larger robots. The Detection DM for camouflage is applied against Recon checks to detect the robot and considered the equivalent of the robot's Stealth skill. A reflec armour renders visual camouflage ineffective.

Camouflage: Visual Concealment

Camouflage	TL	Minimum Range	Detection DM	Notes	Cost per Base Slot
Primitive	1	500	-1	Natural materials	Cr1
Basic	4	250	-2	Painted patterns	Cr4
Improved	7	100	-2	+Infrared and thermal protections	Cr40
Enhanced	11	50	-3	+Full spectrum	Cr100
Advanced	12	10	-4	+Multi-chromatic	Cr500
Superior	13	1	-4	+Visilight	Cr2500

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Camouflage: Audible Concealment

Audible camouflage is designed to conceal a robot from the detection of sound, muffling the noise from its motors, limbs and locomotion. Audible camouflage negates the Heightened Senses trait when applied to detecting the concealed robot but is only applied against Recon checks when the robot is not in line of sight or protected by visilight camouflage. If a robot is capable of both audible and olfactory camouflage, the camouflage DM associated with the primary sense of the detecting party is used against Recon checks.

Camouflage: Olfactory Concealment

Olfactory camouflage is designed to conceal a robot from chemical detection by other machines and beings reliant on smell as a primary sense. Olfactory camouflage negates the Heightened Senses trait when applied to detecting the concealed robot but is only applied against Recon checks performed when the robot is not in line of sight or protected by visilight camouflage. If a robot is capable of both audible and olfactory camouflage, the camouflage DM associated with the primary sense of the detecting party is used against Recon checks.

Hostile Environment Protection

A robot equipped with a hostile environment protection package has an outer shell capable of withstanding hostile environmental conditions, including temperatures between -50° C and +50° C, high and low humidity, up to 500 rads of radiation, most biological attacks and Atmospheres 2–9, A, D and E. Survival in full vacuum or trace atmospheres requires vacuum environment protection but hostile environment protection allows a robot to function in vacuum conditions for twice as long as an unprotected robot.

Item	TL	Cost per Base Slot
Hostile Environment Protection	6	Cr300

Reflec Armour

Reflec armour consists of a shiny plastic coating that provides protection against laser fire. Reflec is not compatible with visual camouflage since it negates the associated stealth bonus and imposes an additional DM-2 on Stealth checks. Reflec armour provides Protection +10 against laser fire in addition to the robot's existing armour.

Item	TL	Cost per Base Slot
Reflec Armour	10	Cr100

Camouflage: Audible Concealment

Camouflage	TL	Minimum Range	Detection DM	Notes	Cost per Base Slot
Basic	5	50	-1	Coverings and dampers	Cr5
Improved	8	10	-2	+Active sound dampening	Cr10
Advanced	10	5	-3	+Active sound projection	Cr50

Camouflage: Olfactory Concealment

Camouflage	TL	Minimum Range	Detection DM	Notes	Cost per Base Slot
Basic	7	100	-1	Chemical coating	Cr10
Improved	9	20	-2	+Active emissions	Cr20
Advanced	12	10	-3	+Active negation	Cr100

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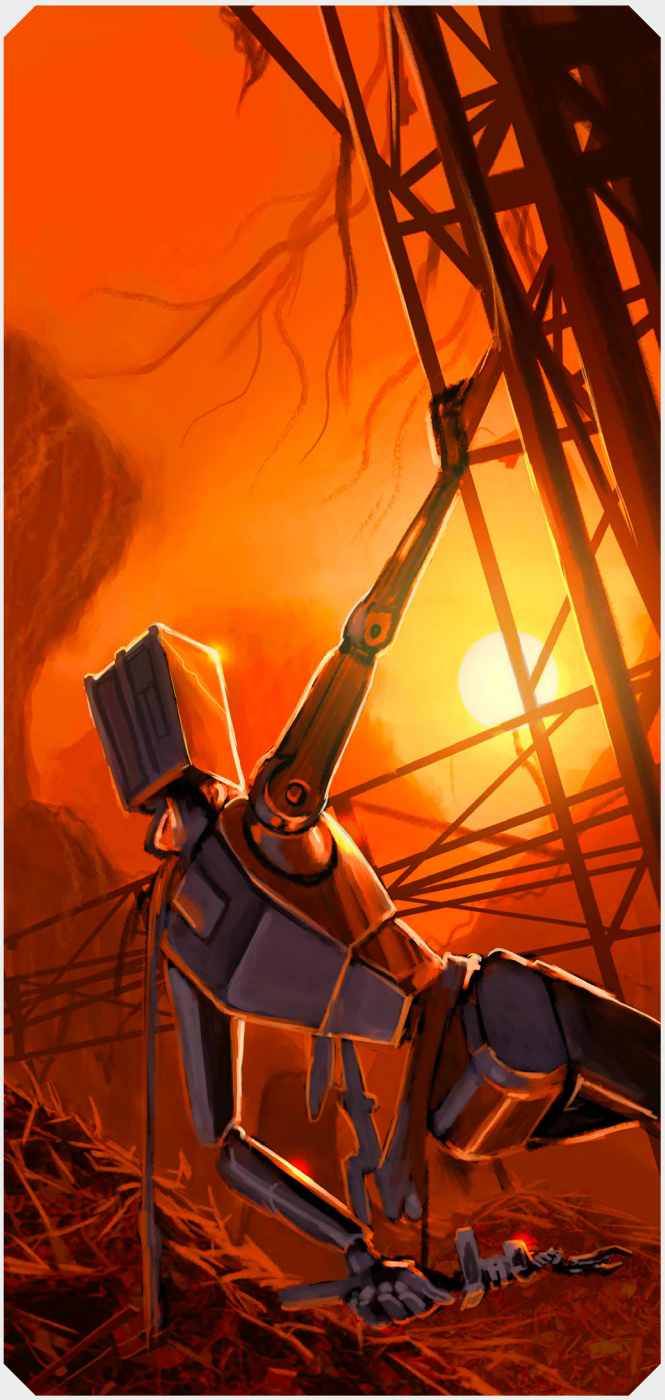
Solar Coating

A solar coating option covers the surface of the robot with photovoltaic cells. It is not compatible with reflec or visual camouflage options. The solar coating allows near unlimited endurance in sunlight, at habitable distances from most stars, but limits the power output of the robot, reducing mobility if not used in conjunction with the standard power supply or power cell included in a robot.

Solar coating power restrictions only apply to robots that have exceeded their endurance period or have no internal power system. These restrictions depend on the robot's mode of locomotion and amount of available sunlight. In low light conditions, such as cloudy or indoor environments, reduce the capabilities of the solar coating to the next less-advanced version. For each orbit beyond the habitable zone of a star, reduce the capabilities by one level. For example, Improved Solar Coating functions at the Basic level when operating one band out from the habitable zone. However, moving closer to a star than the habitable zone does not gain any capabilities and risks the robot overheating.

During periods of sunlight a basic solar coating can fully recharge a power system or power pack in four times the duration of its endurance if the robot is dormant or limited to zero mobility. More advanced solar coatings can recharge power packs at a one-hour-per-hour basis for a dormant robot and at one fourth the rate for a robot performing minimal activities and moving at no more than one-metre speeds.

Maximum Flying and Ground Speeds refer to the maximum movement rate when operating on solar power only, if regular power is not installed or depleted.



Solar Coating	TL	Maximum Flying Speed	Maximum Ground Speed	Cost per Base Slot
Basic	6	None	1m	Cr500
Improved	8	None	2m	Cr100
Enhanced	10	1m	4m	Cr200
Advanced	12	2m	Full	Cr500

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Vacuum Environment Protection

A robot equipped with a vacuum environment protection package has a sealed outer shell and internal components capable of functioning in the hostile environment of outer space. A vacuum protection package includes all of the capabilities of a hostile environment package and expands the operational temperature range to between +250°C and -250°C. A robot equipped with this package can operate in Atmospheres 0-A, D, E and some F environments as well as underwater to a depth of 10 metres in standard atmosphere and gravity. The robot can survive for a number of hours equal to its Tech Level in corrosive (B) environments and its Tech Level in minutes in insidious (C) environments. Vacuum environment protection for biological robots applies to those based on beings that cannot normally survive vacuum or trace environments.

Item	TL	Cost per Base Slot
Vacuum Environment Protection	7	Cr600
Vacuum Environment Protection (biological)	10	Cr50000

ROBOTS IN VACUUM

Robots do not need to breathe but some power systems rely on the presence of atmospheric gas, usually oxygen, to function and many designs assume components can be cooled using convection provided by an atmosphere, not just radiative cooling in vacuum. While a robot not equipped with vacuum environment protection does not cease to function immediately in a vacuum or trace atmosphere, it does operate less optimally.

A robot without vacuum environment protection operating in vacuum or trace atmosphere suffers a 50% decrease in endurance and requires a malfunction check (see Robot Maintenance on page 108) every hour of operation, with DM-2 to the check if the robot is operating in temperatures above 100°C or below -100°C. A robot with hostile environment protection only requires a check every two hours.

Androids suffer no additional ill effects, except those as noted, but biological robots suffer the same effects as their template lifeform in vacuum conditions.

COMMUNICATIONS

A robot can communicate in a variety of ways, from voice to video to radio waves. Many of these can be miniaturised to be usable by even the smallest of robots as Tech Levels improve.

Drone Interface

A drone interface is primarily a receiver for controlling drones but also allows a robot's brain to be bypassed, allowing it to act either as a drone while under remote control, or a robot when operating independently or out of range of a drone controller. A drone interface connects a communications device such as a transceiver to the robot's brain, integrating with locomotion and sensory systems. A robot equipped with a drone interface requires no additional actuators to operate as a drone. A drone interface can be substituted for any component of a robot's Default Suite at no cost.

A drone interface can act as an override switch, allowing an authorised user to take complete control of the robot or shut it down. Regulations in some jurisdictions require the installation of a drone interface on all robots. To command the robot, a biological remote user requires a drone interface, although another robot can control robots or drones more efficiently with a robotic drone controller.

A drone interface also acts as an inhibitor (see page 120) that allows for remote shutdown and geofencing – limiting the operating range – of robots. In most cases a robot allows the drone interface to override its conscious functions or at least gain control of its movements. A recalcitrant robot with an Advanced or more sophisticated brain can 'resist' a drone interface take-over, requiring the controller to actively gain control (see Hacking Robots on page 106). Some robots can shut down a drone interface after detecting a failed attempt to take control. Others can shut down a drone interface at any time, although the ability to 'self-isolate' is usually not an option for drone interfaces installed in jurisdictions that require them.

A drone interface requires a separate transceiver to be installed.

Item	TL	Cost
Drone Interface	6	Cr100

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Encryption Module

A robot may use specialised hardware to encrypt communications prior to transmission. This equipment also encrypts data on the robot itself, including brain and memory functions. Decryption normally requires a Very Difficult (12+) Electronics (comms) or Electronics (computers) check but encryption created at a higher Tech Level is generally impossible to decrypt within a reasonable timeframe. Decrypting an encryption algorithm created at a lower Tech Level provides at least DM+1 for every Tech Level a decryption tool is superior to the technology used to encrypt the information. By TL8 nearly all transmissions are encrypted by default but the encryption module provides a much higher degree of protection against advanced decryption methodologies, which target weakness across the entire communications chain.

Attempts to gain unauthorised access or hack into an encryption module robot require a successful decryption attack prior to the access attempt unless the hacker is in possession of an authorised drone control interface with the robot's authorisation decryption key installed.

Item	TL	Cost
Encryption Module	6	Cr4000

Transceiver

A transceiver is a two-way radio device capable of directly communicating between transceivers or with a local telecommunications network. The transceiver in the standard Default Suite has a range of 5km, although more powerful transceivers can communicate with it at greater ranges. By using a local telecommunications network, the 5km transceiver can reach any other node within that network. On many TL8+ worlds with substantive populations, this includes communications via satellite relay to any other transceiver on the planet.

To reliably communicate directly with a ship in orbit, a transceiver requires a minimum range of 500km. At lower Tech Levels, transceivers are bulky and require slots. Zero-Slot transceivers, their ranges and costs vary with Tech Level.

Transceiver	Range (km)	TL	Cost
Basic	5	7	Cr250
Improved	5	8	Cr100
Improved	50	8	Cr500
Enhanced	50	10	Cr250
Advanced	50	13	Cr100
Improved	500	9	Cr1000
Enhanced	500	11	Cr500
Advanced	500	14	Cr250
Improved	5,000	9	Cr5000
Enhanced	5,000	12	Cr1000
Advanced	5,000	15	Cr500

Video Screen

The video screen is a flat panel for displaying still or moving images built onto the surface of the robot. The cost for this option assumes a small screen but an option to extend it to cover the entirety of the robot is available by multiplying the cost of the screen by the Base Slots of the robot's Size. This full-screen option can be used as an improvised camouflage coating, providing the equivalent of basic visual camouflage compatible with any terrain. A basic video screen can be included as a no cost item in a Default Suite. Video screens do not include a voder speaker but can emit pre-recorded or transmitted sounds.

Video Screen	TL	Screen Resolution	Cost
Basic	7	2D: 640 x 480	Cr200
Improved	8	2D: 1,920 x 1,080	Cr500
Advanced	10	3D: 16K x 9K	Cr2000

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Voder Speaker
A voder is a speech synthesiser for audible communications in a robot's known languages. A voder differs from a standard audio speaker in that it actually generates sound based on the robot's inputs, not playing a pre-recorded or transmitted audio message. The voder can also emit non-speech sounds, including alarms, music or sounds from the natural environment, although a source for these sounds and sophistication of speech is a function of the robot's brain and programming. By TL9 a voder's speaking voice is indistinguishable from natural speech. When not included as part of a Default Suite, a voder costs Cr100.

A broad-spectrum voder speaker can emulate sounds beyond most species' hearing ranges, useful when communicating with aliens who use ultra-low or ultra-high frequency sounds.

Item	TL	Cost
Voder Speaker	8	Cr100
Voder Speaker (broad spectrum)	10	Cr500

Wireless Data Link
A wireless data link provides high-speed secure communications to a local data network such as those within a building or ship. The data link includes an inherent Security/0 package and encryption capable of secure communications protocols of up to the robot's Tech Level. A wireless data link is available at TL8. When not included as part of a Default Suite, a wireless data link costs Cr10.

Wireless data links transmit and receive data at 10 times the rate of a comparable transceiver of the same Tech Level. To transfer new or upgraded skill packages a robot requires either a wireless data link connection or to be connected directly to the issuing data system.

Item	TL	Cost
Wireless Data Link	8	Cr10

MISCELLANEOUS
This section includes a variety of Zero-Slot options not covered by other categories.

Gecko Grippers
Much like its namesake, gecko grippers use the Van der Waals force to enable to robot to adhere to surfaces, including walls and ceilings. A robot equipped with gecko grippers can climb vertical surfaces and adhere to the walls and ceilings of almost any material in gravity environments ranging from 0–1.5 G although movement is halved while traversing these surfaces.

Item	TL	Cost per Base Slot
Gecko Grippers	9	Cr500

Injector Needle
An injector needle is essentially a stinger equipped with a hollow tip, allowing it to deliver fluid into a target. This could be medicinal, poison, acid or any fluidic substance. An injector needle is treated as a stinger, requiring a successful melee attack to use. It inflicts one point of damage and has AP equal to the base armour of the robot of its Tech Level (see page 19). Subsequent effects depend upon the fluid injected into the target. An injector needle contains enough fluid for a single attack but can be used as a stinger in subsequent combat rounds until refilled.

A robot may install multiple needles but each counts as a separate Zero-Slot option; up to four needles may be clustered and used in a single attack. Injector needles are available at TL7 for Cr20 each.

Item	TL	Cost
Injector Needle	7	Cr20

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Laser Designator

A laser designator is a low-powered laser, usually infrared to avoid visual detection, used to identify a target for tracking or for guided munitions to strike. Successfully targeting an object with a laser designator requires an Average (8+) check as a Minor Action. The laser designator is considered the equivalent of a ranged weapon with a 100-metre effective range, with all bonuses for DEX and range applying, but no skill required.

A fire control system linked to a laser designator receives DM+2 to attack a target successfully illuminated. The designation is effective until the end of the subsequent combat round. The designation check must be repeated each round to be successful, but subsequent checks receive DM+4 if designating a stationary target.

Item	TL	Cost
Laser Designator	7	Cr500

Magnetic Grippers

Magnetic grippers enable a robot to adhere to metallic surfaces in gravity environments ranging from 0–1.5G. It can climb metallic walls and walk across metallic ceilings, although movement is halved while traversing these surfaces. Magnetic grippers are not useful on ceramic, plastic or natural material surfaces.

Magnetic grippers allow a robot to voluntarily attract metal objects within one metre of its body or extremities, useful for the retrieval of dropped items or errant tools in zero gravity but this use of grippers is not selective and attracts all metal items in the vicinity.

Item	TL	Cost per Base Slot
Magnetic Grippers	8	Cr10

Parasitic Link

A parasitic link allows a robot to attach itself to another robot and take control of its body. The target robot must have a drone interface or equivalent to be susceptible. A parasitic link is often used by a microbot to 'ride' another robot host but can be installed and used by any robot. The link requires physical contact to operate but is not hindered by a robot's armour, although a hardened brain provides some protection. The parasitic link grants automatic access but not control, which requires a check.

See Hacking Robots on page 109 for further details on the process of taking control of a robot. If successful, the controlling robot may operate its host as if the link was an enhanced robotic drone controller. A link can only control one robot but a robot could theoretically use multiple links to control multiple robots, although contact between each robot and a parasitic link must be maintained at all times.

Item	TL	Cost
Parasitic Link	10	Cr10000

Self-Maintenance Enhancement

This alleviates or eliminates the need for annual maintenance. Use of high-quality components and self-repairing modules allows for extended independent operation but at considerable cost. Robots intended for extended field operations, such as long-range explorers or surveillance robots often include this expensive option.

Self-Maintenance Enhancement	TL	Maintenance Period	Malfunction Check	Cost per Base Slot
Basic	7	12 years	1 year	Cr20000
Improved	8	24 years	2 years	Cr50000

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Stinger
A stinger is a sharp needle or blade, which can be extended from the body of a robot or its manipulators to puncture a target as a melee attack. A stinger only inflicts one point of damage but has AP equal to the base armour of a robot of its Tech Level (see page 19). A robot may install multiple stingers but each counts a separate Zero-Slot option. Up to four stingers may be clustered and used in a single attack.

Item	TL	Cost
Stinger	7	Cr10

SENSORS
Sensors provide a robot with awareness of its environment. Zero-Slot sensors are small enough to be placed on a robot's head, if one exists, even on microbots.

Atmospheric Sensor
An atmospheric sensor determines atmospheric pressure and composition, screens for common containments and determines basic environmental data such as temperature and relative humidity. The sensor is available at TL8 and costs Cr100. An atmospheric sensor is included in the suite of instruments that comprise an environment processor and planetology sensor suite.

Item	TL	Cost
Atmospheric Sensor	8	100

Auditory Sensor
A basic auditory sensor is included in the Default Suite but can be purchased separately for Cr10 starting at TL5. It is normally sensitive to sounds in the hearing range of its designer's race, which for Humaniti is 20-20,000 hertz and is sensitive down to 0 decibels.

More advanced auditory sensors have increased frequency and threshold capabilities and are included in various recon sensors and environment processors.

A stand-alone broad spectrum auditory sensor is available at TL8. This grants the Heightened Senses trait and provides high sensitivity across a broad range of frequencies from 1–200,000 hertz and down to -10 decibels. The broad-spectrum sensor is included in the suite of instruments that comprise an environment processor.

Item	TL	Trait	Cost
Auditory Sensor	5	—	Cr10
Auditory Sensor (broad spectrum)	8	Heightened Senses	Cr200

Environment Processor
The environment processor correlates inputs from highly sensitive sensors with threat analytic algorithms to optimise responses. It grants the Heightened Senses trait, applying DM+1 to all Recon and Survival checks. The environment processor includes an atmospheric sensor, broad-spectrum audio sensor, Geiger counter, advanced light intensifier sensor and provides Recon 0, although this skill is limited to the processor's sensory input and often superseded by a full recon sensor suite or recon skill packages on most reconnaissance-focused robots. The environment processor does not include an olfactory sensor or PRIS sensor but can accept inputs from them.

Item	TL	Trait	Cost
Environment Processor	10	Heightened Senses	Cr10000

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Geiger Counter

A Geiger counter is a sensor that can detect alpha, beta and gamma radiation and determines intensity and likely source. Its functions are included in a PRIS sensor and environment processor.

Item	TL	Cost
Geiger Counter	8	Cr400

Light Intensifier Sensor

This sensor allows clear, monochrome binocular vision up to 18 metres in anything less than total dark. At TL9, the advanced sensor combines light intensification with visual-spectrum and false-colour thermal imaging in the same sensor. The advanced sensor is included in the environment processor.

Light Intensifier Sensor	TL	Trait	Cost
Basic	7	—	Cr500
Advanced	9	IR Vision	Cr1250

Olfactory Sensor

An olfactory sensor provides the robot with the ability to emulate a generalised sense of smell using a suite of chemical detectors. The basic sensor suite provides human-level acuity. The improved sensor suite emulates the acuity of a more olfactory-attuned race such as Vargr and grants the Heightened Senses trait. The advanced sensor provides broad-range trace chemical detection capability beyond any one biological being's capability and also grants the Heightened Senses trait. An olfactory sensor only operates in an atmosphere; the basic and improved sensors operate in Atmospheres 4–9 and in Atmospheres 2–3, D and E at DM-2. The advanced sensor operates equally well in all atmospheres from trace to exotic (1-F) and is included in a planetology sensor suite.

Olfactory Sensor	TL	Trait	Cost
Basic	8	—	Cr1000
Improved	10	Heightened Senses	Cr3500
Advanced	12	Heightened Senses	Cr10000

PRIS Sensor

Either as a supplement or replacement to the visual spectrum sensor provided in the Default Suite, this sensor extends vision into infrared and ultraviolet wavelengths and beyond, and provides passive light amplification. A PRIS sensor grants the IR/UV Vision trait and includes the functionality of a Geiger counter.

Item	TL	Trait	Cost
PRIS Sensor	12	IR/UV Vision	Cr2000

Thermal Sensor

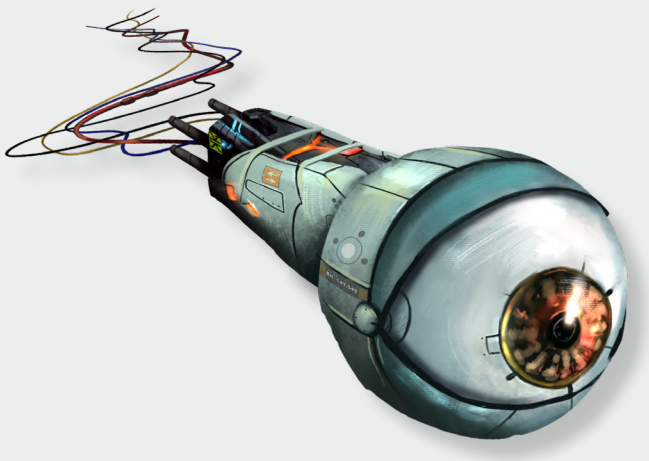
Either as a supplement or replacement to the visual spectrum sensor provided in the Default Suite, this sensor extends vision into the infrared spectrum, granting the IR Vision trait. Its functionality is included in the TL9 version of the light intensifier sensor and the PRIS sensor.

Item	TL	Trait	Cost
Thermal Sensor	6	IR Vision	Cr500

Visual Spectrum Sensor

The visual spectrum sensor is included in the standard Default Suite but can be purchased separately for Cr50.

Item	TL	Cost
Visual Spectrum Sensor	7	Cr50



Conny Delshagen (Order #42562827)

EXAMPLES

Steward Droid

The Steward Droid performs food preparation as part of its duties and the detection of odours is also a useful trait for its cleaning function. An advanced olfactory sensor is included as a Zero-Slot option, costing Cr3500 and granting the Heightened Senses trait. This is the only added Zero-Slot option but the Steward Droid could have up to 15 more Zero-Slot options: Size (4) + TL (12).

StarTek

The StarTek robot is required to work in hostile environments, including vacuum conditions. The vacuum environment protection option includes all hostile environment protection features and costs Cr600 per Base Slot for a total of Cr9600. StarTek could have up to 18 more Zero-Slot options: Size (5) + TL (14).

STEWARD DROID

Physical Options

Item	Slots	Notes	TL	Traits	Skill	Cost
Olfactory sensor (improved)	0		10	Heightened Senses		3500
Autobar (enhanced)	2	Max DM+2	10			2000
Autochef (enhanced)	3	Max DM+2	11			5000
Medikit (basic)	1	Max DM+0	8			1000
Storage compartment (refrigerated)	2	~4 litres				200

STARTEK

Physical Options

Item	Slots	Notes	TL	Traits	Skill	Cost
Vacuum Environment Protection	0	+500 Rads	6			9600
Starship engineering toolkit (advanced)	4	Max DM+3	14			10000
Medikit (enhanced)	1	Max DM+2	12			5000
Radiation environment protection	1	+700 Rads	14			9600
Weapon mount: pistol	1		5			500
(spare)	1	Future use				

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SLOT COST OPTIONS

Items larger than approximately one kilogram in mass or one litre in volume require an expenditure of Slots for installation. As a rule of thumb, a Slot represents no more than three kilograms of mass, although bulky or awkward items may require more Slots than their mass would indicate.

CHASSIS OPTIONS

Slotted chassis options include both surface and interior components. Unlike surface coatings, such as reflec armour or solar coating, chassis options require additional equipment or support structures and use the indicated number of Slots regardless of the Size of the robot. The cost for chassis options is multiplied by the Base Slots of the robot's Size. For some options, the robot can only have one installed option of that type but others can stack. Unless specifically stated, a robot may have multiple types of chassis options installed on its surface.

Active Camouflage

Going beyond the light-bending properties of visilight camouflage, an active camouflage surface uses quantum waveguides to bend light, making the robot practically invisible across the entire electromagnetic spectrum, providing DM-4 to both Recon and Electronics (sensors) checks. Active camouflage grants the robot effective Stealth 4 and the Invisible trait. Only one active camouflage option can be installed on a robot.

Item	TL	Slots	Cost per Base Slot
Active Camouflage	15	1	Cr10000

Corrosive Environment Protection

This robot is modified through the use of ceramics and corrosion-resistant materials to withstand corrosive (B) atmospheres. The corrosive environment protection option includes all the benefits of hostile environment protection but does not provide vacuum environment protection. It does provide complete protection from temperatures ranging from -200°C to +200°C. Only one corrosive environment protection option can be installed on a robot.

Item	TL	Slots	Cost per Base Slot
Corrosive Environment Protection	9	1	Cr600

Insidious Environment Protection

This robot is modified to temporarily withstand the most destructive (insidious) atmospheres by use of advanced seals and corrosion-resistant materials. This customisation does not provide permanent protection but does protect the robot against insidious environments for a number of days equal to the TL of the robot. After this time has elapsed, the robot loses its protection until it is completely refurbished, a process taking 1D days in a fully equipped workshop and an expenditure of 5% of the total cost of the robot. Insidious environment protection includes all the benefits of hostile environment protection but does not provide vacuum or corrosive environment protection. It provides complete protection from temperatures ranging from -270°C to +800°C and from pressures of up to 10 x TL atmospheres. It may also be used for enhanced submersible environment protection (see page 42). Only one insidious environment protection option can be installed on a robot.

Item	TL	Slots	Cost per Base Slot
Insidious Environment Protection	11	1	Cr3000

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Radiation Environment Protection

A robot with this environment protection is hardened to survive a high-radiation environment through shielding and radiation-resistant components. The protection afforded by this feature stacks with the 500 rads provided by hostile environment protection and provides an additional 50 x TL rads protection starting at TL7. Radiation environment protection can be applied multiple times to a robot for additional safety.

Item	TL	Slots	Cost per Base Slot
Radiation Environment Protection	7	1	Cr600

Self-Repairing Chassis

A self-repairing chassis provides the robot's outer shell with a nano material sealant that repairs minor damage and breaches of the robot's chassis. This modification repairs scratches, small dents and punctures, such as those caused by bullets or hand-held laser weapons. It does not repair major damage or missing components and only restores one Hit per penetrating attack, requiring one minute to repair damage from each penetration. Only one self-repairing chassis option can be installed on a robot.

Item	TL	Slots	Cost per Base Slot
Self-Repairing Chassis	11	5%	Cr1000

Submersible Environment Protection

A submersible environment is different from atmospheric or vacuum environments since pressure increases quickly, essentially adding one standard atmosphere for every 10 metres depth in water. Without submersible protection a robot can operate at up to 10 metres depth without adverse impact, although robots with the light chassis modification may experience damage to exposed components at the Referee's discretion. Submersible environment protection does not include the hostile environment option but any robot equipped with the hostile environment protection option or other options that include it should have little difficulty surviving prolonged immersion in 10 metres of non-corrosive fluids.

Robots with submersible environment protection have a Safe Depth. Beyond Safe Depth, a robot must avoid a critical hit on a 2D check of 4+ once per minute. For every multiple of the Safe Depth, the robot suffers a DM-2 to this check.

A robot can use any locomotion type except aeroplane and VTOL while submersed, however all but aquatic locomotion suffer Agility -2 and a reduction in movement speed to half, rounded down. Wheeled, tracked and walker modes require movement across the bottom of a body of water unless aquatic locomotion is installed.

Submersible Environment Protection	TL	Slots	Safe Depth	Cost per Base Slot
Basic	4	5%	50m	Cr200
Improved	6	2%	200m	Cr400
Enhanced	9	2%	600m	Cr800
Advanced	12	2%	2,000m	Cr1000
Superior	15	2%	4,000m	Cr2000

A robot may apply additional submersible environment protection to increase its Safe Depth. Each application of Safe Depth increases the value by the indicated metres and requires an additional indicated percentage of Slots. Once the total percentage of Slots allocated to submersible environment protection is calculated, this value is rounded up to the nearest Slot.

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CLEANING OPTIONS

Robots are often found in domestic and industrial cleaning roles. While some humanoid robots use the same tools as a biological cleaner or custodian, others have built-in equipment, including vacuums, mops, dusters, buffers and sprayers. Consumables, including caustic cleaning agents, are often loaded in separate storage compartments. A robot equipped with cleaning equipment can typically operate for 20 out of 24 hours, spending the remaining time on replenishment, waste disposal and travel between locations. A robot with multiple or different types of cleaning options may only operate one set of cleaning equipment concurrently. Areas to be cleaned are usually expressed in square metres, with a typical starship stateroom equal to approximately 18 square metres.

Domestic Cleaning Equipment

Domestic cleaning equipment is suitable for use in homes, passenger, retail or dining areas and other domestic spaces. The equipment provided to the robot determines how quickly and efficiently a robot can clean a room.

Industrial Cleaning Equipment

Industrial cleaning equipment is suitable for use in areas not considered domestic, such as those with machinery, food preparation equipment, warehouses and hangars. Industrial cleaning equipment includes a larger variety of tools and chemicals.

Domestic Cleaning Equipment	TL	Slots	Square metres per hour	Cost
Small	5	1	10	Cr100
Medium	5	4	50	Cr1000
Large	5	8	120	Cr5000

Industrial Cleaning Equipment	TL	Slots	Square metres per hour	Cost
Small	5	2	10	Cr500
Medium	5	8	50	Cr5000
Large	5	16	120	Cr20000

Conny Delshagen (Order #42562827)

COMMUNICATIONS OPTIONS

While most robot communication options are miniaturised and require no Slots, specialised or lower tech options are large enough to consume considerable space within a robot.

High Fidelity Sound System

A voder or the audio speakers associated with video systems can prove adequate sound output but for a rich audio experience, specialised speakers become necessary. High Tech Levels do not necessarily produce better quality sound but allow for greater miniaturisation and sonic focus. At TL11 an enhanced high fidelity sound system can focus sound well enough to avoid 'bleed-off' of loud performances that might otherwise annoy neighbours or passers-by. A sound system can be used to play pre-recorded or transmitted music or other audio output. At TL8 and above, a robot can use the sound system to output its own 'live' performances using its Art (performer) or Art (instrument) skill.

High Fidelity Sound System	TL	Slots	Cost
Basic	6	4	Cr1500
Improved	8	3	Cr2500
Enhanced	11	3	Cr4000
Advanced	12	2	Cr5000

Robotic Drone Controller

Robots have an advantage over biological controllers in that they can use multi-processors to control separate robots doing separate tasks in a manner unmatched by most 'natural' minds.

For successful control, both controller and drone must have transceivers installed, with the range of controller's transceiver being the limiting factor in control distance. In addition to a robotic drone controller, the controlling robot must have an Electronics (remote ops) skill package installed. More advanced robotic drone controllers can command multiple drones but for each drone beyond the first controlled, the effective Electronic (remote ops) skill of the robot decreases by -1. For instance, an advanced drone controller installed in a robot with an Electronics (remote ops) skill package and skill DMs of 3 could control eight independent drones but at a DM-4 for all of them. For effective, but more limited, control of a large number of remote drones, a swarm controller (see following page) would probably be more effective. The robotic drone controller includes a communications multiplexor with enough channels to support the maximum number of drones and allow similar concurrent wireless data links to program drones or other robots.

Maximum skill indicates the highest level of Electronics (remote ops) a robot can use through the robotic drone controller. This is reduced by the DM for controlling multiple drones.

If desired, a robot could install a less machine-optimised 'biologically-controlled' drone controller. This lacks the multiplexor and limits control to one drone but does not limit the Electronic (remote ops) skill of the operator.

Robotic Drone Controller	TL	Slots	Maximum Drones	Maximum Skill	Cost
Basic	7	2	1	0	Cr2000
Improved	9	1	2	1	Cr10000
Enhanced	10	1	4	2	Cr20000
Advanced	11	1	8	3	Cr50000

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Satellite Uplink

A satellite uplink allows a communication system to maintain a steady link to a ship or satellite in orbit. It requires a transceiver capable of at least 500 kilometres but allows the transceiver to reach a ship or satellite as far as 50,000 kilometres distant. For one-on-one communications, a ship can initiate and maintain communications with a single robot that is not equipped with an uplink but the uplink enables multiple robots to remain in constant communication with a single ship. It also allows the robot to initiate the communication with a ship of known location or orbit.

A satellite uplink amplifies a robot's transceiver up to 100 times when communicating with a ship-sized receiving array. Communications with large communications arrays on space stations or ground installations can be multiplied a million times or more, depending on the diameter of the receiving antenna, allowing a robot to conduct interplanetary communications.

Item	TL	Slots	Cost
Satellite Uplink	6	2	Cr1000

Swarm Controller

A swarm controller allows a robot to control a large number of drones, microbots or nanorobots that have data links, receivers and control components. Swarms cannot be directly controlled by biological beings; in the absence of a robot, a computer or device running Swarm Control software is required.

A swarm controller can manage a theoretically unlimited number of machines, provided they are within wireless data link range and performing related tasks. For successful control, both controller and swarm must have wireless data links, limiting control distance to 50 metres and the controlling robot must have an Electronics (remote ops) skill package installed. More advanced swarm controllers can command a swarm to complete increasingly complex tasks, although maximum complexity of the tasks carried out by a swarm is also limited by the maximum skill complexity capability of the robot controlling the swarm. For instance, only a Self-aware or Conscious robot brain could attempt to command a swarm to perform a Formidable (14+) task.

More sophisticated swarm controllers allow the controlling robot to simultaneously command separate elements of a swarm to perform different tasks, although this decreases the maximum task complexity of the entire swarm by one level and as with a robotic drone controller, imposes DM-1 on all checks for every additional task. A single swarm task is any physical task that could be completed by one check by a single entity.

A Traveller can attempt to control a swarm using a swarm controller console or computer running Swarm Control software as detailed on page 122 and 123.

Swarm Controller	TL	Slots	Maximum Complexity	Maximum Tasks	Maximum Skill	Cost
Basic	8	3	Average (8+)	1	0	Cr10000
Improved	10	2	Difficult (10+)	2	1	Cr20000
Enhanced	12	1	Very Difficult (12+)	3	2	Cr50000
Advanced	14	1	Formidable (14+)	4	3	Cr100000

Conny Delshagen (Order #42562827)

Tightbeam Communicator

A tightbeam communicator uses lasers or masers to provide point-to-point communication between two such devices provided they are in line of sight. A tightbeam communicator has a 5,000-kilometre range and transmissions are nearly impossible to intercept.

When combined with a satellite uplink, range increases to 500,000 kilometre and communications are easy to maintain between moving targets.

Item	TL	Slots	Cost
Tightbeam Communicator	8	1	Cr2000

Transceivers

At lower Tech Levels or at higher power, a radio transceiver is bulky enough to require Slots. Other than size, these transceiver options are identical to their Zero-Slot counterparts.

Transceiver	Range (km)	TL	Slots	Cost
Basic	50	7	1	Cr1000
Basic	500	7	1	Cr2000
Basic	5,000	7	2	Cr10000
Basic	50,000	8	4	Cr20000
Improved	50,000	10	2	Cr10000
Enhanced	50,000	12	1	Cr5000
Advanced	50,000	15	1	Cr2500
Basic	500,000	9	8	Cr50000
Improved	500,000	11	4	Cr25000
Enhanced	500,000	13	2	Cr10000
Advanced	500,000	16	1	Cr5000

MEDICAL OPTIONS

Robots are often used in medical situations acting as everything from combat medics to surgeons to low berths, the latter of which can be considered as immobile robots with limited capabilities.

Medical Chamber

A medical chamber is an advanced enclosed stretcher capable of supporting or transporting a patient in need of medical attention. It can form the basis of an ambulance robot or custom autodoc through the addition of manipulators, medikits and a brain with the proper skill packages.

The medical chamber includes no manipulators but a robot designed around it should include at least one manipulator of Size 3 or greater to allow handling of the patient and medical equipment within the chamber. The chamber has a sealed environment for the patient, which will provide basic protection to low pressure conditions but does not include hostile environment options; these must be added to the chassis of the robot into which the chamber is installed.

A medical chamber adds +1 to the maximum skill level supported by a medikit option but does not directly add a DM to Medic checks. It does not include a medikit but provides access panels to allow operation of medikits, scientific instruments or manipulators inside the sealed environment of the chamber.

Keeping in mind that a robot's Base Slots encompass only half of its physical volume, a medical chamber sized for adult human occupants requires at least 32 Slots. Medical chambers designed for other races might require fewer or more Slots.

The Imperial Starport Authority standard for a low berth specifies a 50-Slot size medical chamber in dimensions that accommodate all but the most morbidly obese human – technically a human up to 2.25 metres tall and massing up to 150 kilograms, with allowance for overcapacity. This standard includes a specification for a standard spacecraft mounting, which corresponds to a Size 7 robot, 2 vehicle Spaces or 0.5 displacement tons. This standard applies to common low berths and autodocs.

Item	TL	Cost per Chamber Slot
Medical Chamber	8	Cr200

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Medical Chamber Options

Medical chambers can include a number of options that allow conversion into cryoberths, low berths or autodocs.

Technologies required for cryoberths and low berth hibernation systems are similar. A cryoberth is designed to quickly (within one combat round) freeze an individual, usually in response to severe medical trauma. This process carries inherent risk and the individual must perform a low berth survival check both on entry and exit from cryoberth-induced hibernation. Medical skills applied to aid these cryoberth survival checks are considered rushed, lowering checks by DM-2 and often forgone as counterproductive if no qualified individual is available to assist.

Low-berth hibernation is a more gradual process, usually medically supervised, which only requires a survival check during the retrieval process. Improved versions of both technologies are available at TL12, providing DM+1 to both freezing and revival checks.

Cryoberths, low berths and autodocs are designed with the physiology of a specific species in mind. While a unit designed for humans works equally well whether the patient is Solomani, Vilani, Zhodani, even Geonee or Suerrat, aliens suffer a negative DM when attempting to use a system designed for Humaniti. For a Vargr or other Terran-evolved being, this is DM-1. For Aslan, K'kree, Hiver or other species with similar biochemistry, this is DM-2. For truly alien races with divergent or unknown biochemistry, the DM is at least -4 and there is a chance the mechanism will be unable to do anything other than kill and preserve the body. The converse applies for humans who use alien-designed systems. Each species-specific add-on option can provide safe hibernation and treatment for one additional specified alien species without incurring a penalty, assuming a broadly similar biochemistry and reaction to environmental factors.

At TL13, a nanorobot applicator allows the medical chamber to program and apply nanorobots to a patient and includes a swarm controller specialised for this use. The applicator can store up to two litres of medical nanorobots and the larger nanorobot generator also includes a one-Slot enhanced fabricator to create medical nanorobots from raw materials in addition to functioning as a nanorobot applicator.

At TL14, a medical chamber is capable of reanimation, provided no more than 2D minutes have passed since the patient's death and the body is generally intact. This period can be doubled by extremely cold conditions, extended up to 1D days by placing the corpse in a low berth or indefinitely if preserved using the cryoberth option – although any cryoberth or low berth survival negative Effect contributes a negative DM to the Difficult (10+) Medic (1D x10 minutes, EDU) task of successful reanimation.

Medical Chamber Option	TL	Slots	Cost
Cryoberth (basic)	10	8	Cr20000
Cryoberth (improved)	12	8	Cr20000
Low berth (basic)	10	8	Cr20000
Low berth (improved)	12	8	Cr20000
Nanorobot applicator	13	4	Cr100000
Nanorobot generator	13	8	Cr200000
Reanimation	14	8	Cr900000
Species-specific add-on	10	4	Cr10000

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Medikit

A medikit provides basic diagnostic and treatment tools for medical emergencies and long-term treatment of a disease or other medical condition. The complexity of the medikit is the limiting factor of a robot's Medic skill using the robot's internal medikit capability, although it does not limit the robot's skill when it has access to specialised medical equipment or the suite of tools available in a medical chamber.

Medikit	TL	Slots	Max Skill	Cost
Basic	8	1	0	Cr1000
Improved	10	1	1	Cr1500
Enhanced	12	1	2	Cr5000
Advanced	14	1	3	Cr10000

The medikit requires one Slot and occasional replenishment of supplies at a cost of Cr500. With light usage, consumables may last five years; in a field hospital or emergency room they may need daily replenishment.

MISCELLANEOUS OPTIONS

Various options provide robots with integral equipment to perform certain tasks. Where specified by the Maximum Skill column, the sophistication of an option is the limiting factor of a robot's skill using the robot's internal capability, although it does not limit the robot's skill when it has access to external specialised tools for the task.

Agricultural Equipment

Robots are often used as agricultural workers in roles from gardeners to harvesters to hydroponic specialists. Much like cleaning equipment, agricultural equipment performance is measured in square metres worked per hour, with a standard spacecraft four-ton area corresponding to 18 square metres. An agricultural robot can operate effectively for up to 20 of 24 hours, with time out for movement, replenishment and other inefficiencies. Very large agricultural robots may be installed with multiple agricultural equipment options in order to cover a greater area.

Agricultural Equipment	TL	Slots	Square metres per hour	Cost
Small	5	1	20	Cr100
Medium	5	4	100	Cr1000
Large	5	16	500	Cr10000

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Autobar

An autobar option includes a selection of beverages and a mixing function allowing for voice-activated or robot-initiated disbursement of drinks. The complexity of the autobar is the limiting factor of a robot's Steward or Profession (bartender) skill when using the robot's internal autobar capability, although it does not limit the robot's skill when it has access to an external wet bar or autobar device. The autobar has a limited internal capacity of two litres, requiring access to a storage compartment (preferably refrigerated) to provide additional drinks.

The autobar requires replenishment of materials at a cost equal to half its initial cost. With light to normal usage in a household or small spacecraft setting, this replenishment is monthly but with higher frequency use, such as in a hotel bar, replenishment may be needed daily.

Autobar	TL	Slots	Maximum Skill	Cost
Basic	8	2	0	Cr500
Improved	9	2	1	Cr1000
Enhanced	10	2	2	Cr2000
Advanced	11	2	3	Cr5000

Autochef

An autochef is a food preparation system that prepares properly cooked meals when provided with ingredients. The autochef includes equipment for all steps of food preparation from cutting and peeling to cooking and presentation. The complexity of the autochef is the limiting factor of a robot's Steward or Profession (chef) skill using the robot's internal autochef capability, although it does not limit the robot's skill when it has access to an external galley or kitchen. The autochef has only limited storage capacity for holding or reheating two meals but can be connected to an internal storage compartment.

The autochef requires three Slots but does not include ingredients, although it is normally stocked with an initial supply of spices and condiments.

Autochef	TL	Slots	Maximum Skill	Cost
Basic	9	3	0	Cr500
Improved	10	3	1	Cr2000
Enhanced	11	3	2	Cr5000
Advanced	12	3	3	Cr10000

Autopilot

Robots capable of movement at vehicle speeds through use of the vehicle speed movement modification benefit from either an autopilot, a Basic (locomotion) brain or an appropriate vehicle operating skill package to perform complicated manoeuvres. The vehicle speed movement modification itself provides a basic autopilot of skill 0. Additional skill levels can be accomplished using a brain skill package but the robot designer may choose to conserve limited and potentially expensive Bandwidth by installing a separate autopilot processor to control vehicle speed performance.

To perform beyond the basic guidance system included for the vehicle speed movement modification, an autopilot option requires one Slot. Autopilot and skill level packages do not stack; the higher of autopilot or vehicle operating skill applies.

Autopilot	TL	Slots	Skill Level	Cost
Improved	7	1	1	Cr7500
Enhanced	9	1	2	Cr10000
Advanced	11	1	3	Cr15000

Conny Delshagen (Order #42562827)

Bioreaction Chamber	TL	Complexity	Cost per Chamber Slot
Basic	6	Microbes	Cr1000
Improved	8	Tissues	Cr2000
Enhanced	10	Complex organisms, x12 growth	Cr5000
Advanced	13	Complex organisms, x50 Accelerated growth	Cr20000

Bioreaction Chamber

A bioreaction chamber, sometimes called a 'bioreactor' or 'vat', supports a biologically active environment. It can be used to grow cultures or organisms or support a growing biological being, including a human foetus or developing clone. Bioreaction chambers are available in varying sizes. An 8-Slot unit supports a human foetus to full term and a 32-Slot unit supports a full human clone to average adult size. A bioreaction chamber is a sealed environment. It does not provide hostile environment or vacuum protection on its own but can be protected by a robot's chassis if it includes those options. Costs per Chamber Slot refer to the cost related to the size of the bioreaction chamber, not the robot.

A TL6 basic bioreaction chamber can support the growth of microbes with a simple nutrient feed mechanism. This provides the basis for growing medicinal organisms, feedstock and biomass fuel sources.

A TL8 improved chamber provides for the growth of tissues. It can grow skin, muscles or artificial meat fit for consumption.

The TL10 enhanced chamber can grow a complete organism, such as carrying a mammal from conception to birth as an artificial womb. The enhanced chamber can grow a fertilised embryo or cloned organism to full term in a normal gestation period or at up to 12 times acceleration with access to little more than power and stored nutrients.

The TL13 advanced chamber can act as a growth accelerator, increasing the growth rate of tissues or complete organisms by a factor of up to 50, greatly increasing the maturation rate of the organism, though perhaps at the expense of long-term viability.

All bioreaction chambers require organic feedstock of at least the equivalent mass of their output. It is possible to insert an organism's genetic source material and chaff from a wheat harvest into an advanced bioreaction chamber and see a fully grown adult clone emerge four to five months later.

Construction Equipment

Robots are often used as construction workers building everything from basic infrastructure to complex machinery. Construction equipment performance is measured in cubic metres worked per hour, with a standard spacecraft one-ton volume corresponding to 14 cubic metres. A construction robot can operate effectively for up to 20 of 24 hours, with time out for movement, replenishment and other inefficiencies. Very large construction robots may be installed with multiple construction equipment options in order to cover a larger volume.

The listed hourly volumes assume simple construction, such as roads or residential buildings, with roads and other surfaces generally considered one metre deep, allowing a simple equivalence of cubic and square metres. Complex construction, such as that required for vehicles and machinery, proceeds more slowly; at best such construction is at 50% the nominal rate, at worst 10%. Construction equipment may also be used to clear rubble or prepare an area for development.

Construction Equipment	TL	Slots	Cubic metres per hour	Cost
Small	5	2	0.2	Cr500
Medium	5	8	1	Cr5000
Large	5	32	5	Cr50000

Conny Delshagen (Order #42562827)

Fabrication Chamber

A fabrication chamber allows a robot to build objects from component ingredients. It is often referred to as a 'fabricator' or 'fab'. A TL8 basic fabricator is a straightforward 3D printer, able to lay down layers of material to form simple mechanical objects. Increasingly complex fabricators can create objects quicker and of increasing complexity, up to and including additional fabrication chambers themselves. A fabrication chamber is a sealed environment. It does not provide hostile environment or vacuum protection on its own but can be protected by a robot's chassis if it includes those options. A fabrication chamber can create a device equal in size to half its Slot size, or approximately 1.5 litres in volume per Slot. Cost is calculated based on the Slot size of the chamber, not the robot.

Fabricators require materials equal to the mass of the object created. These may be everything from simple powders to rare earths or other required materials, depending on the final product. In general, these materials cost 50% of the cost of a similar purchased product, although those composed of purely common materials may have as low as a 10% material cost and those requiring rare elements may cost more to fabricate in small batches than to purchase from a manufacturer able to acquire materials in bulk. Optionally, the Referee can impose a 1D x 10% materials cost for most products and a 2D x 10% materials cost for computers, robots and complicated electronic machinery.

The TL10 improved fabrication chamber can create simple electronic devices. It can create any part of a robot's body but is only capable of creating a Primitive, Basic or Hunter/Killer brain. When creating complete robot bodies, four times the Slot capacity of the robot is required. For instance, a 64-Slot chamber is required to create a 32-Slot object, which translates into a Size 5 robot with 16 Slots available for customisation.

A TL13 enhanced fabrication chamber can create additional fabrication chambers, even complete robots with Advanced brains, although it is limited to brains and brain options one TL lower than the fabrication chamber itself. An enhanced chamber cannot create Self-aware or Conscious robot brains. An enhanced fabrication chamber includes the technology to act as an advanced bioreaction chamber (see previous page). It can print a full organ, limb or similar replacement part, possibly infusing it with cybernetic components, but is unable to directly print a complete living and thinking organism, although it can infuse a biological creation with an artificial nervous system to be programmed as a robot or artificial being.

A TL17 advanced fabrication chamber can print a complete living biological being or cyborg. It can create Very Advanced, Self-aware or Conscious complexity robot brains. A biological brain created in an advanced fabrication chamber is a blank slate. The printing process is not sophisticated enough to duplicate memory patterns but it can embed wafer jacks capable of acting as accelerating learning enhancers. Objects created in an advanced fabrication chamber cannot be of greater Tech Level than the chamber itself.

As a general rule, fabrication chambers can fully manufacture any non-animate item available two TLs or more prior to their own TL. For instance, a Basic fabricator can manufacture TL6 items, including auto pistols and vacuum-tube radios, while an Improved fabrication chamber can manufacture a transistor radio, portable computer or other TL8 electronic device. This progression holds until the debut of the Advanced fabrication chamber, a device capable of turning a society into a post-scarcity civilisation, with any item available on demand, assuming access to the proper raw materials.

Note that design templates for fabricated items are often patented and require licenses to produce, although pirated and open-source versions of many common and some highly questionable items are available. Most commercially sourced fabrication chambers are specifically blocked from creating weapons, currency, copywritten materials or controlled substances, although specific restrictions vary by government and manufacturer.

The Time Requirement listed for each fabrication chamber is a minimum to complete fabrication of an object. Brains, biological or robotic, and their 'neurological' connections quadruple construction time and complex, highly irregularly shaped objects and objects that require high melting temperatures and cooling double fabrication time, meaning a highly complex robot might need a combined eight times the listed time requirement.

Conny Delshagen (Order #42562827)

Fabrication Chamber	TL	Complexity	Time Requirement	Cost per Chamber Slot
Basic	8	Mechanical	2 hours	Cr2000
Improved	10	Simple electronics Primitive, Basic or Hunter/Killer robot brains	2 hours	Cr10000
Enhanced	13	Complex electronics, simple biomechanical Advanced robot brain	1 hour	Cr50000
Advanced	17	Complex biomechanical Any robot brain	1 hour	Cr200000

Forklift

A forklift option allows a robot to carry heavy loads without the intricacies of a manipulator. A forklift does not allow for delicate handling but is useful for moving boxes or pallets of equipment. The maximum load of a forklift is more a case of balance than gravity and is independent of local conditions, unless the gravity exceeds 1.5G, in which case the forklift maximum load should be adjusted to reflect actual gravity. Multiple forklift-equipped robots can work together to lift a load. Maximum load is expressed in spacecraft displacement tons; multiply by four for vehicle Spaces. Actual mass computations are normally not necessary, as volume can also be a limiting factor but a five-ton starship shipping container might mass up to 32 metric tons.

Forklift	TL	Slots	Maximum Load	Cost
Small	5	8	0.5 tons	Cr3000
Medium	5	12	1 tons	Cr5000
Large	5	60	5 tons	Cr20000

Holographic Projector

A holographic project displays a three-dimensional image or motion picture in front of the robot. The hologram is of adequate fidelity, increasing in quality as Tech Levels increase beyond 10. The holographic projector includes a sound system, although the robot may project sound via its voder speakers or high-fidelity sound system.

Item	TL	Slots	Cost
Holographic Projector	10	1	Cr1000

Mining Equipment

Robots are often used as mine workers and excavators. Mining equipment performance is measured in cubic metres worked per hour, with a standard spacecraft displacement ton volume corresponding to 14 cubic metres. A mining robot can operate effectively for up to 20 of 24 hours, with time out for movement, replenishment and other inefficiencies. Very large mining robots may be installed with multiple mining equipment options to cover a larger volume. The listed volumes assume moderately hard rock. Loose soil may improve mining performance, while metallic asteroids or hard rock may degrade performance considerably. Mining equipment can also be used to clear rubble or prepare an area for construction.

When used for asteroid mining, performance must consider the vagaries of microgravity and collection of debris. A large mining equipment option is the equivalent of a mining drone, gathering 1D tons of common ore per day.

Mining Equipment	TL	Slots	Cubic metres per hour	Cost
Small	5	5	0.5	Cr2000
Medium	5	15	2	Cr5000
Large	5	45	8	Cr15000

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Navigation System

A robot may have a navigation system complete with compass, inertial locator, navigation system receivers and integration between these inputs and its standard sensors to allow it to emulate the Navigation skill in hardware rather than expending a skill package and brain Bandwidth. A robot's navigation system can update itself via local data sources and library data if available. The skill level imparted by this option is based on the system's information and not modified by a robot's INT modifier.

Navigation System	TL	Slots	Navigation Skill	Cost
Basic	8	2	1	Cr2000
Improved	10	2	2	Cr10000
Enhanced	12	1	3	Cr25000
Advanced	14	1	4	Cr50000

Self-Destruct System

A self-destruct system can have two purposes: one is to ensure the robot is destroyed, preventing technology or data from falling into the wrong hands; the other achieves that goal incidentally in an attempt to cause as much damage to the local area as possible. These two systems are referred to as defensive and offensive, respectively.

A defensive self-destruct is composed of explosives strategically placed in a robot's brain, power system and other high-value options. It does damage to the robot equal to one third of the robot's Hits, rounded up, in dice – for example 7D for a 20 Hit robot – and also three critical hits of Severity 1D to the robot's brain. All critical hits and possible cascading effects apply and armour does not prevent any damage. This explosion is 'slow' – more of a fast burn – and damage external to the robot is limited. Anyone within three metres of the robot will take damage equal to one half the robot's damage dice, rounded down – for example, 3D in the case of the 20-Hit robot – but factor in the robot's own armour when determining damage. For example, if the robot has armour +6, the damage to bystanders is reduced by six.

An offensive self-destruct option does an equal amount of damage to the robot but the explosion is 'fast' and the robot's armour does not protect anyone. External damage is two-thirds of the robot's Hits in damage dice rounded down – or 13D for a 20 Hit robot – with a Blast trait equal to the robot's Size. A TDX offensive option provides a gravity-focused explosion of damage dice equal to the robot's Hits – in the ongoing example, 20D – with Blast 15. The nuclear option is a fixed-size explosive illegal in any jurisdiction and usually detectable by Geiger counters; it will do 10DD damage with Blast 1,000, vaporise the robot (and much else) and irradiate the environment.

Self-Destruct System	TL	Slots	Effect to Robot	Effect to Others	Cost per Base Slot
Defensive	8	5%	Hits ÷3 D 3 x 1D Severity Brain Critical Hits	Robot damage dice ÷2 – Robot's armour, Blast 3	Cr500
Offensive	6	10%	Hits ÷3 D 3 x 1D Severity Brain Critical Hits	Hits x 2/3 D, Blast = robot Size	Cr1000
TDX	12	10%	Hits ÷3 D 3 x 1D Severity Brain Critical Hits	Hits x D, Blast 15	Cr5000
Nuclear	12	4	Vaporisation	10DD, Blast 1,000, Radiation	Cr500000 (fixed)

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OFFENSIVE SELF-DESTRUCT RESTRICTIONS

In Charted Space, the Third Imperium takes a very dim view towards robots with offensive self-destruct systems. The Shudusham Concords were written explicitly to ban such devices and possession of a robot with an offensive self-destruct system is prohibited by Imperial Law. While certain permits allow such devices, they are difficult to obtain and often scrutinised by Imperial officials. All Starport Authority facilities have screeners tuned to look for hidden explosive devices and despite built-in methods to obscure self-destruct explosives, defeating the typically TL12+ scanners situated at every point of entry or egress from a starport requires the robot to make a Very Difficult (12+) Stealth check.

In any case, the explosives contained within such a robot are banned at Law Level 1. Unauthorised possession of nuclear explosives is liable to result in life imprisonment or worse and even the use of conventional explosives most often results in a long stay on an Imperial prison world for the robot's owner and a short stay in a smelter for the robot.

Even a defensive self-destruct mechanism is viewed with suspicion and requires enough authorisation to make civilian ownership of a robot so equipped problematic.

Self-Maintenance Enhancement

A self-maintenance enhancement alleviates or eliminates the need for annual maintenance. Use of high-quality components, self-repairing modules and nanomachines allows for extended independent operation but at considerable cost. Robots intended for extended field operations, such as long-range explorers or surveillance robots, often include these options. The enhanced version uses active nanomachines to stretch the robot's 'annual maintenance' requirement to every 60 years with 'monthly' malfunction checks every five years thereafter. The advanced version includes a miniaturised fabricator to repair both the components and the repair nanomachines themselves to completely eliminate maintenance requirements.

Stealth

Stealth provides the capability to hide from electronic detectors, both active and passive. This is achieved primarily through passive means, mainly through the use of advanced materials and designs that limit the robot's available internal volume. In addition to the inherent DM indicated, stealth applies a negative DM to Electronics (sensors) checks equal to the difference between the robot's TL and that of the device it is trying to evade. Reflec armour coating renders stealth ineffective except when scanning for concealed internal components. Stealth requires sacrificing a fixed number of Slots but cost is based on the Base Slots of the robot.

SLOT COST OPTIONS

Self-Maintenance Enhancement	TL	Slots	Maintenance Period	Malfunction Check	Cost per Base Slot
Enhanced	13	10%	60 years	5 year	Cr200000
Advanced	15	10%	Indefinite	indefinite	Cr500000

Stealth

Item	TL	Slots	Trait	Cost per Base Slot
Stealth (basic)	7	1	Stealth (+1)	Cr300
Stealth (improved)	9	2	Stealth (+2)	Cr600
Stealth (enhanced)	11	3	Stealth (+3)	Cr900
Stealth (advanced)	13	3	Stealth (+4)	Cr1200

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Storage Compartment

A storage compartment is an internal space within the robot sealed by a door or panel, usually accessible to its manipulators. Each Slot dedicated to storage can hold approximately two kilograms or two litres and costs Cr50. The storage compartment is protected by the robot's armour and environmental enhancements but does not include an airlock.

Hazardous material storage requires special materials and other safeguards and costs Cr500 per Slot. In general, the material to be stored should be specified upon installation of a hazardous material storage compartment. If an airlock is desired, it should be considered as a separate hazardous material storage compartment of a Slot size large enough to accommodate the item that requires it.

Item	TL	Cost per allocated Slot
Storage Compartment	6	Cr50
Refrigerated Storage Compartment	6	Cr100
Hazardous Material Storage Compartment	6	Cr500

Video Projector

A video projector can display still or moving 2D images on an external flat surface. The display includes a sound system of moderate quality, although the robot can also produce sound through its voder or other sound system.

Item	TL	Slots	Cost
Video Projector	7	1	500

POWER OPTIONS

A robot is assumed to have an internal power system, whether batteries, fuel cells or even internal combustion engines. These systems provide the robot's basic endurance, perhaps supplemented by additional power cells.

However, non-standard conditions may allow for, or require, alternate power sources. If confined to operating in a technological setting, a robot could have no internal power system, making it reliant on external power. Conversely, a robot intended for use far beyond civilisation – for example, an exploratory probe – might use solar panels or a radioisotope thermoelectric generator (RTG) for supplementary or primary power, allowing a low level of endurance for years or decades.

Robots relying only on RTG or solar power sources have their movement rate and STR halved (round down), suffer Agility -2 and may not install the vehicle speed movement modification. Such robots never have an Athletics (endurance) skill. Most robots avoid this limitation by installing both a conventional power system to allow normal operations, at least for an intermittent period of time, and rely on the RTG or solar power unit for recharging. If a robot installs two RTG or solar power sources, in any combination, it is not subject to these performance degradations, provided both power sources are operating at full capability; in such cases the robot could support vehicle speed movement modifications.

External Power

Robots without the external power option require a direct connection to a power source, limiting mobility while recharging and have finite endurance. A robot with this option draws power from an external source such as wires or beamed microwaves. This provides the robot with unlimited endurance while within range of the power source and ensures it is charged at full endurance when it moves outside of range.

Item	TL	Slots	Cost per Base Slot
External Power	9	5%	Cr100

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No Internal Power

If a robot has no internal conventional power system, it gains an extra 10% Slots (round up) available for allocation to physical options. These Slots become available at no cost but do not reduce the cost of the robot, as interfaces to power sources need to be installed to prevent the robot from becoming an inert piece of metal and plastic. A robot without a conventional power system may still use power packs to achieve endurance similar to its base endurance. Without an internal power system or power packs, a robot immediately shuts down when power is not available.

Item	TL	Slots	Cost
No Internal Power	6	+10%	—

RTG Long Duration

A radioisotope thermoelectric generator (RTG) relies on the decay of radioactive particles to generate power. An RTG is a very inefficient and expensive option but might be the only option available for a robot designed to operate in the depths of space or hostile environments with limited exposure to sunlight. An RTG can recharge a power pack or internal power system while stationary or performing minimal activity but requires three times a power pack's endurance to fully recharge it.

An RTG power source's endurance is measured in years. Endurance represents the half-life of the radioactive elements in the RTG unit, the amount of time since unit installation a robot will function. Storage in a powered-off state does not extend RTG endurance.

Once the RTG endurance period expires, the robot will continue to function but at lower power, once again halving the robot's movement and STR and suffering an additional Agility -2. The robot then requires twice as long to recharge additional power systems. Once twice the RTG's endurance has elapsed, the robot ceases to function.

RTG units are large, consuming a considerable portion of the robot's Slots for installation, shielding and cooling. Their cost is based on the robot's Base Slots.

Aging or obsolete RTGs can be replaced but at a cost equal to the replaced RTG plus the new power unit. This assumes proper disposal and safety precautions during the process. Shortcuts can reduce this cost but are likely to cause repercussions.

RTG Short Duration

A more compact version of the radioisotope thermoelectric generator (RTG) uses faster decaying isotopes to provide more power in a smaller package, although duration is still long by battery standards.

RTG Long Duration	TL	Slots	Endurance	Cost per Base Slot
Basic	7	20%	25 years	Cr20000
Improved	9	15%	50 years	Cr50000
Advanced	11	10%	100 years	Cr100000

RTG Short Duration	TL	Slots	Endurance	Cost per Slot
Basic	8	15%	3 years	Cr50000
Improved	10	10%	4 years	Cr100000
Advanced	12	5%	5 years	Cr200000

Solar Power Unit

A solar power unit, composed of solar panels, converters and batteries, is dependent upon sunlight to generate power but its converters and batteries allow operation in the dark for half as many hours as it spent in sunlight. If the robot limits its activity to half its solar-powered limits (by halving again its movement and STR and reducing Agility by a further -2 – this is referred to as 'quarter power') it may operate for as many hours as it spent in sunlight and if stationary and performing only limited physical activity, it may continue to function at that low level for twice as many hours as it spent in light. If equipped with additional power packs, in this lowest operational state, during periods of sunlight it can fully recharge a power pack in twice the hours as the power pack supplies. Under quarter power operations, it requires four hours to charge one hour of power pack endurance and under 'normal' solar power operations it will require eight hours. Without multiple power systems or supplemental sources, the solar power unit will never provide full power.

A solar power system is designed to operate in a star's habitable zone. In a star system's cold zone, usually on a planet further out than a habitable-zone world, the solar power unit provides only enough power to support quarter power activity. At the world beyond that, it can only support a stationary robot. Beyond that, in the frozen outer solar system, it cannot function. Adding additional sets of solar power units extends its zone

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Solar Power Unit	TL	Slots	Endurance	Cost per Base Slot
Basic	6	20%	10 years	Cr2000
Improved	8	15%	25 years	Cr5000
Enhanced	10	10%	50 years	Cr10000
Advanced	12	5%	100 years	Cr20000

of operation, as does the addition of the solar coating option but since solar power weakens with the square of distance, an outer system solar-powered robot remains impractical.

Certain atmospheres or local conditions might further limit the effectiveness of solar power. Even a deep valley on an otherwise habitable world might limit solar power activity. Like RTGs, solar power systems have an endurance measured in years, representing degradation of solar panels over time. However, solar panels can be replaced and the endurance period assumes daily operations; a robot stored in a powered-down state or that only uses solar power as an occasional supplement when 'off the grid' can expect considerably longer lifetimes.

Robots with deployed solar power units may still possess a Stealth trait but suffer a DM-2 to any Stealth checks or provide a DM+2 to the opposition's Electronics (sensors) or Recon checks.

Deployed solar power units increase the effective Size of a robot by +1. The panels may not be armoured beyond the base armour of a robot's Tech Level. Unless attacks are specifically targeted against a robot's components, half of all successful attacks against a robot with deployed solar power are considered to hit the solar power unit, which has 10% (round up) the Hits of the robot itself and ceases to function if destroyed.

Quick Charger

Regardless of a robot's endurance, a full recharge for a robot not operating on external power typically requires eight hours plugged into an external power source. For some robots, this is not sufficient for their duties. The quick charger option allows a robot to be fully recharged in one hour from a high amperage power source such as those found in starship engineering spaces or facilities supporting electric vehicles.

Item	TL	Slots	Cost
Quick Charger	8	1	Cr200

SENSOR OPTIONS

Sensors that require internal space for complicated electronics or instruments require Slots. These sensors are not usually subject to the benefits of miniaturisation and cannot be used by microbots or nanorobots. All sensors listed in this section, with the exception of recon sensors, require an Electronics (sensors) skill of at least level 0 to operate and might require appropriate Science or Investigate skills to interpret results.

Bioscanner Sensor

A bioscanner sensor detects organic molecules and tests chemical samples, studying the components of a sample to detect poisons or bacteria, analyse organic matter, search for life signs and classify unfamiliar organisms. Unlike a science toolkit, samples do not need to be collected to perform a scan; instead, samples must be within three metres of the sensor to achieve a successful scan. This TL15 option costs Cr350000 and occupies two Slots but can provide answers to biological questions in a manner of minutes.

Item	TL	Slots	Cost
Bioscanner Sensor	15	2	Cr350000

Densitometer Sensor

A densitometer sensor uses minute variations in a target's gravity to determine its internal composition. A densitometer sensor must be within 100 metres of a target to make an accurate reading.

Item	TL	Slots	Cost
Densitometer Sensor	14	3	Cr20000

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Neural Activity Sensor

A Neural Activity Sensor (NAS) detects neural activity up to 500 metres distant and provides a rough estimation of the intelligence of organisms based on mental activity. The NAS performs tasks in real-time but even at TL15 remains a bulky instrument.

Item	TL	Slots	Cost
Neural Activity Sensor	15	5	Cr35000

Planetology Sensor Suite

A planetology sensor suite is a set of instruments intended to analyse the characteristics of a planetary environment, providing a full workup of atmosphere and surface composition, climatic conditions and rough internal planetary structure. The suite includes functionality of the atmospheric sensor and advanced olfactory sensor options, adds +1 to the maximum skill level supported by a Science (planetology) toolkit and provides DM+1 to any checks conducted in conjunction with data provided by the suite.

Item	TL	Slots	Cost
Planetology Sensor Suite	12	5	Cr25000

Recon Sensor

A recon sensor package actively maps the environment looking for movement or anomalies that require the robot to take action or make a decision. The package emulates the Recon skill and can only be installed once. It is usable against both conventional stealth and electronic defences. It includes visual, auditory, chemical detection and electronic detection components and can be used in lieu of Electronics (sensors) to detect targets of reduced electronic signature. Recon skill levels provided by this sensor are not modified by a robot's INT.

Recon Sensor	TL	Slots	Recon Skill	Cost
Basic	7	2	1	Cr1000
Improved	8	1	1	Cr100
Enhanced	10	1	2	Cr10000
Advanced	12	1	3	Cr20000

TOOL KIT OPTIONS

A robot may have an internally mounted toolkit dedicated to a specific skill or set of tasks. Some tools may be fixed so they function directly from their mountings, others may be detachable for use by a robot's manipulators or by another individual. Where specified by the Maximum Skill column, the complexity of a toolkit is the limiting factor of a robot's skills using the robot's internal toolkit capability, although it does not limit the robot's skill when it has access to external specialised tools.

Cutting Torch

A basic cutting torch uses incandescent gases fed by a receptacle to cut metal but is ineffective on crystaliron and superdense alloys. The improved cutting torch uses a plasma cutter that can cut through nearly all materials, although it can take a long time to breach hull armour. The miniaturised advanced cutting torch is a UV laser torch of similar power. A cutting torch can be improvised as a melee weapon, doing 3D damage with the AP 4 trait. A cutting torch is included as part of the starship engineering toolkit option.

Cutting Torch	TL	Slots	Cost
Basic	5	2	Cr500
Improved	9	2	Cr5000
Advanced	13	1	Cr5000

Electronics Toolkit

An electronics toolkit contains the tools required to install, troubleshoot and repair electronic equipment. It is highly dependent on the Tech Level of both the tools and the equipment being worked on. In general, a toolkit only allows a positive DM to repair attempts if it is at least the same Tech Level as the equipment being repaired.

Electronics Toolkit	TL	Slots	Maximum Skill	Cost
Basic	6	1	0	Cr2000
Improved	8	1	1	Cr4000
Enhanced	10	1	2	Cr6000
Advanced	12	1	3	Cr8000

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Fire Extinguisher

The fire extinguisher is designed to extinguish most types of chemical and electrical fires. If used to assist a Traveller who has been subjected to fire, the extinguisher reduces damage by half during the first round it is used before eliminating all damage in subsequent rounds.

Item	TL	Slots	Cost
Fire Extinguisher	5	1	Cr100

Forensic Toolkit

This specialised analytical toolkit is designed to investigate crime or accident scenes to determine what has occurred. It is used in conjunction with the Investigate skill. With equipment and materials useful in supporting the scientific skills of biology and chemistry, it can often aid in a task chain using one or more Science skills and Investigate to reach a conclusion.

Forensic Toolkit	TL	Slots	Maximum Skill	Cost
Basic	8	5	0	Cr2000
Improved	10	4	1	Cr4000
Enhanced	12	4	2	Cr8000
Advanced	14	3	3	Cr10000

Mechanical Toolkit

A mechanical toolkit includes tools required for mechanical construction and repair. It is limited by the skill of the user, not the sophistication of the tools, and to some extent the Tech Level of the equipment it must repair. If a piece of equipment is more than two Tech Levels more advanced than both toolkit and robot, repair attempts suffer DM-2.

Mechanical Toolkit	TL	Slots	Cost
Basic	4	6	Cr1000
Improved	8	4	Cr2000
Advanced	12	2	Cr4000

Scientific Toolkit

A scientific toolkit contains tools related to a single scientific speciality such as biology, chemistry or robotics. Obviously, an astronomy toolkit does not include a large telescope, nor does a physics toolkit contain a small particle accelerator, but in general a toolkit contains the materials required to perform tasks or interpret data for a robot to successfully complete a scientific skill check, such as microscopes, testing materials and detailed libraries of scientific data. The speciality of the toolkit must be specified at installation. Biology, chemistry and some other toolkits can be used in tasks requiring the Investigate skill or in lieu of a forensic toolkit at the Referee's discretion.

Scientific Toolkit	TL	Slots	Maximum Skill	Cost
Basic	5	4	0	Cr2000
Improved	8	3	1	Cr4000
Enhanced	11	3	2	Cr6000
Advanced	14	3	3	Cr8000

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Starship Engineering Toolkit	TL	Slots	Maximum Skill	Cost
Basic	8	6	0	Cr1000
Improved	10	5	1	Cr2000
Enhanced	12	5	2	Cr4000
Advanced	14	4	3	Cr10000

Starship Engineering Toolkit

This set of equipment provides increasingly complex toolkits for a robot to perform routine engineering maintenance and repairs aboard a spacecraft. These include generalised electronic and gravitic test and repair equipment, mechanic's tools, a small laser, cutting torch, bulkhead patches, iris valve opener, duct tape and a large hammer. A starship engineering toolkit supports starship-related engineering, electronics and mechanical repair tasks at up to the maximum Electronics, Engineer or Mechanic skill indicated.

The toolkit may be used as a generalised electronics or mechanical toolkit but at a potentially lower skill maximum at the Referee's discretion.

Stylist Toolkit

A stylist toolkit contains tools and supplies (product) to allow the robot to cut, style, colour and wash hair, trim, polish and colour nails, apply facials and makeup and perform similar tasks in each species-specific kit. The kit contains both tools and receptacles to hold and dispense product. Additional product can be sourced from an adjacent storage compartment. One Slot or two litres of product is included within the toolkit and is sufficient for 10 full beauty sessions and costs Cr500 to replenish.

For styling appropriate to a higher SOC, the cost of product doubles for every point of SOC past 8 but a positive Effect of a Profession (stylist) check can increase the effective SOC of the product's value by the Effect's value. Only when attempting to exceed SOC 8 with 'inferior' product is a check normally necessary, and an exceptional failure might have consequences Every species has its own stylist toolkit and use on another species inflicts DM-3 or worse on a task to attempt even 'adequate' styling.

Item	TL	Slots	Cost
Stylist Toolkit	6	3	Cr2000

WEAPON OPTIONS

Combat robots may carry standard weapons and use combat skill packages but more often a robot intended for combat operations has built-in weapon and fire control capabilities. These may include integrated weapon mounts and targeting sensors.

Fire Control System

A fire control system provides targeting assistance to weapons that are integrally mounted on a robot. The fire control system is tied to a single or linked set of weapon mounts and provides targeting bonuses to that weapon or linked set. Each weapon or set of linked weapons generally requires its own fire control system. A fire control system includes the Scope trait and requires one Slot. It is usable only for one primary target at a time.

For finalisation purposes, Weapon Skill DM is treated as the weapon skill of the robot with the integrated weapon.

An integrated weapon without a fire control system should allocate a skill package containing at least a level 0 weapons skill to avoid an unskilled DM-3 when using an installed weapon.

Standard weapons held by a robot are primarily governed by the robot's weapon skill and DEX modifier. A dedicated fire control system for a manipulator-held weapon or any fire control system for a weapon mounted in a robot's manipulator provides a bonus to that weapon in addition to the robot's weapon skill, if any, but this bonus does not stack with any DEX modifier for that manipulator; instead, the larger of the DEX or the dedicated fire control system modifier applies.

Fire Control System	TL	Slots	Weapon Skill DM	Cost
Basic	6	1	+1	Cr10000
Improved	8	1	+2	Cr25000
Enhanced	10	1	+3	Cr50000
Advanced	12	1	+4	Cr100000

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Weapon Mount

A weapon mount is integrated into a robot, either as an attachment to a manipulator or a separate weapon servo. A weapon mounted in the robot's torso may use any available Slots. A weapon installed into a weapon mount does not require additional Slots but the weapon mount does not include the cost of the weapon or any ammunition or power pack. The external power packs of weapons do not require additional mounts or Slots.

The Minimum Manipulator Size is the required manipulator size for attaching a weapon mount to a robot's manipulator and being able to use its DEX or STR modifier.

A small weapon mount may hold any melee weapon useable with one hand, any pistol or equivalent single-handed ranged weapon, or an explosive charge or grenade of less than three kilograms. A medium weapon mount may hold any larger weapon usable by Melee or Gun Combat skills or an explosive of up to six kilograms. A heavy mount may hold any weapon usable with Heavy Weapons (portable). A vehicle mount may hold any weapon of mass 250 kilograms or less that requires Heavy Weapons (vehicle). Larger weapon mounts are only available on vehicles designed using the *Vehicle Handbook.*

Each weapon requires a separate mount, however up to four weapons of the same type can have their mounts linked. Linked mounts make only one attack roll and require only one fire control system. If they successfully hit a target, only one damage roll is made for them but they add +1 per damage dice to the total damage dealt to the target for every extra weapon. This bonus has already been factored into the robots described in this book.

Weapon Mount Autoloader

By doubling the number of Slots used, a weapon mount can be equipped with an autoloader and up to 10 additional magazines or power packs. The cost of this is equal to twice that of the additional magazines. Autoloaders increase the Minimum Manipulator Size of the mount by +1.

Weapon Mount	Slots	Minimum Manipulator Size	Cost
Weapon Mount (small)	1	3	Cr500
Weapon Mount (medium)	2	5	Cr1000
Weapon Mount (heavy)	10	7	Cr5000
Weapon Mount (vehicle)	15	—	Cr10000

Item	TL	Slots	Cost
Weapon Mount Autoloader	6	+100% Weapon Mount size	20 x magazine cost

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THE VEHICLE HANDBOOK AND ROBOTS

A designer may include additional options from the *Vehicle Handbook* that require vehicle Spaces within a robot design at a conversion rate of one Space per 64 Slots. For any options listed both in the *Vehicle Handbook* and *Robot Handbook*, the designer should use the option in the latter when applied to a robot design.

Specifically, options from the *Vehicle Handbook* that do not require Spaces must use a *Robot Handbook* equivalent since what is an insignificant amount of volume on a vehicle might be very significant on a robot. *Vehicle Handbook* options that consume a percentage of Spaces must use the *Robot Handbook* equivalent, if available. Percentage calculations should always be rounded up.

ROBOT OPTIONS AND ARMOUR

Many options included in the robot design rules could be applied to armour or vacc suits. In fact, many options listed for robots are included as features or part of the electronics suite for armour and vacc suits described in the *Central Supply Catalogue*. Others are similar features available as Slot options for battle dress.

In general, any option listed in the *Robot Handbook* can be applied to a Traveller's armour, vacc suit or battle dress. For Slot sizing purposes, a human-scale vacc suit and most non-powered armour is considered Size 5. Any suit massing more than 100 kilograms – usually battle dress – is considered Size 6. Non-battle dress suits can use Zero-Slot items up to their TL or TL +5 if no Electronics Suite is included. Optionally, these suits can include up to eight Slotted items at a mass cost of three kilograms per Slot. Battle dress can use a number of Zero-Slot items up to its TL and as many Slotted items as the armour supports.

Most items function on a Traveller's armour as they do on a robot. However, radiation hardening on a robot can focus on critical electronics, while a Traveller's protection must be whole-body. The radiation environment protection option provides only TL x 10 additional rads protection beyond that of the armour if installed but the option may be installed multiple times.

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EXAMPLES

Steward Droid

The Steward Droid normally has access to a wet bar and a galley but for versatility and 'field service' the designer has chosen to install an autobar and autochef within the robot. With the goal of providing Steward 2 skill, both the autobar and the autochef are enhanced versions, costing Cr2000 and Cr5000, respectively. The autobar requires two Slots; the autochef requires three. In addition, to allow the Steward Droid to deal with dietary requirements, food poisoning and other mishaps, the designer has included a basic medikit, costing Cr1000 and requiring one Slot.

With the above options requiring six Slots, the Steward Droid has two remaining Slots. The designer chooses to dedicate these to refrigerated storage at a total Cost of Cr200.

The Steward Droid has no capacity to carry weapons.

STEWARD DROID

Physical Options

Item	Slots	Notes	TL	Traits	Skill	Cost
Olfactory sensor (improved)	0		10	Heightened Senses		3500
Autobar (enhanced)	2	Max DM+2	10			2000
Autochef (enhanced)	3	Max DM+2	11			5000
Medikit (basic)	1	Max DM+0	8			1000
Storage compartment (refrigerated)	2	~4 litres				200

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StarTek

The StarTek robot is designed to repair starships. As such, its most important option is an advanced starship engineering toolkit. At TL14 this can support a skill level of up to 3 in repair tasks, requires four Slots and costs Cr10000. As a secondary function, the robot can provide first aid in damage control situations and is equipped with an enhanced medikit, allowing it to offer up to Medic 2 skill if its programming supports it. Additionally, to operate in dangerous environments, StarTek has radiation environment protection, requiring one Slot and costing (Cr600 per Slot) Cr9600. Adding to the 500 rads of protection provided by vacuum environment protection, this option blocks another 700 rads (50 x 14) for a total of 1,200 rads protection.

Finally, the robot may have to deal with a variety of situations, including a literal rat's nest in the wiring. So, it is equipped with a TL12 stunner attached to a small weapon mount. The mount requires one Slot at Cr500 and the stunner costs an additional Cr1000 plus Cr200 for the power pack. This weapon can be installed in the Size 3 manipulator to take advantage of the small manipulator's DEX DM+2. If a skill package of at least Gun Combat 0 is installed in the robot, it can use this weapon without a fire control system or a DM-3 penalty.

At this point in the design, the StarTek robot has two Slots unallocated. A brain upgrade (noted later) requires one of these Slots but the final available Slot is noted as a spare for buyer customisation and future upgrades.

STARTEK

Physical Options

Item	Slots	Notes	TL	Traits	Skill	Cost
Vacuum Environment Protection	0	+500 Rads	6			9600
Starship engineering toolkit (advanced)	4	Max DM+3	14			10000
Medikit (enhanced)	1	Max DM+2	12			5000
Radiation environment protection	1	+700 Rads	14			9600
Weapon mount: pistol	1		5			500
(spare)	1	Future use				

Weapon	TL	Range	Damage	Magazine	Cost	Traits	Cost
Stunner	12	10	3D	100	200	Stun, Zero-G	1000

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BRAIN

A brain is what makes a robot something more than a mobile machine or drone. It provides purpose to the robot's actions. The distinction between a drone and a robot is a robot's lack of an external operator. A drone may have some autonomous functions but without external input, it cannot devise or revise its tasks. A robot, once instructed to perform an activity, does so autonomously and reacts to changing conditions. A vehicle autopilot is not generally considered a robot, as the ability to perform mobility tasks is considered a base function of a moveable machine and does not allow the vehicle to perform any other tasks besides navigating its environment, a task so innate to a robot that it is considered a trait, not a skill. Robots have skills beyond the ability to traverse their environment.

BRAIN TYPES

Robot brain types range from simple programmable computers to fully sentient beings. In general, as Tech Levels increase, capabilities increase and costs of equivalent brains decrease, often dramatically. Robot brain types begin with simple programmed mobile computers and progress to full consciousness.

Primitive

The robot has one core function hard programmed into its memory. It is not considered intelligent but is a programmed machine with limited ability to deal with contingencies by referring to preprogrammed decision trees and by indicating alarm status or shutting down when experiencing error conditions. It cannot communicate in any meaningful manner beyond preprogrammed messages.

Basic (X)

The robot has limited intelligence and is focused on its core function. This function is generally determined when it is manufactured and cannot be changed or augmented. Very little additional memory for new skills is available. The robot avoids obvious hazards and can only communicate alerts or status related to programmed functions. It ignores inputs outside the criteria for completing its functions and is limited in understanding by its data set. A list of common core Basic functions is featured on page 6.

Hunter/Killer

The robot has a modified Basic intelligence enabling it to distinguish between friend or foe in a configurable manner. Identification can be based on criteria such as species, uniform, passwords or other factors including biometric recognition from a database. It performs a configurable combat action – such as block, detain, disable, kill or an escalating set of actions – against any target that does not conform to its 'friend' parameters or it can be configured to only engage based on specified 'foe' parameters. A Hunter/Killer brain provides a default skill of Recon 0. A specialised form of Hunter/Killer has a built-in tactical engine to allow it to function effectively in battlefield conditions.

Advanced

The robot has general intelligence and can communicate and interact with its environment in a manner that emulates a sentient being. Communication and actions are literal and formulaic with the potential for unexpected or unfamiliar circumstances to cause confusion, inaction or inappropriate action. An Advanced robot can have its skillset increased or changed by adding additional computing capacity during installation or at a later time. Advanced robots can attempt tasks up to Difficult (10+).

Very Advanced

The robot is highly intelligent, capable of logical reasoning and can attempt functions outside its programmed parameters. It is not conscious but appears to be so and considers itself to be conscious without fully understanding the concept. Very Advanced robots can perform at capabilities similar to or superior to biological sentients in a broad variety of skills. A Very Advanced robot can develop interests and hobbies outside its programmed functions. Very Advanced robots can attempt tasks up to Very Difficult (12+).

Self-Aware

The robot is capable of fully independent thought and reason. While not considered a fully conscious sentient being, this is a philosophical distinction that a Self-aware robot can understand and debate. A Self-aware robot can accomplish tasks based on very general parameters or solely interpretation of its

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owner's requirements. Self-Aware robots have innate intelligence greater than most biological beings and can attempt Formidable (14+) tasks.

Conscious

The robot is a fully conscious being in every aspect. It can exceed its parameters and limitations and has the ability to develop true emotions and ambitions that might not conform to the expectations of its biological creators. Conscious brains combine full sentient thought patterns with high-speed computational and analytical circuitry allowing them to exceed the intellectual capacity of non-augmented biological beings.

SIZE LIMITS

A robot brain fits into a robot chassis of a Size equal to or exceeding its initial Computer/X rating at no Slot cost. At each TL after its introduction, a given brain fits into a robot one Size smaller. In all cases, a robot brain can be accommodated by expending one Slot. For instance, a TL13 Very Advanced brain can be included in a Size 4 or larger robot at no Slot cost at TL13. That same brain could be incorporated into a smaller robot, down to Size 1 by using one Slot. At TL14, that same Very Advanced Computer/4-equivalent brain could be accommodated in a Size 3 or larger robot at no Slot cost and in Size 1 or 2 robots at a cost of one Slot, but the TL14 Very Advanced Computer/5-equivalent brain requires one Slot if installed in a robot smaller than Size 5.

BASE INT AND SKILLS

For skills normally modified by INT or EDU, the skill DM of a robot brain is associated with its INT modifier. This is generally incorporated into the listed skill level of a robot, allowing a highly intelligent robot to substitute its general intelligence for a more expensive skill package. For instance, a TL12 Advanced Brain has base INT 8, which provides DM+0 on INT-based skills. If the robot's brain is upgraded to INT 9, it receives DM+1 to all INT-based skills and for simplicity, this +1 is added to the skill level of the robot.

ADVANCED CAPABILITIES

In addition to Bandwidth available for skill packages, robot brains of Advanced or greater capability have the ability to exceed their programming through installed or acquired skills of level 0. For each point of Computer/X inherent (not expanded) Bandwidth, a robot may have X zero-level skills. If these skills are specified as part of the robot's design, they require a cost equivalent to the skill's level 0 package cost; if the skill develops naturally in the course of a robot's experience, they have no monetary cost.

Robot Brains

Programming/ Control	TL	Computer/X	Cost	Base INT	Skills	Base Capability (built-in at no Bandwidth cost, cumulative)
Primitive	7	0	Cr10000	1	-2	Programmable
Primitive	8	0	Cr100	1	-2	Programmable
Basic (X)	8	1	Cr20000	3	-1	Limited language, Security/0
Hunter/Killer	8	1	Cr30000	3	-1	Limited Friend or Foe, Security/1
Basic (X)	10	1	Cr4000	4	-1	Limited language, Security/0
Hunter/Killer	10	1	Cr6000	4	-1	Limited Friend or Foe, Security/1
Advanced	10	2	Cr100000	6	+0	Intelligent Interface, Expert/1, Security/1
Advanced	11	2	Cr50000	7	+0	Intelligent Interface, Expert/1, Security/1
Advanced	12	2	Cr10000	8	+0	Intelligent Interface, Expert/1, Security/1
Very Advanced	12	3	Cr500000	9	+1	Intellect Interface, Expert/2, Security/2
Very Advanced	13	4	Cr500000	10	+1	Intellect Interface, Expert/2, Security/2
Very Advanced	14	5	Cr500000	11	+1	Intellect Interface, Expert/2, Security/2
Self-Aware	15	10	MCr1	12	+2	Near sentient, Expert/3, Security/3
Self-Aware	16	15	MCr1	13	+2	Near sentient, Expert/3, Security/3
Conscious	17	20	MCr5	15	+3	Conscious Intelligence, Security/3
Conscious	18	30	MCr1	15	+3	Conscious Intelligence, Security/3

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RETROTECH

As technology advances, brains with previously cutting-edge technology become less expensive. This capability is already expressed on the Robot Brains chart prior to the advent of Very Advanced brains. Thereafter, capabilities increase dramatically with technology improvements. A brain of Very Advanced or greater capability drops to 50% of its initial Cost for every Tech Level above introduction. As an example, a TL12 Very Advanced Brain costs Cr500000 when introduced but costs only Cr125000 at TL14; however, it only has the capabilities of the TL12 brain.

BRAIN UPGRADES

The brains of all robots have limited Bandwidth. The inherent Bandwidth of a brain type is an absolute limit on the size of any singular skill package – for instance a TL10 Advanced Brain with Bandwidth 2 cannot use any single skill package requiring more than Bandwidth 2 – but a robot design can incorporate one additional storage module as a one Slot option to increase total brain Bandwidth capacity, increasing the robot's potential number of skills or allowing an increase in the robot's INT. This does not change the robot's inherent skill level limitations.

Brain Bandwidth Upgrade

A robot's design can incorporate a single brain Bandwidth upgrade package at an expenditure of one Slot. A robot can use any Bandwidth Upgrade package as long as its brain is of at least the Minimum Base Brain indicated for the package in the table

Minimum Base Brain	TL	Bandwidth	Cost
Basic or Hunter/Killer	8	+1	Cr5000
Advanced	10	+2	Cr5000
Advanced	11	+3	Cr10000
Advanced	12	+4	Cr20000
Very Advanced	12	+6	Cr50000
Very Advanced	12	+8	Cr100000
Self-Aware	15	+10	Cr500000
Self-Aware	15	+15	MCr1
Self-Aware	15	+20	MCr2.5
Self-Aware	15	+25	MCr5
Conscious	17	+30	MCr5
Conscious	17	+40	MCr10
Conscious	18	+50	MCr5

Brain Intellect Upgrade

A robot brain design can use Bandwidth to increase general intelligence at additional cost. Each increase in INT requires a cumulative cost in Bandwidth; for instance, INT +1 requires Bandwidth 1 but INT +2 requires 1+2, or Bandwidth 3 and INT +3 requires 1+2+3 or Bandwidth 6. No brain can be increased beyond INT +3. The cost to increase INT is based on the new INT and is also cumulative and then multiplied by Cr1000.

Increase	Cost
INT+1	(INT+1) x Cr1000
INT+2	(INT+1) x (INT+2) x Cr1000
INT+3	(INT+1) x (INT+2) x (INT+3) x Cr1000
to INT 12+	Cost x 2

As an example, an increase from INT 6 to INT 9 requires Bandwidth 6 and costs (7 x 8 x 9 x Cr1000) Cr504000. Increased INT that brings a brain to INT 12 or greater is doubled in cost, even for any incremental increase below 12. Increases to INT must be permanently configured into a brain at build time and cannot be altered except by replacing the robot brain. The brain intellect upgrade does not require Slot expenditure.

Brain Hardening

A brain can be protected from radiation and ion weapons by use of alternate materials and shielding. A hardened brain, much like a computer, is given the /fib designation and costs 50% more than a comparable brain. To fully protect the brain, any Bandwidth upgrade package must also be hardened at a 50% cost increase.

Item	TL	Effect	Cost
Brain Hardening	8	Protection from ion and radiation weapons	+50% Brain and Bandwidth upgrade

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EXAMPLES

Steward Droid

The Steward Droid is built at TL12 but targeted at the consumer market and does not require a sophisticated brain or upgrades for additional Bandwidth or INT. By default, a TL12 Advanced brain provides the equivalent services of a Computer/2 with regards to complexity and Bandwidth, and costs Cr10000. It has base INT 8 and with a built-in Intelligent Interface, it can interact normally with biological beings, although the limitations of the Advanced brain keep verbal interaction literal and narrowly focused. Note that with built-in Expert/1, it is only capable of performing Difficult and simpler tasks. With no modifications to its brain, the Steward Droid has Bandwidth 2 available for skill packages and can have two additional level-0 skills.

StarTek

As an all-around ship's engineering robot, StarTek is designed to be very intelligent. Starting with a TL14 Very Advanced Brain that provides Bandwidth 5 and INT 11 for Cr500000, it is very capable on its own. To increase INT and provide room for a variety of technical skills, the designer has added a brain bandwidth upgrade of +6, requiring one Slot and costing Cr50000. One point of additional Bandwidth is dedicated to a brain intellect upgrade, increasing the robot's INT to 12 and granting DM+2 on INT-based skills at a cost of Cr24000 (12 x 1000 x 2). This leaves Bandwidth 10 (the original 5, plus 5 from the upgrade) available for skill packages. The StarTek can also have five additional level-0 skill packages.

STEWARD DROID

Robot Brain Type		Slots	TL	Bandwidth	Base INT	Skill DM	Capabilities		Cost
Advanced		0	12	2	8	+0	Intelligent Interface, Expert 1		10000
Bandwidth Upgrade				Adjusted Bandwidth			Zero Bandwidth Skills	2	
Intellect Upgrade				Adjusted INT			Adjusted Bandwidth	2	
Brain Hardening (/fib)	☐			Trait					

STARTEK

Robot Brain Type		Slots	TL	Bandwidth	Base INT	Skill DM	Capabilities		Cost
Advanced		0	14	5	11	+1	Intelligent Interface, Expert/2		500000
Bandwidth Upgrade: +	+6	1	14	Adjusted Bandwidth		11	Zero Bandwidth Skills	5	50000
Intellect Upgrade: +	0		12	Adjusted INT	12	+2	Adjusted Bandwidth	10	24000
Brain Hardening (/fib)	☐			Trait:000					

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SKILL PACKAGES

PRIMITIVE BRAIN PACKAGES

A Primitive brain is a specialised computer optimised for a single task. Primitive brains have no initiative and can only communicate via structured programmed inputs and responses.

Primitive brain packages include a set of skills and are hard-coded, requiring no Bandwidth. Primitive packages are available at TL7.

A Primitive brain only contains one hard-coded package, which is included in the cost of the brain. The package counteracts any potential negative DMs associated with the computer's DEX or INT characteristics. Multiple Primitive brains cannot be installed in a single robot.

Primitive (alert)

The alert package requires sensory input. The package outputs a preconfigured alert based on programmed instructions and input from connected sensors. These sensors include those installed within the robot and others connected by wired or wireless networks to the brain. The alert package includes the Alarm trait.

Primitive (clean)

The clean package requires a physical cleaning option to perform its tasks. The robot cleans a designated area as instructed, avoiding obstacles using both sensory input and learning algorithms. It communicates error conditions via installed communications options. A clean package is much more limited than a Basic (servant) package; it may only use domestic or industrial cleaning options and not benefit from the use of manipulators or outside tools to increase efficiency. It is strictly a machine capable of using built-in equipment to clean a given area.

Primitive (evade)

The evade package is designed to avoid detection through stealth and camouflage. It is useful in surveillance roles but does not have the intelligence to actively seek a target, making it more of a distraction unless equipped with a recon sensor and transceiver to gather and transmit data. The evade package is preprogrammed to respond to stimuli. Its decision tree is static but contains a randomiser to make it appear unpredictable in behaviour.

Primitive (homing)

The homing package will keep the robot focused on a designated target. The package interacts with sensors, manipulators, locomotive and weapons options to home in on a target. If so programmed, it activates a weapons system when the target is acquired using pre-defined algorithms. The homing package lacks the sophistication of a Hunter/Killer or Basic (target) brain and cannot distinguish between friend or foe in any generalised manner or react to changing conditions.

Package	Skills	Cost
Primitive (alert)	Recon 0	—
Primitive (clean)	Profession (domestic cleaner) 2	—
Primitive (evade)	Athletics (dexterity) 1, Stealth 2	—
Primitive (homing)	Weapon 1	—

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Package	Skills	Cost
Basic (labourer)	Profession (labourer) 2	—
Basic (locomotion)	Athletics (dexterity) X, Vehicle (type) X	—
Basic (none)		—
Basic (recon)	Recon 2	—
Basic (security)	Weapon 1 Tactics (military) 1	—
Basic (servant)	Profession (domestic servant or domestic cleaner) 2	—
Basic (service)	Mechanic 0, Steward 0	—
Basic (target)	Explosives 1 or Weapon 1	—

BASIC BRAIN PACKAGES

A Basic brain is not sophisticated but it is very specialised. This allows for a relatively high level of skill in tasks that do not require much initiative or those without much ambiguity. A Basic brain contains hard-coded circuits optimised for the robot's designated primary task. Except for the Basic (none) brain, a Basic brain's programming and default skill are not variable once installed. A change of default skill requires a full brain replacement.

Basic brain packages include a set of skills and use Bandwidth 1. Basic packages are available at TL8. The skills provided by a Basic package are not subject to INT limitations – specifically, the negative DMs – of the Basic brain.

Weapon skills are normally provided by targeting options but a Basic (security) package may have additional skills such as Melee related to intelligent discretionary use of weapons.

Basic (labourer)

The Basic (labourer) package allows a robot to perform functions such as agriculture, simple construction or mining in conjunction with built-in tools or tools operated by the robot's manipulators. In most instances a check is not needed for a day's labour but if the Referee finds it necessary or interesting, the robot's daily labour can involve an Average (8+) check. Add or subtract 10% per Effect to the robot's output. An exceptional failure results in some sort of mishap.

A Basic (labourer) robot shows very little initiative and performs duties according to a plan provided by a supervisor. Problem solving and creativity are not evident in this robot's behaviour and obstacles are met with brute force or a work stoppage followed by a request for additional guidance. Complex construction or fabrication projects require a robot with at least an Advanced brain and skill packages such as Mechanic, Engineer or a speciality profession.

A labourer package is designed around a set of tasks within a specific function. The robot has the limited role of an order taker with no innovative, planning or questioning behaviour. While a robot cannot operate beyond its function, it is usually broadly defined within that function. For instance, a construction robot is not limited to drywalling or roofing but to the totality of construction tasks required to build a house. However, its interpretation of the assignment is literal – if instructed to build a room without doors or without a floor it does so, exactly to specifications, without question. Likewise, an agricultural robot might be able to pick fruit from a tree or plough a field, and even identify rotten fruit, but would be just as adept at picking poison fruit or planting nice rows of noxious weeds, if so instructed.

Basic (locomotion)

The Basic (locomotion) package is designed for robots whose major function is to travel from one location to another. This package is usually installed on robots with a vehicle speed movement

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modification and functions similarly to an autopilot, providing the robot with a skill in its vehicle class operation equivalent to its agility enhancement modification value. If the robot has no Agility enhancement rating, it has skill 0 in the appropriate vehicle operation. The Basic (locomotion) package and an agility enhancement value also provides the robot with Athletics (dexterity) skill equal to its agility enhancement for the purposes of hazardous manoeuvring and reactions such as dodging. Most robots with a Basic (locomotion) brain have at least a minimal agility enhancement modification installed.

Basic (none)

A robot may have a general purpose basic program installed with no particular skills. This robot responds to general commands with the sophistication of a Basic robot and can be customised later, adding a Basic package with the insertion of a skill chip for a cost of Cr1000. Most robots are not sold without a specialised chip but export restrictions or other considerations might preclude the initial installation of security or target packages.

A Basic (none) robot might instead be installed with a single standard brain package at up to skill level 1. These skill packages are subject to the limitations of the Basic brain's INT, which will generally reduce the effective skill level of the robot to 0, although DEX-based skills might retain higher values. A Basic (none) robot can benefit from a Bandwidth 1 upgrade package to allow use of a second skill package at up to skill level 1 but core brain limitations preclude the use of Bandwidth 2 or greater packages.

Basic (recon)

An upgrade to the Primitive (alert) package, the Basic (recon) package turns the robot into a keen observer. While this package provides the Recon skill, the package does not include any sensors, limiting the robot's capabilities to what it can detect.

The recon package makes the robot pay attention to its surroundings. Some implementations have been criticised as making the robot 'too nosy' but in general the robot learns or is instructed about what to ignore over time. Everything else is noted, recorded and acted upon based on additional instructions.

Basic (security)

The Basic (security) package is concerned with the protection of a facility, asset or person. A Basic (security) robot lacks the aggressive behaviour and target discerning capability of a Hunter/Killer robot and instead focuses on defence of its designated asset. The security robot follows operator-designated escalation procedures and alarms, warns, detains or attacks based on simple criteria. Friend or foe recognition is generally limited to a password or electronic signal. The Basic (security) package includes the Alarm trait.

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The security robot's tactical skill is focused on optimising a firing position and using available cover. It sets only simple ambushes and behaves in a predictable manner that an expert tactician can soon anticipate. The security robot does not think 'two steps ahead' but picks the best available tactical option. A security robot does not pursue its quarry beyond specified parameters. It is also impossible to reason with a Basic (security) robot; its instructions are concrete and not subject to interpretation.

Security robots have an override or standdown code. In some jurisdictions local law enforcement are privy to the override code. Some less sophisticated operators of security robots might leave default codes in place but are liable to only make such a mistake once.

Basic (servant)

The Basic (servant) package is concerned with cleaning and less sophisticated household maintenance. A servant robot can use all cleaning equipment, including that designed for industrial use, but cannot repair damaged goods or equipment, just discarding it and noting the change in inventory to allow for replacement. A servant robot is not adept at making meals but can present them, clean up after them and make sure materials for meals are properly stored, reordered and disposed.

When operating in a purely domestic mode, a servant robot can provide a clean, comfortable environment for up to four Travellers. It cannot act as a steward in a starship environment, nor can it fix broken equipment, although it can handle clean-ups if equipment malfunctions.

Basic (service)

A Basic (service) package is concerned with direct service to the public or simple maintenance tasks. A service robot can prepare a simple meal, ensure basic household maintenance has occurred and note any deficiencies beyond its capability to address. The service robot has good interactive skills and listens intently, although this does not guarantee full comprehension. It takes assignments literally, performing tasks as programmed or requested without thought to unintended effects.

The service robot can operate domestic and industrial cleaning equipment but only in a superficial manner. It can prepare meals and beverages using an autochef or autobar but only uses standard recipes. A service robot can only repair items if it is aware of the device's specific purpose and known failure states; without a service manual it can do nothing. A service robot does not qualify a starship to carry High passengers but it is adequate to support up to eight Middle passengers or 100 Basic passengers, however poorly.

Basic (target)

This specialised package turns the robot into a smart bomb. The target package allows a robot to home in on a single specified target and self-destruct. An improvement on the Primitive (homing) package, it provides the sophistication to change behaviour if the target moves or mission parameters put the target out of bounds, such as a targeted individual running into a school or hospital. In such cases, it might hide and wait for the target to emerge and reengage. The target package is designed for proximity operations and is not as sophisticated as a Hunter/Killer package.

The target brain package includes Explosives 1 and Recon 0, although many designers improve inherent capabilities with a more sophisticated recon sensor option. A robot with melee or ranged weapons may substitute an appropriate skill for Explosives 1 but retains Explosives 0 if designed to self-destruct.

HUNTER/KILLER BRAIN PACKAGES

A Hunter/Killer brain package is combat-focused and includes both friend or foe identification and Recon 0. Higher level weapon skills are provided by fire control systems options or DEX modifiers.

Hunter/Killer (standard)

A Hunter/Killer robot is much more aggressive than a Basic (security) robot. Where a security robot is concerned with the defence of an asset, a Hunter/Killer can be given objectives for attack as well as defence, carrying out an independent attack on a designated enemy. Given a Hunter/Killer robot's focus on offensive rather than defensive action, it has a much more refined friend or foe recognition system. While an operator can still open parameters to a setting as broad as 'kill all but X', in general detailed parameters for determining legitimate targets helps limit legal sanction against the operator for indiscriminate or reckless mayhem.

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Package	Skills	Cost
Hunter/Killer (standard)	Gun Combat/Melee 0, Recon 0	—
Hunter/Killer (tactical)	Gun Combat/Melee 0, Recon 0, Tactics (military) 2	Cr10000

Hunter/Killer (tactical)

The tactical variant of the Hunter/Killer brain package includes a specialised tactical analysis instruction set, allowing the robot to not only develop a sound tactical plan but also anticipate counter actions and adapt to changing conditions. While this package does not provide general intelligence, it makes the Hunter/Killer (tactical) robot the equivalent of an idiot savant in combat tactics and a much more dangerous and less predictable foe. This tactical skill is not subject to the INT limitations of the robot's brain.

STANDARD BRAIN PACKAGES

Standard brain packages are used by brains of at least Advanced sophistication. These packages emulate skilled tasks performed by biological beings. The Standard Skill Packages table is based on a level of 0. The Tech Level requirements for a skill vary with level, with each additional level requiring one TL higher.

Most level 0 skills require no Bandwidth but complex skills, especially those requiring interaction with other beings, may require Bandwidth 1 even at level 0. Each additional skill level requires an additional Bandwidth 1. A brain can hold as many Bandwidth 0 level 0 skills as its base brain Bandwidth score; beyond this, additional Bandwidth 0 skills require Bandwidth 1.

Cost increases by a factor of 10 per skill level; for example, a skill costing Cr100 at level 0 is available at level 1 for Cr1000 and level 2 for Cr10000. No robot skill packages may exceed level 3 and robot brains cannot process skills that require more than a brain's inherent (not expanded) Bandwidth. Characteristic DMs for INT or DEX apply to all these skill packages and may increase a robot's effective skill level beyond 3.

Vehicle skills such as Drive, Flyer, Pilot and Seafarer assume a robot is piloting a vehicle or equipped with a vehicle speed movement modification; movement at Idle speed requires no skill. Robots employing inherent locomotion functions or vehicles with robot brains often use an autopilot to accomplish this function, not a brain package. Most combat rolls are performed using fire control systems; specific combat skills generally only apply to weapons held by a robot, not installed within it.

Recon and Stealth skills are available as standard skill packages but these skills are most often implemented in hardware, through specialised sensors and camouflage or stealth coatings.

The Jack-of-all-Trades skill is never available to any robot.

INHERENT SKILL DMS

The characteristic associated with a skill can provide an additional DM to checks. For simplicity, this DM is included in the final skill determination of the robot as listed in the skills row of its description. While some skills typically related to SOC or EDU are listed as associated with INT, the robot's effective SOC or EDU is considered equivalent to its INT but only in the very narrow sense of performing the specified task. Only Self-aware and Conscious robots have true SOC and EDU characteristics.

Finally, for skills with many specialities, the Referee may rule that selecting a given skill package four times at a certain level provides a broad enough exposure so that the skill can be in all specialities. Optionally, extremely broad skills such as Science may require eight packages for full coverage.

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Standard Skill Packages

Skill	TL	Bandwidth	Characteristic	Cost
Admin	8	0	INT	Cr100
Advocate	10	0	INT	Cr500
Animals	9	0	DEX	Cr200
Art	10	0	INT	Cr500
Astrogation	12	1	INT	Cr500
Athletics	8	0	variable	Cr100
Broker	10	0	INT	Cr200
Carouse	11	1	INT	Cr500
Deception	13	1	INT	Cr1000
Diplomat	10	1	INT	Cr500
Drive	8	0	DEX	Cr100
Electronics	8	0	INT	Cr100
Engineer	9	0	INT	Cr200
Explosives	8	0	INT	Cr100
Flyer	8	0	DEX	Cr100
Gambler	10	0	INT	Cr500
Gun Combat	8	0	DEX	Cr100
Gunner	8	0	DEX	Cr100
Heavy Weapons	8	0	DEX	Cr100
Investigate	11	1	INT	Cr500
Language	9	0	INT	Cr200
Leadership	13	1	INT	Cr1000
Mechanic	8	0	INT	Cr100
Medic	9	0	INT	Cr200
Melee	8	0	DEX	Cr100
Navigation	8	0	INT	Cr100
Persuade	11	1	INT	Cr500
Pilot	8	0	DEX	Cr100
Profession	9	0	INT	Cr200
Recon	10	0	INT	Cr500
Science	9	0	INT	Cr200
Seafarer	8	0	DEX	Cr100
Stealth	10	0	DEX	Cr500
Steward	8	0	INT	Cr100
Streetwise	13	1	INT	Cr1000
Survival	10	0	INT	Cr200
Tactics	8	0	INT	Cr100

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EXAMPLES

Steward Droid

The Steward Droid is designed to be a steward, so its entire Bandwidth is used to provide Steward 2, which costs Cr10000 and requires TL11 as a minimum. With the Advanced brain having base Bandwidth 2, the designer can designate two level 0 skills or hold them in reserve for future development. In this case, the designer chooses to provide Medic 0 for Cr200 to allow use of the robot's built-in medikit and Flyer 0 for Cr100 to allow the robot to act as a pilot for a flying vehicle.

StarTek

To do its job, StarTek requires Mechanic and a broad range of Engineer and Electronic skills. Its INT 12 provides DM+2 to all these skills, allowing a package of skill level 1 to emulate skill level 3 in the execution of its duties. Engineer and Electronics each have four specialities, accounting for Bandwidth 8 to gain all specialities. Mechanic adds one more, using nine of the available Bandwidth 10. With an advanced starship engineering toolkit, the robot can perform all these tasks at a equivalent skill level 3 and with built-in Expert/2, it is capable of performing Very Difficult tasks.

Holding one Bandwidth in reserve for a customer-specific skill package, StarTek can also use up to five Bandwidth 0 skill packages as part of its inherent capabilities. The designer specifies four of these: Athletics, which allows use of the DM+2 for increased STR in the robot's two upgraded manipulators; Medic, which with the INT modifier and enhanced medikit can be performed at an equivalent level 2; Explosives, also subject to the INT modifier and envisioned to handle explosive ordnance disposal functions; and Gun Combat, to allow use of the Stunner without DM-3 as the robot lacks a fire control system and with the DM+2 of the small manipulator, giving it an effective Gun Combat (energy) 2. These skills leave one available Bandwidth 0 skill. Very Advanced robots are complex beings that can develop their own hobbies and interests. To accommodate this, the designer has left this package unassigned.

STEWARD DROID

Skill Package	Level	TL	Bandwidth	Characteristic/Trait	Adjusted Skills	Cost
Steward	2	11	2		Steward 2	10000
Medic	0	10	0		Medic 0	200
Flyer	0	9	0		Flyer 0	100
					Total Cost	39800

STARTEK

Skill Package	Level	TL	Bandwidth	Characteristic/Trait	Adjusted Skills	Cost
Electronics (comms)	1	10	1	INT	Electronics (comms) 3	1000
Electronics (computers)	1	10	1	INT	Electronics (computers) 3	1000
Electronics (remote ops)	1	10	1	INT	Electronics (remote ops) 3	1000
Electronics (sensors)	1	10	1	INT	Electronics (sensors) 3	1000
Engineer (m-drive)	1	10	1	INT	Engineering (m-drive) 3	2000
Engineer (j-drive)	1	10	1	INT	Engineering (j-drive) 3	2000
Engineer (life support)	1	10	1	INT	Engineering (life support) 3	2000
Engineer (power)	1	10	1	INT	Engineering (m-drive) 3	2000
Mechanic	1	10	1	INT	Mechanic 3	1000
Athletics	0	9	0	STR	Athletics (strength) 2	100
Medic	0	10	0	INT	Medic 2	200
Explosives	0	9	0	INT	Explosives 2	100
Gun Combat	0	9	0	DEX	Gun Combat 2	100
(spare bandwidth)			1			
(spare zero bandwidth = 1)						
					Total Cost	697100

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FINALISATION

With the robot design complete, its information can be compiled into a robot record sheet. The first section in this is descriptive, providing the robot's name and a description of function, general appearance and specific modifications, options and components.

COST MODIFICATION

Optionally, the designer may modify the robot's final cost at this time. Any robot's cost can be rounded down or up to one or two significant digits and discounts or premiums can be applied for mass production or societal acceptance or abhorrence of robots.

Standard discounts for common robot models range from 10–20% but are applied unevenly. Combat-oriented robots may be unavailable at any price and rarely sell at discount unless purchased in large quantities. In universes where a particular robot model is ubiquitous and produced by the billions, cost may be reduced by as much as 80%.

ROBOT RECORD SHEET

Robots are categorised in a standardised manner based on capabilities, skills and traits. These entries are derived from information recorded in the robot design form.

In the first blank row directly under **Robot**, record the robot's name, its Hits, mode(s) of locomotion, tactical speed, Tech Level and final cost. If the robot has the vehicle speed modification, record the speed as '–' if it lacks locomotion, or as 'Xm' with X representing speed in metres.

In the **Skills** row, list the robot's skill equivalents in alphabetical order, including any modifiers for INT or other factors incorporated, ignoring duplicates. If a skill with specialities has a base level of 0 increased by the robot's INT or other characteristic to 1 or more, list the specialisation relevant to the robot's operation or list (all).

Attacks refers to the weapons installed on the robot. List weapons and associated traits. While a robot can use its manipulators as weapons it does not normally do so unless it has a Melee skill package. The damage of manipulators may vary but should be informed by the size of the robot or its manipulators. Consider manipulator size ÷ 2 as a good rule of thumb for damage dice. If a robot has no weapons or Melee skill, treat its attacks as 'none'.

The **Manipulators** row should detail the quantity of manipulators and their STR and DEX. These may vary between manipulators. Also note if a walker has its legs modified to be manipulators and their characteristics.

The **Endurance** row should include the robot's final endurance value and any alteration from the vehicle speed movement modification. Endurance is normally indicated in hours but power options such as RTGs or solar are expressed in half-life years, with hourly endurance from other sources listed in parentheses.

The **Traits** row lists the robot's traits from all sources, such as Armour, Locomotion, Size and Options, in alphabetical order.

The **Programming** row records the robot's brain type and INT. Optionally, it may include special features or Bandwidth enhancements.

Finally, the **Options** row contains all installed options, Zero-Slot and Slotted, and any other information that needs to be recorded, such as spare Slots available.

Robot	Hits	Locomotion	Speed	TL	Cost
Skills					
Attacks					
Manipulators					
Endurance					
Traits					
Programming					
Options					

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EXAMPLES

Steward Droid

A description of the Steward Droid should highlight its function as a ship's steward or household butler, provide a basic description of the robot's physical form and list its options and their functions.

The Steward Droid's final cost is Cr39800. Given that this is a common design with a broad market and competitive products available, it is likely to be sold at a discounted price. First, rounding down to two significant digits gives a cost of Cr39000. Then, applying a 10% discount for quantity gives a cost of Cr35100. Rounding this value down to two significant digits results in Cr35000 as a final list cost. Availability may vary this considerably and used models, with their quirks, might be available for considerably less.

Skills, Traits and Options – basically all installed options and any special characteristics – are determined from the robot's design worksheet and listed in alphabetical order in the proper row.

Name:	STEWARD DROID
Description:	Replacing a qualified starship steward or an all-around household butler, the Steward Droid is a humanoid robot designed to interact with people and food. The Steward Droid is a relatively short and thin robot with long arms designed to reach high shelves or to scoop items off the ground. With a built-in autobar and autochef and an advanced olfactory sensor, the Steward Droid is adept at preparing meals and ensuring the comfort of passengers and guests. With an integral medical kit and basic first aid and dietary knowledge, the Steward Droid can treat minor ailments, recommend dietary changes and act as a basic medical aide in emergency situations. Programmed with basic traffic regulations and flying vehicle operational guidelines, the robot can act as an adequate chauffer, although this is often for show, as it is usually inferior to a vehicle's autopilot functions. The Steward Droid's internal refrigerated storage compartment has a capacity of two Slots beyond its inherent autobar and autochef capacity.

Robot	Hits	Locomotion	Speed	TL	Cost
Steward Droid	10	Walker	6m	12	Cr35000
Skills	Flyer 0, Medic 0, Steward 2				
Attacks	none				
Manipulators	2 X (STR 7 DEX 7),				
Endurance	97 hours				
Traits	Armour (+4), ATV, Heightened Senses, Small (-1)				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Autobar (enhanced), Autochef (enhanced), Medikit (basic), Olfactory Sensor (improved), Storage Compartment (2 Slots refrigerated), Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

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StarTek

A description of the StarTek should emphasise its expert functions and possibly its origin story as a ported Aslan-inspired design.

Skills, Traits and Options – basically all installed options and special characteristics – are determined from the robot's design worksheet and listed in alphabetical order in the proper row.

StarTek's final cost is Cr697100. It is a speciality robot so could sell at a premium. Rather than applying a discount, its cost can simply be rounded down to Cr690000. At TL14 and limited to the spacecraft or space station engineering market, a StarTek could be difficult to obtain, perhaps requiring a waiting period or a premium to secure a model.

Name:	STARTEK
Description:	Loosely based on the Aslan Hikare' technician robot, the StarTek is designed to be an all-around replacement for a ship's engineer. The humanoid robot is equipped with a grav propulsion system allowing it to access ship components not easily reachable by human technicians. A third arm can perform delicate electronics work. Skilled in all aspects of engineering, electronics and mechanics and fully equipped with the tools of the trade, the StarTek can also act as a disaster relief robot with a built-in enhanced medikit and skills to perform explosive ordnance disposal. An armour coating, plus vacuum and radiation protection allows StarTek to operate in hostile environments. As a defensive mechanism, the StarTek has a stunner built into its small arm to discourage or disable living obstacles to completing its tasks.

Robot	Hits	Locomotion	Speed	TL	Cost
StarTek	20	Grav Walker	6m	14	Cr690000
Skills	Athletics (strength) 2, Electronics (all) 3, Engineer (all) 3, Explosives 2, Gun Combat (energy) 2, Mechanic 3, Medic 2, +1 available Bandwidth				
Attacks	Stunner (3D Stun, Zero-G)				
Manipulators	2 X (STR 12 DEX 8), 1 X (STR 5 DEX 12)				
Endurance	72 hours				
Traits	Armour (+10), ATV, Flyer (idle), IR/UV Vision				
Programming	Very Advanced (INT 12)				
Options	Auditory Sensor, Medikit (enhanced), PRIS Sensor, Radiation Environment Protection (+700 rads), Starship Engineer Toolkit (advanced), Transceiver 5km (improved), Vacuum Environment Protection, Voder Speaker, Weapon Mount (small), Wireless Data Link, Spare Slot x1				

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SPECIAL ROBOTS AND OTHER SYNTHETICS

In addition to traditional robots, other mobile machines – artificial entities or synthetics – from drones to nanorobots to androids are available for sale. Many of these (usually) thinking, moving machines can be designed using variations of the design procedures for robots presented in the earlier sections of this book. This chapter covers everything from mundane drones to high technology creations beyond the capabilities of most civilisations.

DRONES

A drone is a robot-like machine without a robot brain that is operated remotely. Robots may also be considered drones when operated remotely via a drone interface. Drones are controlled, either by biological beings or robots equipped with a robotic drone controller (see page 44). Other than often having little or no brain installed, drones follow standard robot design procedures.

DRONE INTERFACE

If a robot has a drone interface chip installed, its robot brain can be overridden and operated as a drone with either a biologically operated drone control interface or a robotic drone controller. All that is required is a control unit, communications – usually a transceiver or wireless controller – installed and proper authorisation codes to override the robot's control of its own body.

If communications between the remote operator and the drone fails, the drone may resume either a preprogrammed or fully automatic set of actions. Some drone interface chips mandate a shutdown if communications are disrupted.

Drone Control Interface	TL	Slots	Control DM	Cost
Primitive	5	2	-4	Cr1000
Basic	7	1	-2	Cr2000
Improved	9	0	0	Cr500
Advanced	11	0	+1	Cr4000

DRONE CONTROL INTERFACE

Biological beings operating drones with no robot brain installed require a drone control interface unit, identical to that described on page 67 of the *Vehicle Handbook*. Limited to controlling only one drone, they are not generally installed on robots but can take the place of a more capable robotic drone controller if desired. The Control DM is the modifier applied to Electronics (remote ops) checks made to control the drone through the interface. Drone interfaces installed on robot-sized drones do not require a separate actuation system as is needed in larger vehicle-sized drones but they do require a transceiver or wireless link to communicate with and establish control of drones.

In lieu of a drone control interface, a TL8+ computer may act as a basic drone control interface to control a drone through a transceiver link. More advanced computers running Drone Control software (see page 123) have better capabilities.

VEHICLE DRONES

Vehicle-sized drones do not require a drone interface but in addition to a transceiver, the vehicle requires an actuation system as described on pages 67–68 of the *Vehicle Handbook*. The actuation system requires one Space for every 20 Spaces of the vehicle (but none for vehicles smaller than 20 Spaces) and costs Cr1000 per Space of the system.

MICROBOTS

Most robots are large devices on par with a typical sophont or large animal but certain classes of robots such as surveillance units benefit from small size. A microbot is generally insect-sized and the smallest class of robot used as a single unit, although swarms of microbots also have their uses. As Tech Levels increase microbots become more sophisticated and have the option to become smaller, although extreme miniaturisation tends to offset cost savings from decreased use of materials.

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Microbot Size

TL	TL	Mass (mg)	Minimum Length (mm)
(maximum)	—	30,000	40
8	8	1000	12
9	9	500	10
10	10	250	8
11	11	125	6
12	12	60	5
13	13	30	4
14	14	15	3
15	15	8	2.5
16	16	4	2
17	17	2	1.5

SIZE

A microbot is a Size 0 robot. By convention, a microbot is any robot that has a mass of less than 30 grams, with robots between this size and one kilogram living in a grey area between Size 0 and 1, depending on whether they can support a Slotted option. Minimum mass is limited by Tech Level. Available at TL8, a microbot's Base Cost does not decrease from Cr50 with miniaturisation but the minimum mass continues to decrease as Tech Levels increase. Minimum microbot mass is one gram at TL8 and decreases by about a factor of two for every subsequent TL. All microbots have Hits 1 and the Small (-4) trait. Microbots cannot have armour.

The Microbot Size table provides a rough minimum 'length' limit in millimetres (mm) for a microbot at varying TLs. This minimum is based on a spherical design of moderate density. The microbot's actual dimensions can vary at the discretion of the designer or Referee. Any microrobot may be up to 30 grams maximum size at any subsequent TL but is subject to the same restrictions as a smaller microbot of the same TL.

OPTIONAL CONSIDERATIONS

Microbots are destroyed by any blow that does damage but can be notoriously hard to hit. Even close combat is subject to the Small trait DM-4. At the Referees discretion, attacking these very tiny machines might require an additional DM-2, especially with ranged weapons. If the robot is stationary, however, dropping a heavy object on the machine could solve the problem.

LOCOMOTION

A microbot can use any locomotion. Movement rate is halved (rounded up) but can be increased up to 12 metres per Minor Action by paying 50% of the cost of the locomotion mode (in effect, locomotion mode multiplier x Cr25 x tactical speed increase) for each increase in metres per round.

As with a regular robot, each increase in tactical speed reduces endurance by 10%. The efficiency modification is available but the microbot cannot install additional power cells to increase endurance. The locomotion mode of 'none' is an available configuration but does not grant any Slots. Neither vehicle movement nor secondary locomotion modifications are available.

MANIPULATORS

A default microbot has no manipulators. Size 0 manipulators are available as Zero-Slot options but count against the total number of Zero-Slot options available to a microbot. A microbot manipulator is treated as having STR 0 and the DEX of a full-sized manipulator (TL ÷ 2 +1). The utility of these tiny manipulators is left to the imagination of the designer. Microbot manipulators cost Cr10 each.

ZERO-SLOT OPTIONS

A microbot does not have a Default Suite but can have as many Zero-Slot options as its Tech Level. For the purposes of options such as coatings whose cost is determined by Base Slots, the microbot is considered to have 0.5 Base Slots.

MICROBOT-ONLY OPTIONS

Besides Size 0 manipulators, microbots have certain Zero-Slot options not available to standard robots, including environmental protection and self-destruct options.

Environmental chassis options that normally require Slots are available for microbots but they are expensive, multiplying the total cost of all microbot components except software packages. This cost multiplier is cumulative if multiple environmental options are chosen, including if radiation environment

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Microbot Environmental Multiplier

Option	TL	Cost Multiplier
Corrosive Environment Protection	9	X 2
Insidious Environment Protection	11	X 5
Radiation Environment Protection	7	X 2

protection is chosen multiple times. The environmental options have the same effects and limitations detailed in their standard descriptions.

Microbots have both defensive and offensive self-destruct options. A defensive self-destruct causes 1D damage to the microbot, at least destroying it, usually beyond any hope of salvage. An offensive self-destruct option is only effective with microbots massing more than one gram and does 1D damage only to a target in direct contact with the microbot. With a successful melee attack a microbot might be able to penetrate some types of armour through gaps or exposed surfaces prior to detonation.

MICROBOT BRAIN

A microbot's brain is heavily miniaturised. Following robot brain sizing limitations, a microbot cannot install a brain until it becomes small enough to fit in a Size 0 chassis without a Slot, for example, a Very Advanced TL12 brain has Bandwidth 3 and could not be installed in a microbot until three TLs later, or TL15; this brain would still cost a full MCr0.5. Most microbots have Primitive or Basic brains installed or are designed as drones with no brain. The Microbot Brains table lists these brains.

A microbot has no Slots available for Bandwidth upgrades but may sacrifice Bandwidth for INT increases.

Microbot Brains

Brain	TL	Bandwidth	INT	Cost
Primitive	8	0	1	Cr100
Basic (x)	11	1	4	Cr4000
Hunter/Killer	11	1	4	Cr6000
Advanced	12	2	6	Cr10000
Very Advanced	15	3	9	Cr500000

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MICROBOT DESIGN WORKSHEET

Robot Name:

Characteristic	Value	Slots	Effect		Traits	TL =		Cost
Chassis Size	0	0	Hits =	1		Basic Cost:		
Locomotion Type			Agility =			Multiplier: X		

Chassis Modifications								Skill	
Armour	Base =				Total =				
Efficiency		☐			Endurance =		Hours		
Light Chassis		N/A			Hits: –	1	Total Hits =		

Locomotion Modifications						
Agility +		Final Agility =				
Tactical Speed ±		Final Speed =		Final Endurance =		Hours

Zero-Slot Suite (5 Zero-Slot Items)

TL	Item	Notes	TL	Traits	Skill	Cost
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						

Robot Brain Type	Slots	TL	Bandwidth	Base INT	Skill DM	Capabilities	Cost

Bandwidth Upgrade: +				Adjusted Bandwidth =		Zero Bandwidth Skills =	
Intellect Upgrade: +				Adjusted INT =		Adjusted Bandwidth =	
Brain Hardening (/fib)				Trait:			

Skill Package	Level	TL	Bandwidth	Characteristic/Trait	Adjusted Skills	Cost
					Total Cost:	

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SWARM CONTROL

A swarm controller operated by a robot or Swarm Control software operated by a person allows control of multiple microbots in accordance with the capabilities and limitations described on page 122.

NANOROBOTS

Nanorobots, also called 'nanobots' or just 'nanos' are very small robots. Despite their name, most nanorobots are micron-scale. As most microbots are millimetre-scale robots, this optimistic classification is nothing new and some nanorobots are less than one micrometre, or 1,000 nanometres, in at least one dimension.

Unlike microbots, most nanorobots are too small to be seen without magnification; unlike microbots, nanorobots are not just tiny versions of fully functional robots. Their minuscule size precludes advanced programming, leaving nanorobots as single-purpose programmed devices, usually operating in groups ranging from less than a dozen to millions of machines in a swarm. Nanorobots do not have endurance in the common sense, recharging themselves from their surrounding environment, but suffer degradation that eventually renders them ineffective.

Early examples of nanorobots are more scientific curiosities than practical machines. Mass-produced nanorobots become feasible at TL13 and are constructed in specialised manufacturing facilities or enhanced fabrication chambers. Nanorobot functions centre around three main purposes; medical applications, such as healing or enhancement, construction or destruction of macroscopic objects and environmental alteration or clean-up duties.

In most jurisdictions (generally Law Level 2+), nanorobots are considered controlled substances, requiring licensing and adherence to strict regulations to produce or sell. During the operative period of the Shudusham Concords, nanorobots did not exist outside experimental laboratories. Nevertheless, the 23rd Amendment specifically restricted deployment of lethal and self-replicating nanorobots. The former remains mostly apocryphal, the latter far beyond current technology.

Nanorobots are not sold individually but in packages, usually a 0.1 litre or 0.1 kilogram container filled with millions of nanorobots designed for a single purpose.

As a general rule, a single nanorobot package can perform one medical function, increase one attribute or transform one type of material, although packages as large as one litre are often marketed to solve a particular problem using a mix of nanorobots.

Nanorobots are considered to have vacuum and hostile environment options as standard. Additional environmental protections multiply the cost of the nanorobot using the Microbot Environmental Multiplier table on page 81.

Medical Nanorobots

Medical-grade nanorobots cost Cr20000 per package or double (Cr40000) if intended to cross the blood-brain barrier to affect Intellect. Aging control nanorobots cost quadruple (Cr80000) as much per dose. Medical nanorobots are normally infused into a body intravenously within a fluid, although some may be ingested.

The following rules apply to medical nanorobots:

- A smarm controller is required to initially program medical nanorobots but once injected or ingested, medical nanorobots operate autonomously, although a swarm controller could be used to deactivate them prior to their effective end-of-life.
- A body can only absorb so many medical nanorobot packages at once. After a maximum of 15 active packages or 1.5 litres of active nanorobots, each additional package causes the recipient's END to decrease by -1. This is permanent.
- At TL13, medical nanorobots lose effectiveness after one year and dissolve harmlessly inside the body. Nanorobot durability doubles with every TL, so TL15 nanorobots continue to function for up to four years if not disrupted or destroyed.
- A single package can provide the effects of common drugs such as panaceas for the duration of the nanorobots' effectiveness. Negative effects of multiple or prolonged use of certain drugs are manifest in nanorobot packages just as in normal medications. No PSI-drug packages are known to exist, although a null package is rumoured to be in development.
- A single package can induce regeneration of one characteristic point lost permanently due to injury within one week, allowing regrowth of limbs, eyes and all critical organs but the brain. No more than four such packages can be in effect at any time and the recipient requires at least normal nutritional levels to facilitate regeneration.
- A single package can increase one characteristic by +1. Maximum characteristic increase is +3 but an increase of +2 requires three packages (1 + 2) and an increase of +3 requires six packages (1 + 2 +3).

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Aging can be slowed by medical nanorobots, reducing aging rate by 50% at TL13, 75% at TL14 and 90% at TL15. Unlike anagathics, ceasing nanorobot treatment will not cause an adverse reaction but after 20 years of use, medical nanorobots begin to lose effectiveness, becoming one TL less effective at reducing aging.

This loss of effectiveness is cumulative but does not change a nano's period of effectiveness. For example, a Traveller receiving nanorobot aging treatment at TL15 must pay Cr80000 every four years for a new package. Over the course of 60 years, the Traveller must receive a new package every four years. The Traveller ages two years in the first 20 years, five years in the next 20 and 10 years in the final 20, for a total aging of 17 years and a total cost of MCr1.2. At TL13, a Traveller pays MCr1.6 over the course of 20 years and ages 10 years during that period. When starting with TL13 nanos, further treatment would not be effective unless continued with TL14 nanorobots but the Traveller would already be considered to have undergone 20 years of treatment and the TL14 nanorobots would be no more effective than the TL13 – although they would last twice as long, thus reducing the cost of the next 20 years.

In many jurisdictions, age reduction nanorobots are highly controlled and often illegal, although a considerable black market exists. A Traveller may only use one aging reduction package at a time.

Medical Nanos	TL	Cost per package
Pharmaceutical	13	Cr20000
Physical enhancement	13	Cr20000
Mental enhancement	13	Cr40000
Aging rate reduction	13	Cr80000

Construction Nanorobots

Nanorobots intended for construction allow for 'open fabrication' or the additive construction of objects outside the confines of a fabrication chamber. Fabrication nanorobots available at TL13 can only build simple structures, the equivalent of a basic fabrication chamber. Construction nanorobots require some form of swarm controller and may operate within a limited effective range of 50 metres if two-way communication is required. One swarm controller can control as many 0.1 litre 'bags' of construction nanos as its Max Tasks value.

Nano constructors can build larger structures over time. Cost is indicated in Slots of structure produced per hour, which is the maximum capability of a 0.1-litre bag of construction nanos. This translates into 1/64 of a vehicle Space or 1/256 of a displacement ton; four displacement tons can be considered 1,000 Slots for simplicity.

As with fabrication chambers, material cost is 1D x 10% the cost of the final product had it been purchased instead of constructed. A simple structure built from local materials costs nothing for materials but requires twice the construction time per Slot to account for both harvesting and construction using those materials. More efficiently, environmental excavation nanos (see below) can create a mining tunnel or chambers inside an asteroid progressing at the standard hourly rate while a set of construction nanos could use the slag from the excavation process to build surface structures, also at the standard hourly rate.

Basic construction nanos can build simple structures such as the shell of a building and a plumbing system. Improved construction nanos can build a complete facility, including power, environment and lighting but not computer controls. Enhanced or advanced nano constructors are not available until at least TL18.

Construction nanos degrade relatively quickly over time while actively working. They have an effective working life of three weeks or approximately 500 hours. Much like medical nanos, at each Tech Level past their introductory level, this lifespan doubles. Construction nanos can operate for 24 hours a day during their entire lifespan.

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Construction Nanos	TL	Complexity	Cost per Slot created per hour
Basic	13	Mechanical	Cr10000
Improved	15	Simple electronics	Cr50000

ENVIRONMENTAL NANOROBOTS

Nanorobots can transform environments much like microbes but in a more controlled manner. Environmental nanorobots are tailored for specific tasks ranging from simple excavation to soil creation to environmental clean-up. More advanced nanos can jumpstart environmental transformation but their lack of ability to reproduce makes them ineffective in large terraforming projects, although they have a niche use in transforming smaller environments such a sealed cave or lava tube.

Environmental nanos require some form of a swarm controller and may operate within a limited effective range of 50 metres if two-way communication is required.

The base rate of excavation nano progress assumes silicate rock. Softer surfaces are transformed at twice the base rate while harder material, such as metal or industrial rubble, is transformed at half the base rate. The output of excavation nanos is dust, which must be disposed of in some manner, but could be seed material for construction nanos.

Soil creation nanos transform rock into soil, preparing sterile environments for agriculture or further transformation by microbes or other organisms. The soil is the 'waste' produced by these nanos and requires no disposal. Soil creation nanos can also be used to slowly 'disintegrate' structures, although they are unable to break down crystaliron, diamond or superdense materials.

Environmental clean-up nanos must be tailored for a specific containment. The specific output of these nanos depends on the type of containment and may range from useful by-products to solid waste requiring further disposal. Procuring a nano for a particular type of contaminant may be difficult and for particularly toxic or radioactive by-products these nanos might require special licensing and handling. Costs are a range, with the most common contaminants in a region costing the least to clean-up. Unique nanos developed for novel contaminants could cost up to Cr100000 per package.

Environmental nanos often act as catalysts, using local materials to facilitate clean-up. The process of breaking down materials takes a toll on all types of environmental nanos, reducing their working lifespan to one week (168 hours) of use. The lifespan of environmental nanos doubles with each Tech Level after introduction. Environmental nanos can operate for 24 hours a day for their entire lifespan.

Environmental Nanos	TL	Cost per Slot cleaned per hour
Excavation	13	Cr5000
Soil Creation	13	Cr10000
Environmental Clean-up	13	Cr10000–50000

Nanorobot Development

Specific nanorobots can be designed by an individual with the Science (robotics) skill and appropriate equipment, such as an enhanced fabrication chamber and a computer running Fab Creator software (see page 123). Creation of a custom nanorobot swarm requires a task chain beginning with a skill appropriate to the type of nanorobot being developed, such as Medic, Science (biology), Science (chemistry) or Profession (architect) and ending with Science (robotics). Successful completion requires a Formidable (14+) Science (robotics) check (1D weeks, INT) and an expenditure of raw materials equal to 1D x the cost of a completed package of a similar type. In many jurisdictions a license as a registered nanoroboticist is also required if the creator intendeds to sell the resulting product. In nearly as many jurisdictions, creating nanorobots without a license is a criminal offense.

Nanorobot Countermeasures

Stories of nanos run amok, dissolving bodies or turning environments into 'Grey Goo' are mostly fiction. The ability to replicate nanos requires the technology to create a fabricator capable of creating more nanos. This sophistication is not available until at least TL18, beyond the capabilities of Charted Space. Ironically, larger robots with fabrication chambers could accomplish this as early as TL13 but this does not cause as much fear in the general public.

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Nanos can however be created with destructive purposes and deployed with hostile intent. These include medical nanos designed to damage a body, effectively turning a single person into grey goo or excavation nanos set loose to destroy a building or fortification.

There is little defence against tailored medical nanos already inside a body, as they are designed to operate autonomously, but there are many simpler ways to kill a person. Aggressive counter-nanos could be developed to fight the damaging nanos or other nanos could work to repair damage, in either case leading to a war inside the person's body that may have additional side effects. Prophylactic nanotech defence packages are medical packages that can provide DM+1 to resist nanotech infections. Unlike characteristic enhancement packages, these packages stack linearly.

Against excavation nanos, which could theoretically also dissolve a body, there are two lines of defence: First, an excavation nano requires a swarm controller, which could be disabled, jammed or spoofed; second, regulated nanos require two failsafes, one of which is a shutdown signal, the other a failure of communications, although this may be a timed check-in feature of up to an hour duration to allow for momentary signal loss and work beyond the standard 50-metre range. Either preventing communications or transmitting a failsafe message shuts down hostile nanos. Another method is even lower tech. A nano is a very small machine. Simply vacuuming them up or opening an airlock door into a vacuum environment prevents them from operating.

ANDROIDS

An android or 'pseudobiological' robot is a mechanical robot encased in a chassis made to emulate a biological being. The sophistication of this physical emulation increases with Tech Level but appearance alone does not make an android emulate a biological being. Something that looks biological but acts mechanical can cause unease, known as the 'uncanny valley' effect among humans. Truly emulating a biological being has as much to do with the behavioural features associated with the sophistication of the robot's brain as it does the appearance of the robot's body.

ANDROID PROPERTIES

When first introduced at TL8, an android suffers greatly from the uncanny valley effect, especially when the robot does 'not look quite right', which leads to DM-2 on all checks involving social interaction. The uncanny valley decreases as Tech Levels and costs rise, allowing an android at TL14 with a Very Advanced brain to pass as a member of its emulated species.

Oddly, androids can avoid the DM-2 uncanny valley effect if they are intentionally designed to appear 'cartoonish' with simplified, clearly fictitious or exaggerated features and expressions; this prevents people from feeling confusion or unease over the android's less-than-perfect affect and expressions. Even with this accommodation, some may react negatively to such androids, experiencing automatonophobia, a psychological condition similar to coulrophobia, the fear of clowns.

The android has obvious size and locomotion limitations imposed by the species it is emulating. For human emulators, this restricts the robot to Size 5 and walker locomotion, although smaller 'child' emulators or larger 'giant' versions are possible. The android has no armour by default and can only add up to two Slots of armour below its surface to retain its emulated shape and range of motion. Unless otherwise specified, armour or any chassis-spanning coating or environmental protection must be added during construction. Clearly, options such as reflec coating spoil any attempt to pass as biological.

The android modification requires 50% of a robot's Base Slots. In addition to the cost per Base Slot for an android modification, a 3x cost modification applies to the entire physical makeup of the robot: chassis, modifications and options, including the listed android cost per Base Slot, the robot's brain and any Bandwidth or INT upgrades or hardening. Only the android's skill packages are not subject to this multiplier.

The properties of the android and the minimum brain requirement to achieve the proper level of emulation are noted on the Androids table. If an android's brain is below the minimum complexity indicated, the android's ability to pass and conduct social interactions suffers a further DM-2.

The self-repairing property provides the same effect as the self-repairing chassis option and 'heals wounds' at a rate similar to natural healing.

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Androids

Android	TL	Minimum Brain	Properties	Cost per Base Slot
Basic	8	Basic (x) or Hunter/Killer	Barely emulating. DM-2 on all social interactions from uncanny valley effect.	Cr1000
Improved	10	Advanced	Natural-looking. Passes at a distance but uncanny valley DM-2 within 5 metres.	Cr2000
Enhanced	12	Very Advanced	Natural-looking; Invisitech. Passes in close interaction, but on a roll of a natural 2 the uncanny valley sets in.	Cr5000
Advanced	14	Very Advanced	Natural-looking; Invisitech; Self-repairing. Can pass as a biological being unless scanned.	Cr10000
Superior	16	Self-aware	Natural-looking; Invisitech; Self-repairing. Can pass even after most scans.	Cr20000

ANDROID ROBOT LEGAL RESTRICTIONS

Within the Third Imperium, many member worlds model their robot regulations upon the Shudusham Concords. The 37th Amendment to the treaty specifically prohibits 'pseudobiological robots' from presenting themselves as living beings. On some worlds, this prohibits the building, importation or operation of androids. On others it requires clear marking such as colouration, skin patterns or clear distinctions from local biologicals. Some worlds make exceptions for registered body doubles. Legally, the Concords have had no enforceability since the foundation of the Third Imperium and many worlds have no restrictions on androids at all. On high-tech worlds where androids are banned or heavily regulated, a black market often exists.

BIOLOGICAL ROBOTS

A biological robot or 'biobot' is a living organism, albeit one that may have been grown in a vat and implanted with an electronic brain inside its bony skull.

At TL16, an advanced fabrication chamber can 'print' a biological being but at lower Tech Levels, a biological entity must be genetically designed, either from a natural or modified template or from an entirely artificial genome, then grown, usually in a large bioreactor or vat. This process is similar to one used for growing clones and subject to the same considerations and effects if an organism is created quickly, rather than by cell division and growth.

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BIOLOGICAL ROBOT PROPERTIES

All biological robots have 'Natural-looking' and 'Self-repairing' properties – meaning healing, not the chassis repair option, although that option can be added separately. The interface between a biobot's robot brain and its biological body is detectable, especially at lower Tech Levels. A biological robot requires the biological body option.

As with an android, the biological robot option triples the physical cost of the robot, up to and including the brain and its modifications. The biological robot option requires 75% of a robot's Base Slots and limits the robot to 'natural' locomotion modes, which should match the organism being emulated. This usually results in a walker configuration, although aquatic and flight modes are possible as a primary or secondary locomotion type if the biology supports it.

Much like an android, a biological robot requires a minimum brain configuration to avoid an uncanny valley DM-2 to social interactions. The biobot's body may be natural but its reactions will be stiff and appear artificial if the brain requirement is not met. Automatonophobes tend to react negativity to a known biological robot, even if it appears entirely natural.

Standard robot endurance values do not apply to biological robots; they must eat, drink and breath just like a living being. Coatings and environmental protections are not available unless they are part of a biobot's genome. Starting at TL13, biobots are often based around quick-grown clones and suffer the same lifespan limitations. A biobot may use any personal augmentations from the *Central Supply Catalogue* (pages 86 –93) or from the Cyborgs section of this chapter at the same cost and effects as a normal biological being.

In civilisations focused on biological sciences and adept at biotechnology, the TL for biobot features can be reduced by two to four levels at the discretion of the Referee, but minimum brain restrictions (and those brains' minimum Tech Levels) still apply.

BIOLOGICAL ROBOT LEGAL RESTRICTIONS

Legal restrictions applying to androids generally apply equally to biological robots, although in certain jurisdictions clever legal arguments using ambiguities present in the original wording of the Shudusham Concords' 37th Amendment allow for loopholes excluding biobots from these restrictions.

CYBORGS

A cyborg is any biological being with a robotic component. In common parlance, a cyborg is the converse of a biological robot; whereas a biological robot has a robotic brain and a biological body, a cyborg has biological brain and a robotic body in part or in whole. However, in some instances, an essentially biological robot may have a cybernetic part. While in principle a biological robot could have a full-body cyborg chassis, this is a very expensive and convoluted method for creating a standard robot, incurring triple costs for no gain.

Standard cybernetic augments are treated well in the Personal Augmentation section of the *Central Supply Catalogue* on pages 86–93. These rules do not invalidate the guidelines and items presented in that section but allow for greater detail in designing custom cybernetic components and the implications of their usage.

Biological Robots

Biological Robot	TL	Minimum Brain	Properties	Cost per Base Slot
Basic	11	Basic (x) or Hunter/Killer	DM-2 on all healing checks. Emissions from the electronic brain or interfaces are detectable by attuned scanners and by any psionic life detection.	Cr2000
Improved	13	Advanced	Treat detection of an artificial brain as DM-2 on any scanner check, including psionic life detection.	Cr5000
Enhanced	15	Very Advanced	DM+2 on all healing checks. DM-4 on any scanner check, including psionic life detection.	Cr10000
Advanced	17	Self-aware	DM+4 on all healing checks. Indistinguishable from a fully biological being, even psionically.	Cr20000

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Cybernetic augments include various implants and body part enhancements or replacements up to and including a full body 'brain-in-a-jar' replacement of nearly every biological component of a body. While cybernetics may provide benefits to the Traveller, they also create challenges for the recipient of a legal, physical and mental nature.

CYBERNETIC INTERFACES

In many cases, the most sophisticated and expensive portion of a cybernetic augment is not the cybernetic part itself but its interface to a living being. Links to brains and peripheral nerves to allow cybernetics to function require complex electronics and delicate installation procedures. Normally these interfaces are used to connect the brain to a cybernetic limb or sensor but can connect to other devices, whether internal or external to the body.

An individual may install an unlimited number of cybernetic interfaces but a cyborg with many augments can substitute disparate interfaces by implanting a TL13 neural link and biological-initiated avatar control system (BIACS) as a master controller to allow management of all augments connected to the cyborg's body.

Cybernetic Limbs Interfaces

Cybernetic limbs require a limb interface for each cybernetic limb controlled by the brain. The interface is an implant that allows mental control of the limb but limits the DEX of the limb. The actual DEX of a limb is constrained by the lower of the controller's rating or limb's DEX. Starting at TL10, cybernetic limbs and interfaces include full haptics, providing sensations indistinguishable from a natural limb. Also, at TL10 and beyond, cybernetic limbs are powered by the energy of the biological body itself.

Cybernetic Arms

A cybernetic arm is designed like a robot manipulator. For human arms at TL10 and below this is a Size 6 manipulator; at TL11+ it is a Size 5 or smaller manipulator. Costs for an arm are triple the equivalent of a robot manipulator of the same characteristics, including the cost for its Size and any increases to STR or DEX from the Manipulator Characteristics table on page 26. The arm itself has three available Slots for options, including additional armour and internal fittings such as tools and weapons. For options such as coatings that consider the limb as a whole, an arm is treated as having four Base Slots, similar to a Size 3 robot. Options are available at standard prices and not subject to the 3x rule for the arm itself but all costs for the structure, capabilities and interface of a cybernetic part are subject to percentage increases from the Other Cybernetic Options table on page 93 for additional optional features such as Detachable or Natural-looking.

An example TL8 arm with STR 12 – one more STR than standard for a Size 6 manipulator – costs 6 x Cr100 + 1^2 x Cr100 or Cr700 multiplied by 3 for Cr2100. Add Cr20000 for the limb interface and the arm has STR 12 and DEX 5 for Cr22100. To increase the DEX from 5 to 7 add 3 x Cr200 x 2^2 or Cr2400, which brings the total cost to Cr24500.

A TL11 STR 15 arm, a Size 5 equivalent, costs three times 5 x Cr100 + 6^2 x Cr100 or 3 x Cr4100 equals Cr12300 plus the cost of the limb interface, assuming an unchanged DEX value of 7 at TL11.

Cybernetic Legs

A human-sized cybernetic leg is larger than an arm, treated in construction cost as a Size 6 manipulator regardless of TL. The leg also carries the triple cost multiplier for cybernetics. Otherwise, the limb is treated as having four available Slots and six Base Slots. The DEX of a leg is not normally adjusted but for Agility (dexterity) checks requiring the movement of legs, including dodging, balancing and zero-G movement, the leg's DEX is equal to the standard value of TL ÷ 2 +1 with increases priced as with any Size 6 manipulator.

For purposes of running, when both legs are cybernetic, movement speeds beyond the standard rate (six metres for humans) can be achieved in the same manner as a STR increase – as less fine motor

Limb Interface	TL	DEX	Limb Endurance	Cost
Basic	8	6	300 hours	Cr20000
Improved	10	10	Infinite	Cr10000
Enhanced	12	12	Infinite	Cr20000
Advanced	14	15	Infinite	Cr50000

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skills are necessary – at a cost equal to the increase from six squared times Cr100 times the Size (6) of the leg. The total movement rate is limited by the DEX level of the limb interface. For example, to build human cybernetic legs capable of a movement rate of 12 metres would require one enhanced interface per leg and 3x (Cr100 x 6^2 + 600) or Cr12600 per leg.

CYBERNETIC LIMB CONSIDERATIONS

For tasks where natural limbs and cybernetic limbs have differing characteristics, tasks performed solely by the artificial or natural limb use the characteristics of the limb in question, but for those requiring the use of multiple limbs, the average of the limbs in question controls the modifier to STR or DEX. END is not modified by cybernetic limbs, unless both legs are cybernetic, in which case for walking or running tasks it is effectively END 15.

Custom limbs require time and effort to locate. Clinics may charge a considerable surcharge and waiting times may stretch into weeks, although the installation procedure itself generally takes only a day. A recipient needs 1D weeks to become fully comfortable with the use of the cybernetic limb if it varies in size or performance from the natural limb. If a limb is added, such as a third arm, this acclimation period is doubled.

A cybernetic limb interface may also connect to a device that is neither limb, sensory or organ, such as an implanted computer or tool via internal artificial nerves. A physically connected object may be as large as a limb; a Traveller could control a chainsaw in addition to or instead of their arm with a limb interface if desired.

If the limb interface is connected to a wireless data link or transceiver, the Traveller could cybernetically control external tools with similar complexity to a limb. For example, the Traveller could control a crane but controlling a vehicle requires a more sophisticated interface such as a drone or avatar controller and Electronics (remote ops) skill.

Control of multiple non-limb devices is limited by the same rules as performing multiple actions or using multiple skills, with each additional external use increasing task complexity by one level for all simultaneous tasks. This does not include control over a 'standard' number cybernetic limbs, sensors or organs attached to the controller's body.

Cybernetic Senses

Cybernetic senses begin with relatively simple hearing devices such as cochlear implants, proceed to artificial eyes of increasing resolution and range, and include the most complex sensors of all, cybernetic olfactory sensors.

Cybernetic Sensory Interfaces

Cybernetic senses require two components, a cybernetic interface to the brain and the augment itself. Interfaces can control only one sense but may control more than one sensor, for instance one interface may control two eyes, while another may control two ears. Additional sensory input beyond what is 'normal' for a species requires one additional interface per sensor to help interpret unaccustomed stimuli. These additional interfaces – for instance one controlling a third eye, even if the other two eyes are natural – costs twice as much as the standard interface of that type.

Sensory Interface	TL	Cost
Auditory	7	Cr2000
Visual	8	Cr10000
Olfactory	9	Cr10000
Taste	9	Cr10000

Cybernetic Sensor Implants

Auditory (ear) and visual (eye) sensors are available individually but the olfactory sensor (nose) is a single sensor unit. A cybernetic tongue sensitive to taste is available at the same cost and sensitivity as a cybernetic nose. Standard ranges and capabilities refer to human options; other races, such as Vargr, may require more advanced technology to match their natural capabilities.

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Cybernetic Ear (each)	TL	Effect	Cost
Basic	7	Standard hearing range (20 to 20,000 hertz)	Cr1000
Improved	9	1 to 100,000 hertz, low volume, Heightened Senses	Cr5000

Cybernetic Eye (each)	TL	Effect	Cost
Basic	8	Low resolution vision; DEX -2	Cr5000
Improved	10	Standard resolution vision	Cr10000
Enhanced	13	Binocular zoom, IR and Light Intensifier, IR Vision	Cr10000
Advanced	14	PRIS Vision, IR/UV Vision	Cr20000

Cybernetic Nose or Tongue	TL	Effect	Cost
Basic	9	Crude olfactory sensor	Cr5000
Improved	11	Vargr-level sensitivity, Heightened Senses	Cr10000
Advanced	13	Trace chemical detection, Heightened Senses	Cr20000

Cybernetic Organs

Replacement of organs with mechanical devices has a long history but a narrow application. In most cases, biological alternatives, such as transplants or regenerated organs, are the preferred method for replacing a destroyed or damaged organ. In some cases, such as lack of availability of transplanted parts or taboos against transplantation or cloning, artificial organs become the best available option. Cybernetic organs do not require special interfaces.

At TL7 basic cybernetic organs become available but these require external power sources or battery packs, limiting mobility. These primitive organs have a high degree of failure. Implantation is a Very Difficult (12+) Medic (1Dx4 hours, EDU) procedure, with a negative Effect indicating the dice of damage sustained by the patient. Any positive Effect may act as a DM to the weekly 6+ END check required to remain healthy. Negative Effects from this weekly roll equal damage sustained from a failing or malfunctioning device. This damage can be healed with medical care. At TL8 these basic organs are more reliable, allowing DM+2 on both implantation and weekly survival rolls.

At TL9 reliable internally powered artificial organs become available. These still require a Difficult (10+) Medic (1D hours, EDU) procedure to install with the same risk of damage from negative Effects but, if successful, the organ functions without risk of malfunction, although they require annual maintenance like a robot.

At TL11 and above, organs become self-repairing and require an Average (8+) Medic (1 hour, EDU) procedure to install. By TL13 advanced artificial organs are superior to the natural and grant the recipient an overall END +2; this increase is only applied once, not once per organ.

Each organ requires a separate cost and procedure, even if linked. For instance, a heart and double lung transplant requires three organs and three procedures but if installed during the same set of procedures, the recipient only requires one weekly END roll with DM-1 for each additional organ. Cost assumes a major organ such as a heart or lungs. Simpler organs such as a liver or kidney cost half this but incur the same risks.

Cybernetic Organ	TL	Effect	Cost
Basic	7	Procedure: (12+); Weekly survival: 6+ END; external power required	Cr50000
Improved	9	Procedure: (10+)	Cr50000
Enhanced	11	Procedure: (8+); Self-repairing	Cr100000
Advanced	13	Procedure: (8+); Self-repairing; END +2	Cr200000

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Neural Comm	TL	Effect	Cost
Basic	10	Neural Comm: Audio, 5km comm, wireless data link	Cr1000
Improved	12	Neural Comm: +Visual, Computer/0	Cr5000
Advanced	14	Neural Comm: + Full sensory, Computer/1	Cr20000

Neural Link	TL	Effect	Cost
Basic	13	Neural Link with Neural Lace + Neural Comm (improved)	Cr30000
Improved	14	Neural Link with Neural Lace + Neural Comm (advanced)	Cr45000

Neural Implants

A Traveller may implant a computer or mobile comm and link it to their brain. At TL10 this implant can operate as a mobile comm, a short range (five kilometre) transceiver/wireless data link unit that can be operated by thought or subvocalisation. Standard neural comms are detailed in the *Central Supply Catalogue*, page 91.

The short-range comm can be updated to include Zero-Slot transceiver upgrade communications options, such as an encryption module, by adding triple the standard cost of the option to the cost of the neural comm. No more than five Zero-Slot options can be added to the neural comm, all at triple cost. At TL15 the advanced neural comm can be upgraded to Computer/2 functionality at an additional Cr10000.

More advanced than a neural comm is a neural link, which introduces motor control through a complete neural lace. The initial implant is available at TL13 and includes all the features of the TL12 neural comm. A Traveller may not have both a neural comm and neural link installed simultaneously; the upgrade process involves replacement of the neural comm. As with the neural comm, the transceiver can be upgraded, as can the computer at TL15 and up to five Zero-slot triple cost options can be added. The neural link allows use of Expert systems for physical skills and provides a mechanism for remote control of the Traveller's body in a manner similar to a drone interface.

Robot Brain Implants

Even more advanced than the neural link is the robot brain implant. A robot brain installation requires a neural link. The implant is a brain with at least Advanced complexity and can communicate directly with the Traveller's brain, normally in a conversational manner, but optionally through the installation of a remote-initiated biological avatar control interface (RIBACI) between the brains. A robot brain implant is size-limited and cannot include a brain bandwidth upgrade until two Tech Levels beyond its indicated Tech Level.

Miscellaneous Cybernetics

Other devices may be implanted in a biological body and attached to the brain for control. For simplicity, these devices require a cybernetic interface equivalent to a limb interface or can be controlled by an existing neural link. The devices themselves cost three times as much as a standard version of such devices and may not be larger than one Slot or two kilograms each. No more than three such devices can be implanted.

Full-body Cybernetics

The ultimate in cybernetics is the so-called 'brain-in-a-jar' or 'brain-in-a-box' full body replacement. In this scenario, a biological brain is placed within a robot body. This procedure is inherently dangerous and can cause lasting psychological harm even if entirely successful. The procedure is only available at TL12 and above, and is illegal on many worlds and frowned upon on most others.

Robot Brain Implant	TL	Brain	Cost
Basic	13	Advanced, Bandwidth 2, INT 8	Cr100000
Improved	14	Very Advanced, Bandwidth 3, INT 9	MCr1
Enhanced	15	Very Advanced, Bandwidth 4, INT 10	MCr1.5
Advanced	16	Very Advanced, Bandwidth 5, INT 11	MCr2

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Full-body Cyborg	TL	Slots	Survival	Degradation Check	Cost
Basic	12	3	Formidable (14+)	Monthly INT 4+	MCr1
Improved	14	2	Very Difficult (12+)	Annually INT 5+	MCr2
Advanced	16	2	Difficult (10+)	Annually INT 3+	MCr5

Survival indicates the difficulty of the Medic (1Dx4 hours, EDU) check related to the implantation procedure. A Science (robotics) (one hour, EDU) check of one degree lesser difficulty during robotic body preparations can be added to a task chain. Failure with Effect -1 indicates an abortive procedure that may be attempted a second time; failure with Effect -2 or greater results in brain damage causing a permanent decrease of INT and EDU equal to the Effect, distributed between those characteristics and DM-2 on any subsequent attempts. A failure with Effect -6 results in irrevocable brain death.

Degradation Check indicates the long-term viability risks of the transplant. The recipient must roll as indicated to avoid permanently losing one point of INT or EDU, determined randomly. If the optional STY characteristic is used, the recipient must make a second check to avoid also losing one point of STY. INT and STY modifiers apply to these checks.

Cost includes all interfaces to the robot body but not the robot body itself. The robot may be anything from a Size 2 box to a humanoid robot to a vehicle or spacecraft. Major deviations from the basic limb structure of the original biological body impose DM-2 to the Degradation check. Major deviations include replacement of limbs with other forms of locomotion but only if legs are no longer present. For instance, adding grav locomotion while retaining walker mode does not incur this penalty.

Other Cybernetic Options

Cybernetic augments may add options listed on page 93 of the *Central Supply Catalogue*. For completeness, this section is summarised below.

The detachable option is only available to external cybernetic augments. It allows the Traveller to disconnect the augment using a specialised socket. This can be done for storage, disguises or to allow multiple augments to fit into the same socket. The disconnection process requires a Significant Action, as does reconnection.

An augment with invisitech is made from materials that do not trigger a scanner, sensor or mechanostatic listener. Other than medical examination or direct contact with the augment, there is no electronic way to sense its presence. At TL16, invisitech also foils psionic scanning such as clairvoyance.

A natural-looking augment is constructed like an android component with a layer of synthetic skin and hair over a cybernetic augment to make it seem more organic and lifelike at a passing glance. This option helps the augment blend in with the rest of the Traveller's body, granting DM+2 to all Deception checks made to hide the nature of the augment. At TL14, this bonus is increased to DM+4.

All circuitry and electronic components of a ruggedised augment have been hardened. This makes the augment immune to energy-based weaponry targeting augments specifically or which cause adverse effects based on the presence of cybernetic augments, such as electromagnetic grenades and ion weapons.

A self-repairing augment uses nanomachines to allow an augment to heal 'naturally' instead of requiring special attention by a cyberneticist. It does not provide the same protection as the self-repairing chassis option.

Other Cybernetic Options

Item	TL	Cost
Detachable	9	Cr5000, +25% of augment
Invisitech	12	+100% of augment
Invisitech	16	+200% of augment
Natural-looking	10	+25% of augment
Natural-looking	14	+75% of augment
Ruggedised	8	+25% of augment
Self-repairing	14	+100% of augment

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In addition to the options listed above, a detachable augment can be made able to operate separately from the Traveller's body for Cr10000 to install a remote interface. Additionally, this augment may add a grav locomotion option, allowing the augment to be controlled while detached and operated as a grav-propelled object capable of six metres of movement per Minor Action. This movement range is restricted to the communications range between the augment's interface and the augment itself, which is a 50-metre wireless data link, unless both transmitter and receiver have installed transceivers.

All options that add capabilities to an augment are additive if indicated with a percentage cost and include increases to the interface cost but all added fixed costs are computed prior to the percentage increases.

Item	TL	Cost
Remotely-operated detachable augment	11	Cr10000
Grav-propelled detachable augment	13	+200% of augment

AGENT WAFERS

Normally, a wafer jack expert system allows aided control to enable the user to accomplish physical tasks based on the Expert skill installed. It supplements control of the user's consciousness but does not override it. Optionally, specialised agent wafers can allow a temporary overwrite of a recipient's conscious state. To use an agent wafer, the recipient must have a TL13 or higher wafer jack (page 92 of the *Central Supply Catalogue*) and at least a basic neural link.

The process that creates an agent wafer is destructive, destroying the brain while scanning it, and the overall effect on the recipient of an agent wafer is temporary, lasting 30 days before the recipient's personality reverts. Agent wafers can only be created in specialised government facilities and commercial use is prohibited, as the process invariably kills the person whose brain is recorded.

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AVATARS

In addition to controlling drones, a robot equipped with an avatar controller may control a robot by initiating a copy of its personality and at least some of its programming. This receiving robot is usually referred to as an avatar host. Additionally, avatar controllers, devices and interfaces are available to allow biological beings to be both avatar controller and host.

Avatar Controller

The avatar controller is a more immersive version of a drone interface, allowing the controller to have full presence and 'become' the target avatar. At higher Tech Levels, a robot may control multiple avatars. Unlike drones, these avatars can operate independently, performing tasks without the intervention of the robot but still part of its linked mind. As such, avatars do not suffer a negative DM for performing tasks independent of their controlling agent.

The recipient avatar host must have at least an Advanced brain and can run any skill package available to the controlling brain, subject to the host's own Bandwidth limitations. The avatar controller requires a transceiver and provides a real-time feed between the linked robotic brains. The controlling robot must have at least an Advanced brain and may only have one avatar controller installed.

Avatar Controller	TL	Slots	Maximum Avatars	Cost
Basic	11	2	1	Cr50000
Improved	13	1	2	Cr200000
Enhanced	14	1	4	Cr500000
Advanced	16	1	8	MCr1

Avatar Receiver

A robot acting as an avatar host requires at least an Advanced brain and must be equipped with an avatar receiver, an option that also acts as a drone interface. The avatar receiver is a one-Slot option available at TL11 and costs Cr10000. To receive direction or updated skill packages from its controller, the receiver requires a transceiver but can buffer up to a week's worth of 'experience' to transfer back to the controller if communication is disrupted. While acting as a host, an avatar robot is limited to skill packages available to its controller but various hardware options, such as a fire control system or recon sensor may grant it 'skills' independent of the controller's skill packages. The host assumes the 'personality' of the controlling robot until released from control.

Item	TL	Slots	Cost
Avatar Receiver	11	1	Cr10000

Remote-Initiated Biological Avatar Control Interface

A robot brain can assume control of a biological body through the use of a remote-initiated biological avatar control interface (RIBACI). Installed in the biological host, who is often referred to as a 'meat puppet', this system acts as the biological host's equivalent of an avatar receiver and must be installed in a host with a neural link. The remote brain controlling the body requires an avatar controller and can either be an implanted robot brain within the body, a brain linked via wireless data link connection, or a transceiver to the controlled body.

When active, the implant allows complete control of the actions and conscious thoughts of the recipient. Often, the implant is installed in a quick-grown clone with an undeveloped brain. When installed in a fully developed brain, external control may degrade (on a 2D roll of 12 checked daily), enabling the native personality to reassert itself. While the implant has a buffer to store the external brain's personality, a brain that fails to communicate with its biological avatar loses control of it much more easily (on a 2D roll of 9+ daily for a developed brain). Undeveloped brains, or those 'wiped' by medical intervention, are not subject to this loss of control.

Use on a developed brain is illegal in most jurisdictions and use on an undeveloped brain may run afoul of regulations that prevent a machine from passing as biological. Prolonged use on a developed brain can lead to psychological problems. A recipient must roll 3+ for every 30 days of cumulative external control to avoid losing one point of INT. If the optional STY characteristic is used, a recipient must roll 4+ monthly to avoid losing a point of STY.

Note: For more information on the Sanity characteristic, refer to *The Traveller Companion*.

Item	TL	Cost
Remote-Initiated Biological Avatar Control Interface	13	Cr100000

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Biological-Initiated Avatar Control System

The opposite of a robot brain controlling a biological body is a biological brain controlling a robotic body using a biologically initiated avatar control system (BIACS). This implant acts as a basic avatar controller installed in the controlling biological brain and requires a neural link. Using the transceiver component of the neural link, the BIACS allows remote presence in any single robot with an avatar interface or remote control of any robot with a drone interface.

A biological-initiated avatar experience is different from that of robot-initiated control. The biological 'consciousness' is 'suspended' from the original body and 'transferred' to the avatar, allowing the host to use all mental and physical skills (within host characteristic limits). The host retains any 'hard-wired' skills from sensors or fire control systems. If communications links are severed, the controller regains consciousness and the host reverts to local control. It is also possible for one biological to control another biological with a BIACS to RIBACI link.

Item	TL	Cost
Biological-Initiated Avatar Control System	13	Cr100000

CLONES

A clone is a biological being created by artificial means. It could be a copy of an existing individual or naturally occurring organism, or a custom-created version thereof.

Clones differ from biological robots in that they are entirely biological, including their brains. However, a clone with its brain removed is often a template for a biological robot. Clones may be grown in a variety of ways, from natural implantation and gestation to bioreaction chambers, often called vats or tanks, which might accelerate the maturation process of the organisms. Some biological beings naturally create clones by a variety of methods including budding and parthenogenesis.

CHARACTERISTICS

If a clone body is based on a Traveller's genetic code, the clone will be similar to the Traveller but not identical. An adult has experienced both genetic and environmental factors during growth to adulthood. To simulate this effect, the clone is considered to have STR, DEX, END and INT characteristics each based on half the Traveller's original 18-year-old value (round down – cloning is not perfect) plus 1D. At TL13 and above, clones can be 'tweaked' to ensure favourable maturation and instead of 1D, the clone adds D3+3.

A clone has no initial EDU. A vat or quick-grown clone gains no EDU until after emergence from a vat unless implanted with a wafer jack and forced learning system. An accelerated growth clone can receive basic language skills if properly educated during an 18-month growth period.

The SOC of a clone is dependent on the culture. In some cultures, clones are treated as any child and inherit the SOC of their parents. Third Imperium law forbids the enslavement of sophont biological species and, by legal precedence, this includes clones but outside the Imperium's territory (and sometimes within) a clone is considered to be property with SOC 0, treated no differently than a robot.

GROWTH RATE AND AGING

A clone is a biological organism and without technological assistance will grow and develop at a rate consistent with its species. Artificially created biological organisms might have a faster than 'normal' growth rate and some medical treatments may accelerate growth and development.

At TL13, a 'quick-grown' human clone can develop at 50x normal growth rate, maturing to age 18 in approximately 18 weeks or four months. This technology requires an advanced bioreaction chamber as described on page 50 or a dedicated clone vat (see page 51). The quick-grow procedure is closer to fabrication than development and the growing body remains unconscious for the entire period, emerging with all the knowledge and abilities of a new-born if no development aids are introduced. The process places a great strain on the clone's cellular structure, impacting aging to a major extent; a quick-grown

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clone body ages at twice the standard rate. Eight years after the clone's emergence from the vat, the clone is the equivalent of a 34-year-old and must make an aging roll with DM-4, two years after that, the clone must make another aging roll with DM-5. Most quick-grown clones do not last much past 30 years from their emergence from the vat.

If a clone is intended to endure for closer to a natural lifespan, starting at TL10, the clone can be grown at 12x acceleration. This accelerated process requires 18 months or 1.5 years to grow a clone to age 18 but during that time period, the clone can maintain consciousness and learn basic skills. This process requires alterations to the clone's genetic sequence and initialisation for the first six months of its 'life' in an enhanced bioreaction chamber, from which it will emerge as a child. Constant medical attention and access to an enhanced bioreaction chamber for the developing clone's sleep periods is required to achieve full growth in 18 months. After reaching adulthood, the clone ages at a more or less normal rate but suffers DM-2 to all aging rolls, which begin after the second, not fourth, term. This means that eight years after reaching adulthood the 26-year-old accelerated clone must make an aging roll equivalent to that made by a 34 year-old natural being but another aging roll is not required until four more years have passed.

Clones grown at standard rates are possible as early as TL8, reaching 18 years of age after 18 years, as normal biological beings. These do not suffer the advanced aging penalties. Naturally aging clones may be implanted in a biological mother or grown to 'birth' in a bioreaction chamber of at least enhanced complexity.

REPLACEMENT PARTS

A whole clone can be grown from an individual for replacement parts, including a whole-body replacement with a brain implantation as technology progresses. Using cells from the original eliminates the chance of rejection but a whole-body clone introduces ethical and technical challenges.

To avoid growing a sentient being for spare parts, a whole-body clone is usually modified during early development to remove higher brain functions, leaving nothing but a brain stem to keep the body alive. Such a body remains in a comatose state even after reaching adulthood. The very rich may grow such a body to adulthood, then store it in a low berth until needed.

If parts from a quick-grown clone are implanted in a normal being, they may affect the rate of aging of the individual even if the parts are much younger than the individual as a whole. Small organs or tissues, such as eyes and hands, do not impose penalties but whole-limb replacements or replacement of major organs imposes a permanent DM-1 on future aging rolls. This penalty does not occur if parts are harvested from a 12x accelerated growth or naturally developed clone.

Body parts repaired by regenerative medicine are not subject to this restriction, despite them regrowing at an accelerated rate. These parts are grown from the patient's own stem cells via a different process, usually onto a framework of temporary dissolving inert material and integrated gradually into the body.

BRAIN TRANSPLANTATION

The technology to transplant a brain into a new clone body is available as early as TL11 but it is a dangerous process. A successful brain transplant requires a Formidable (14+) Medic check (1Dx4 hours, EDU). This procedure cannot be done using the 'Going Faster or Slower' rules; it is already being done as carefully as possible. The check receives DM+1 for every TL above 11 of the facility performing the operation. A failed attempt results in the patient's death; a marginal success results in side-effects or complications of the Referee's choosing. If the clone body has been genetically altered from the original or is quick-grown, an additional DM-1 applies.

Even if successful, the end result is still an old brain in a new 18-year-old body. This provides relative rejuvenating effects to the brain but the Traveller's clone body suffers DM-1 to all aging rolls in addition to any effects from quick or accelerated growth of the clone body.

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Clone Technology

Clone Technology	TL	Description	Cost per Clone
Basic Cloning	8	Creation of embryonic clones that require natural implantation to grow to maturity.	Cr50000 to implantation
Spare Cloning	9	Support for growth and maintenance medical clones without higher mental functions.	Cr50000 to initialise + Cr12000 per year for storage
Accelerated Cloning	10	Initialisation of clones in enhanced bioreaction chambers for accelerated 12x growth to adulthood.	Cr200000 for 12x growth
Brain Transplantation	11	Experimental surgery to implant a brain in a clone body.	Cost of clone + Cr200000 for surgery
Quick-grow Cloning	13	Cloning vats in advanced bioreaction chambers capable of supporting 50x growth to adulthood.	Cr150000 for 12x growth Cr50000 for 50x growth

PURCHASING CLONES

Purchasing of clones can be subject to heavy regulation. It is often illegal, frequently considered immoral and, even when allowed, may be subject to waiting periods for permits, which may take longer than a quick clone maturation. As a result, a black market for clones exists, although penalties for illegal cloning or 'organ harvesting' are often severe.

Costs assume use of commercially available services. For those wishing to create clones on their own, they can purchase a clone tank as described on page 118 or, for custom clones, Clone Creator software (see page 122) with a cloning creche or vat robot. In all cases, a clone requires Cr10000 per clone in consumables to grow to adulthood.

A clone requires a template. Templates may be the Travellers themselves, purchased from a catalogue of preapproved genetic donors or built from surreptitiously gathered DNA. Templates can also be created or modified in a genetics lab using Clone Creator software. A template requires Cr10000 from sample collection to preparation for cloning.

Templates purchased or developed from a lab have additional costs, beginning at Cr10000. The base price assumes a clone with base STR, DEX, END and INT of 1D+3, at TL13 and above, of D3+6 variation. Adding more points to any characteristic costs an additional amount as indicated on the Template Characteristics table.

Additional non-characteristic factors such as exceptional appearance or for a template taken from a celebrity may increase the cost of the clone template, potentially by a factor of 10 or more.

Template Characteristics

Characteristic Base	Variance	TL	Additional Cost
3	+1D	8	Cr0
4	+1D	8	Cr5000
5	+1D	8	Cr15000
6	+1D	9	Cr30000
7	+1D	10	Cr50000
8	+1D	12	Cr75000
6	+1D3	13	Cr0
7	+1D3	13	Cr5000
8	+1D3	13	Cr15000
9	+1D3	13	Cr30000
10	+1D3	14	Cr50000
11	+1D3	15	Cr75000

TRAINING OF CLONES

Clones who develop at a natural rate are generally no different than natural children and develop accordingly, reaching maturity at age 18 with base EDU skills determined as a natural Traveller.

Clones grown at 12x acceleration mature in 18 months and spend a year of that time in a creche, learning basic skills at an accelerated rate. The ability of clones to learn in a creche setting is dependent on their INT. A creche-raised clone acquires an EDU equal to half its INT (round up) and four level 0 skills. Two level 0 skills can be subsisted for a level 1 skill. Additional creche training costs Cr20000 and adds four more level 0 skills per year. It can be continued beyond the first year

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Creche Training

Skill Level	Incremental Skill Cost	Cumulative Skill Cost	Incremental Characteristic Cost	Cumulative Characteristic Cost
0	1	1	0	0
1	1	2	2	2
2	2	4	4	6
3	4	8	8	14
4	8	16	16	30

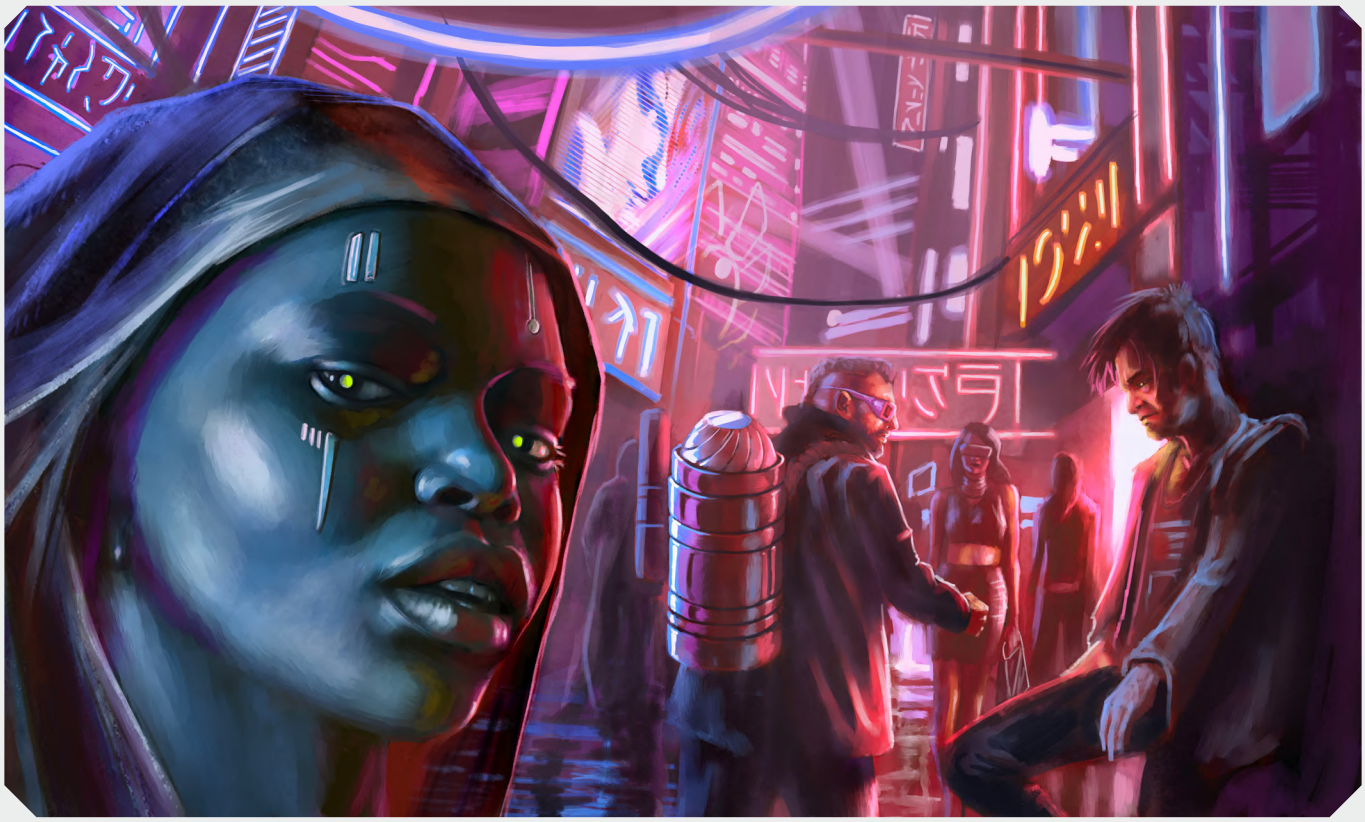
up to a total of 16 years. For clones who spend many years in creche learning, the force-growth process can be terminated early, leaving a clone as young as six apparent years after six months and aging normally thereafter. The clone still suffers the same aging disadvantages of an accelerated growth clone grown to age 18 but exits from 16 years of creche training at the apparent age of 22 instead of 34.

In subsequent creche training years, higher level skills become available. Raising a skill from level 1 to level 2 requires sacrificing a further two level 0 skills, raising a skill from level 2 to 3 requires four. Higher increases are available as noted on the Creche Training table. Level 0 skills can be 'saved' from year-to-year to achieve higher training.

STR, DEX, END and INT can be increased but require an additional two level 0 skills as indicated on the Creche Training table. EDU is a special case; until it reaches the level of INT, it increases as if two level 0 skills had been spent on it per year. Further increases follow the Creche Training table, starting at 0.

Clones grown at 50x mature in four months and have no EDU or skills at maturation. They may be trained in creches at the same rate as their slower grown counterparts, or fitted with wafer jacks for skill augmentation, although this will not confer EDU.

Once 'graduated' from a creche, a clone gains skills and experience the same as any Traveller.



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CLONES AS TRAVELLERS

Clones can be treated as biological Travellers in most instances. Rather than random creation, clone design procedures determine characteristics and creche learning substitutes for default skills.

The clone's SOC depends greatly on their upbringing and society. A clone raised as a normal child has the SOC of its parents, potentially generated by 2D if cloning is available to everyone, or 1D+7 if it is something only the rich can afford. While enslavement of a clone is technically illegal in the Third Imperium, if clones are considered property their SOC is 0. If clones are 'indentured' their SOC is 1 or 2. If clones are an underclass, their SOC might be determined by 1D or 2D3.

Clones, especially those raised in creches, might join a campaign immediately or enter a career as a normal Traveller, although certain careers or commissions, and advancement in those careers, might be limited. The Referee should decide whether a Traveller can be a clone and what limitations this places on Traveller creation.

MISSILE ROBOTS

Launched from spacecraft, missiles and torpedoes are not generally considered robots, although their status as 'smart' implies a certain amount of decision-making. Usually, this is a Primitive (homing) brain but nothing other than expense prevents more sophisticated brains or other options from being installed in a chassis based on a standard missile or torpedo bus. This section generally refers to both missiles and torpedoes as 'missiles'; design constraints for missile and torpedo-based robots are the same, although differences in Size are specifically noted.

Specialised missile robots consist of two types: those associated with the entire missile chassis and those with just the warhead or payload.

MISSILE CHASSIS ROBOTS

A robot that includes an entire missile assembly has both advantages and disadvantages. The major advantage is that it can use all available Slots. This in effect provides the robot with up to twice the available Slots of an equivalent warhead robot, depending on whether a warhead robot includes manipulators. The disadvantages are that the robot can have no locomotion mode beyond the missile's thrusters and any 'whole body' options cost considerably more since they must cover the entire chassis. Missile chassis robots that have a single brain must include a Pilot skill package to allow for controlled flight. Otherwise, they must have a robotic drone controller connected by a drone interface to a separate built-in Primitive (homing) or Basic (locomotion) brain in the missile chassis bus, allowing operation of the missile locomotion system.

WARHEAD ROBOTS

If the standard warhead assembly is removed, a missile or torpedo can act as the delivery or locomotion mechanism for a small robot or drone payload. With the replacement of a standard warhead assembly with a robot, keep in mind that a whole robot body is considered twice the 'size' of its available Slots, so a payload capacity of four Slots translates into a robot with two available Slots or a Size 2 robot. Gaining Slots by removing manipulators or locomotion from the warhead robot provides extra Slots but the warhead robot is still limited to the Payload Slots of the missile.

Warhead robots intended for independent operation must have a separate brain installed. This brain may replace the missile's own electronics and act as the missile's pilot until separation, however the extra Bandwidth required to support this set of skills is normally only included when the missile bus requires specialised local guidance or when it remains attached for an extended portion of the robot's operations cycle. A missile-delivered warhead robot can be of any type, even a small biological robot or a cluster of microbots encased in a payload shroud.

SIZES

As listed in the Missile Robots table, a missile is the equivalent of a Size 4 robot and a torpedo Size 6; a missile can house a Size 2 robot and a torpedo a Size 4. The separate robot can have a locomotion method of 'none' if it remains attached to the missile or torpedo bus, or is detached and left in orbit, but it should have its own locomotion system if it intends to move after its delivery device has expended its propellent. Refer to High Guard pages 30-33 for missile and torpedo performance, and assume missiles can manage 10 rounds of propulsion at the

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Missile Robots

Missile Size	Missile Chassis Robot Size	Missile Chassis Robot Base Slots	Payload Slots	Warhead Robot Size	Warhead Robot Base Slots
Missile	4	8	4	2	2
Long Range Missile	4	8	2	1	1
Torpedo	6	32	16	4	8

indicated Thrust while torpedoes can manage 20 rounds, as would a long range missile, though its robot carry capacity is reduced to Size 1.

The differences between missile and warhead robot Sizes and Slots apply to coatings and other options that might only apply to the warhead robot in some instances, although nothing prevents such options from being applied to the entire missile.

Removal of the warhead assembly to replace its payload mass with a robot or drone do not confer any savings to the cost of the delivery device. Missiles are produced by the billions and achieve savings through standardisation; any alteration to missiles and torpedoes listed in High Guard on pages 30 and 32 respectively are incurred in addition to the costs listed. Standard missiles cost Cr250000 for 12 or Cr24000 if purchased individually. Individual standard torpedoes cost Cr150000. Standard missile and torpedo chassis configurations are detailed in the Missile Robot section of the Robot Catalogue on page 249. As noted in the Locomotion section on page 17, a space combat missile is considered a robot with the thruster locomotion mode selected as both primary and secondary locomotion with the vehicle speed movement modification. This limits available Slots for other options on the missile bus itself, however a Default Suite and Zero-Slot options can be installed on both bus and warhead.

Note that *High Guard* missiles and torpedoes could have their Primitive brains upgraded while leaving the rest of the warhead assembly unalerted. This could confer advantages, including allowing the missile's brain to 'pilot' the missile with a Pilot (small craft) skill package but could also lead to unfortunate incidents associated with thinking explosive devices who get ideas of their own.

VEHICLE BRAINS

A vehicle designed using the *Vehicle Handbook* can have a robot brain installed instead of a computer. In all respects, the vehicle then becomes a very large robot. A robot brain and any Bandwidth upgrade options are Space 0 options on vehicles.

Vehicle Brain Interface

A vehicle brain interface is required to provide full haptics to the robot brain and allow the robot to 'be' the vehicle. These interfaces provide direct control to the vehicle's systems and cost Cr1000 per Space of the vehicle if installed during vehicle construction or Cr2000 per Space if retrofitted to an existing vehicle. A retrofit requires one hour's labour per Space. The work can be performed by Travellers skilled in Electronics and Mechanics but requires replacement and spare parts, saving the Travellers only Cr100 per Space.

A vehicle brain interface cannot be replaced by a vehicle's drone actuation system (see *Vehicle Handbook*, page 67–68), although the drone actuation system can act as a drone interface, allowing a brain equipped with a robotic drone controller to control the vehicle using Electronics (remote ops) like a drone. The vehicle brain interface is more integrated, allowing the robot to 'be' the vehicle (much like an avatar) without requiring any other control interfaces or skills. However, to drive with any skill, the robot should either have the appropriate vehicle skill or a vehicle autopilot installed.

Item	TL	Cost per Vehicle Space
Vehicle Brain Interface	10	Cr1000
Vehicle Brain Interface Retrofit	10	Cr2000

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Vehicle Brain Robots

If a vehicle brain requires any options of its own besides a Bandwidth or INT upgrade, or hardening, it must be encased in a small robot body. This robot can be as small as Size 1 and does not require its own manipulators or locomotion, gaining it as many as four Slots even at Size 1, and does not require any special interfaces to the vehicle if a vehicle brain interface is installed. A robot of Size 4 or smaller requires no Spaces but robots of Size 5 or greater require Spaces; see the Robot Size table on page 13 and use the Equivalent Vehicle Spaces column, rounding up. A robot wishing to use the vehicle as an avatar can only do so if a vehicle brain interface is installed.

Vehicle Manipulators

Vehicles of four or less Spaces may use the Vehicle Robot Manipulator Installation rules in this book but larger vehicles use the manipulator options present in the *Vehicle Handbook* on page 59.

SHIP'S BRAINS

In addition to a standard computer, a spacecraft or station may have an installed robot brain of Advanced or greater capability. Nearly universally referred to as a 'Ship's Brain' this robot brain is installed in its own chassis, often integrated into the bridge or computer control room without locomotion and manipulators but includes a modifiable Default Suite and any available robot options for a robot of its Size. A ship's brain chassis of Size 6 or smaller requires no displacement tonnage but a chassis of Size 7 requires 0.5 displacement tons and Size 8 requires one ton; double this requirement if the robot has manipulators and an installed locomotion option.

Ship's Brain Interface

Item	TL	Cost per ton
Ship's Brain Interface	10	Cr5000
Ship's Brain Interface Retrofit	10	Cr8000
+ Full Haptics	10	+Cr2000

Ship's Brain Interface

For direct control of a ship's systems, the ship's brain requires interfaces with the entire ship. This option needs a hardwired connection on the robot chassis and occupies no additional ship tonnage, although it requires Cr5000 per ton of the ship's hull to install. A retrofit requires one person day per five tons to install and increases the cost to Cr8000 per ton with a saving of Cr1000 per ton if performed by skilled Travellers instead of paid labour.

For an additional Cr2000 per ton the interface can include full haptics, allowing the robot brain to 'feel' the operation of the ship, providing an effective DEX equal to the brain's TL for any Pilot checks or operation of any manipulator-like ship's systems such as grappling arms or cargo cranes.

A ship's brain can use skill packages to perform any task a crew member can perform from a console station much like Virtual Crew software. This includes piloting, sensor operation, communication, gunnery and routine engineering tasks, but not repairs or maintenance. Even with the interface, unlike a robot vehicle brain, the ship's brain is not fully integrated with locomotive and electronic functions. A ship's brain must use the appropriate Pilot skill package to fly the spacecraft and the appropriate Electronics or Engineer skill to operate bridge or engineering systems remotely, although simple functions such as direct voice communication are possible through the ship's internal systems without any special skill. Using the interface, the ship's brain can operate internal and external doors, including airlocks.

Non-Interface Brain Configurations

It is possible to forgo the cost of the ship's brain interface and construct a ship's brain that interacts with the ship solely through the use of drones or avatars. These are subsidiary robots associated with a robot that need not be tied into the ship itself. The resultant computer brain is not truly a ship's brain and cannot use the ship as an avatar. In this case, the brain uses a robotic drone controller to communicate with a drone interface plugged into a ship's workstation or computer. Operations require the Electronics (remote ops) skill. It may use the ship's systems to communicate and receive sensory input but does not have direct control over any ship's systems. It must use drone or avatar robots to operate equipment.

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It is also possible to install a ship's brain in place of the ship's computer. This robotic brain must run all ship's functions as programs in addition to any robotic skill packages but does not require interfaces to the ship's systems to run ship software. It has access to ship's communications and sensors, and can operate doors but requires drones or avatars to perform most ship's tasks.

Operational Considerations

Any ship's brain with interfaces can run standard spacecraft software packages if it has available Bandwidth. These packages do not provide additional functionality. For example, to perform a jump, a ship's brain running Jump/1 must use Bandwidth 5 to compute the jump and must keep that program in memory while running an Astrogation skill package to complete the jump calculations then, with the Jump/1 program still running, use an Engineer (j-drive) skill package to perform the jump. However, a ship's brain running Fire Control/1 software can fire one turret without a Gunner (turret) skill package, as the Fire Control/1 software directly allows for the operation of one turret.

Drone Control

A ship's brain robot with a robotic drone controller option can operate repair drones much like Auto-Repair software, although subject to the limitations described on page 44. The robotic drone controller allows functions such as Medic or Steward tasks to be conducted through the use of repair drones if the brain has the requisite skills. A ship's brain running actual Auto-Repair software can control repair drones just like a ship's computer without a limit on the number of repair drones controlled, but with a limit on the number of repair tasks performed. Repair drones operated under Auto-Repair cannot perform non-damage control related duties.

Ship's Avatars

A ship's brain with an avatar controller can 'become' the ship much like a biological being becomes an avatar host. In addition, or as an alternative, the ship's brain can use the avatar controller to control a robot as an avatar host, generally referred to as the 'ship's avatar'. Higher technology avatar controllers can have multiple avatars, allowing the ship's brain to act as its own crew, performing multiple tasks with precision.

ASTROGATION SKILL LIMITATION

In the Charted Space universe, sentient Astrogators perform jump calculations with much lower risk of misjump than a non-sentient mind. Only a fully Conscious machine, either running Conscious Intelligence on a ship's core computer or a Conscious ship's brain can avoid this limitation; even a Self-Aware robot brain lacks the 'spark' necessary.

All jumps plotted by a non-sentient mind suffer DM-4. A review of jump solutions by even an unskilled individual with the background and basic knowledge to understand the results of the calculation, such as someone with Pilot, Navigation or applicable Science skill, can reduce this to DM-2.

Also, ships jumping without conscious sentient minds aboard suffer an additional DM-4 on the chance of misjump. If all conscious minds are inactive, for example in hibernation or controlled using a RIBACI, this DM still applies.

HIGH TECHNOLOGY

Higher Tech Levels lead to both improvements in existing technologies and the development of entirely new capabilities. Those related to robotics include advancements in avatar control, brains and fabrication, which eventually lead to the blurring of identity altogether. The advance of nanotechnology leads to metamorphic robots, open fabrication and eventually the dreaded autonomous self-replicating nanoswarm, or 'Grey Goo'.

These technologies are not generally available in Charted Space except as early prototypes or incredibly rare Ancients artefacts. At higher Tech Levels, robots become clearly superior to non-augmented biological beings and fabrication advances break down the concept of scarcity, disrupting the economic system and leading to a milieu beyond the scope of most *Traveller* campaigns. Still, high technology items are presented here to allow campaigns in universes where artificial beings are coequal to biologicals and technology begins to approach magic.

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Avatars, Brains and Metamorphic Robots

Avatar controllers continuing to improve, allowing a robot to share consciousness with more and more subsidiary units, eight at TL16 and 64 by TL18. This allows an advanced being to be in many places at once, linking back experiences to a central node.

By TL16 fully Conscious robotic brains become possible and by TL17 these brains are small enough for installation in robotic bodies. Robots with these brains become completely conscious beings, no different to a biological sophont except in structure. Limitations to task complexity and other functions, such as those in Charted Space of astrogation and jump travel, completely disappear. With self-repair and fabrication options, these machines can exceed human INT limits and become functionally immortal. They can still be destroyed but may have copied themselves and can be restored from backups. Of course, at higher Tech Levels biological beings also have these options and with cybernetic augments can keep up with their robot counterparts.

The form of robots continues to evolve with increases in technology. By TL16 an android can pass as a biological being, essentially becoming equivalent to a biological robot. By TL17 a biological being with a robot brain becomes indistinguishable from a completely biological being even under psionic examination.

At TL17 metamorphic robots become possible. These robots are composed of nanomachines on a mechanical scaffolding allowing them to morph into shapes, retaining only Size and locomotion mode as basic properties, able to create manipulators and physical features at will, and to change from a purely artificial to an enhanced android appearance in a manner of minutes. At increasing Tech Levels, this mimic ability becomes more sophisticated and faster.

Ultimately these technologies combine to allow consciousness of both artificial and biological beings to flow between bodies and even replicate consciousness at will, making distinctions between robot and natural being, individual and group, more choice than limitation.

TL	Capability	Notes	Cost
16	Avatar Controller (advanced)	Control up to eight avatars	MCr1
16	Android (superior)	Pass as biological	Cr20000/slot
17	Biological Robot (advanced)	DM+4 to heal; pass as biological	Cr20000/slot
17	Backup Brain Transfer (improved)	Non-destructive brain backup (restore to conscious)	MCr1/backup
17	Conscious Intellect	INT 15, base Bandwidth 20	MCr5
17	Metamorphic Robot (basic)	1D minute morphable to Android (enhanced)	Cr50000/slot
17	Microbot Brain	Very Advanced, Computer/4	MCr0.5
18	Avatar Controller (superior)	Control up to 64 avatars	MCr5
18	Conscious Intellect	INT 15, base Bandwidth 30	MCr1
18	Metamorphic Robot (improved)	1D round morphable to Android (advanced)	MCr0.1/slot
18	Permanent Brain Restore	Restore backup to biological body	MCr1/restore
19	Conscious Intellect	INT 18, base Bandwidth 50	MCr1
19	Continuous Brain Backup	Implant to create running brain backup	MCr1
19	Metamorphic Robot (advanced)	1D second morphable to Android (superior)	MCr0.2/slot
19	Microbot Brain	Very Advanced, Computer/5	MCr0.5
22	Individual Transformations	Switching between natural and mechanical bodies	MCr5

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Fabrication, Nanorobots and Swarms

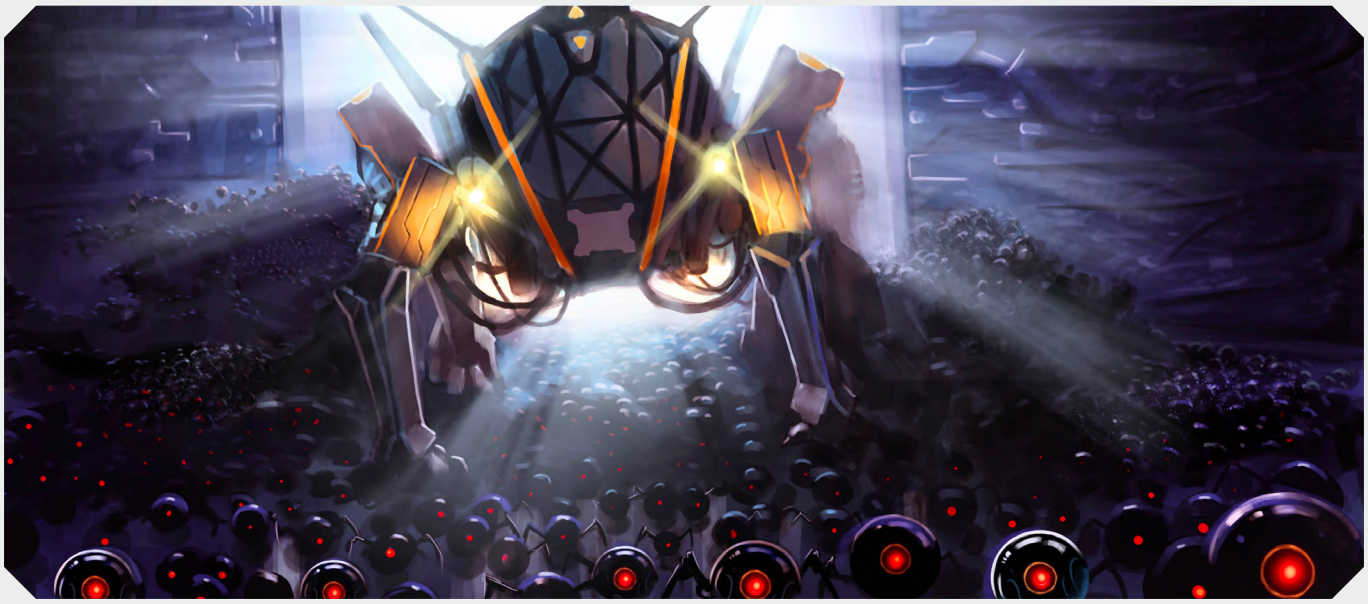
Fabrication chambers can create complex items from instructions and raw materials, much like life forms. At TL17 this becomes literally true, as fabrication becomes advanced enough to create life at the molecular level; within an hour an advanced fabricator can create a living being. This technology does not allow for the transfer of memories but does allow for the creation of a cloned body or custom designed organism. By TL19 this technology can duplicate quantum states and print a fully conscious mind with whatever memories are recorded or implanted into the being.

At TL19 microbots become smaller than a milligram, reaching the upper range of nanorobot size and allowing for complex behaviours by dust-sized robots.

Beyond TL19 construction nanoswarms can build complex objects on command, assembling them outside the controlled confines of a chamber. These processes still require external guidance from swarm controllers, although swarms themselves can create more controllers. By TL23 this requirement vanishes and swarms can replicate unchecked or transform objects in a matter of seconds, with swarms spreading geometrically to either recreate whole worlds or transform them into the apocalyptic Grey Goo.

TL	Capability	Notes	Cost
17	Fabrication (advanced)	1 hour, living beings, any robot brain	MCr0.2/slot
18	Nanoconstructor (enhanced)	Complex electronics, simple biomechanical	MCr0.1/litre
19	Fabrication (superior)	1D minutes, memory implantation	MCr0.5/slot
19	Microbot	Sub-milligram microbots	Cr50+ options
20	Open Fabrication (basic)	1 hour, external advanced fabrication	MCr0.5/slot
20	Nanoconstructor (advanced)	Living beings, any robot brain	MCr0.2/litre
21	Open Fabrication (improved)	1D minutes, external superior fabrication	MCr0.5/slot
22	Distributed Intelligence Swarm	Conscious beings of interconnected nanorobots	MCr0.2/package
23	Grey Goo	Self-replicating nanorobot swarms	None
23	Nanoconstructor (superior)	Grey Goo initiator	MCr0.5/litre

Grey Goo requires a superior Nanoconstructor, but any raw material will initiate a swarm. The swarm can and will grow geometrically every 10 minutes unless inhibited or starved of raw material.



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OTHER CONSIDERATIONS

DAMAGING ROBOTS

After calculating the total amount of damage caused by a weapon, the damage is reduced by the robot's Protection as normal and the remainder is removed from the robot's Hits. Once a robot has been reduced to Hits 0 it is considered wrecked, although parts may be salvaged or – with great effort – the robot might be rebuilt. If a robot suffers damage beyond twice its initial Hits, it is totally destroyed and has no chance of being repaired.

RADIATION DAMAGE

Robots can suffer either temporary or permanent damage from radiation depending upon the source. Ion weapons cause Stun damage, shutting down the robot brain for a number of rounds equal to the ion damage inflicted. Armour does not protect against ion attacks but hardened components are immune. A biological brain in a robot body can suffer Stun effects from an ion attack but armour protects it.

Radiation weapons cause permanent damage to a robot's brain. Radiation damage can be reduced by the hostile and radiation environment protection options. A hardened brain halves the effective radiation dose that penetrates this shielding. Remaining radiation damage has a cumulative effect on the robot's brain and cannot be repaired without replacing the brain. Every 1,000 rads affecting the robot's brain removes INT -1 and Bandwidth -1. Robots reduced to INT 0 are inoperable. Basic or Hunter/Killer brains suffer DM-1 on all checks when INT is reduced to 2 and DM-2 when INT is reduced to 1. Advanced and more complex brains may have skills lowered as their brain capabilities deteriorate. Bandwidth decreases can be alleviated by installing a new Bandwidth upgrade but this does not heal damage done to the core Bandwidth of a brain.

ELECTROMAGNETIC STUNNERS

Electromagnetic stun weapons can cause actual damage to robots. A stunner causes physical Hits, not temporary damage to robots. A normal robot's Protection is only half effective against stunner attacks but an android or biological robot's armour is fully effective against Stun damage. Hostile environment protection provides Protection +2 (not halved) against Stun damage. Radiation environment protection provides additional Protection equal to half its Tech Level, rounded down. A hardened robot brain negates the effects of all critical hits affecting the brain; these critical hits are ignored, not re-rolled. Hardening provides no additional protection from Stun damage beyond the brain but a ruggedised cybernetic augment avoids physical damage if Hit Locations are used on a cyborg.

Sonic-based stunners, such as those common in the Vargr Extents cause no damage to robots, although they may temporarily disable auditory sensors.

HACKING ROBOTS

Robots are designed to be resistant to unauthorised access and control. The first step to hacking a robot is to gain access. For robots with a drone interface or equivalent, all the hacker needs is a drone controller, the proper unique authorisation codes for the robot and two-way communications – be that via transceivers, wireless data links or direct connection. Under this set of conditions, communications access is automatic. A robot with at least an Advanced brain can try to resist an authorised drone interface control attempt by making a Very Difficult (12+) INT check. On success, the robot shuts down the drone interface and disconnects the remote communications link, at which point even an authorised user must use a hacking attempt to gain access.

A successful hacking attempt must defeat the robot's firewall defences.

First the hacker must gain access. A robot by default has a firewall with the equivalent of a Security software package running on its communications links. The sophistication of this is determined by the robot's brain as indicated on the Robot Brains table on page 66. The hacker must overcome this software with a successful intrusion attempt using Electronics (computers). The complexity of this task is Difficult (10+) for Security/0 and becomes one level more difficult for each level of Security software. The task requires 1Dx10 minutes to attempt. Each failed attempt lowers the chance of

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ANTI-ROBOT WEAPONS

Certain weapons are designed to cause damage to robots or interrupt their functioning. These may be installed on robots themselves in medium weapon mounts but are normally used by forces fighting warbots or by anti-robot activists.

Stun Rifle

A stun rifle is a larger, longer range version of the hand-held stunner. Its major advantage over a standard hand-held stunner is its effective range. The detachable power pack is mounted in the weapon's stock and not interchangeable with power packs of smaller stunners.

Weapon	TL	Range	Damage	Kg	Cost	Magazine	Power Pack Cost	Traits
Stun Rifle	12	50	3D	4	Cr2000	50	Cr200	Stun, Zero-G

Stun Shotgun

A stun shotgun is similar in size to a stun rifle but has a broad short barrel which allows it to 'blast' an electromagnetic pulse over a wider area than a typical stunner. This 'blast radius' provides DM+2 to attack rolls at up to its effective range but causes only half damage at longer ranges. The detachable power pack is stock-mounted and interchangeable with the stun rifle.

Weapon	TL	Range	Damage	Kg	Cost	Magazine	Power Pack Cost	Traits
Stun Shotgun	12	10	3D	4	Cr2000	50	Cr200	Blast 5, Stun, Zero-G

Pulse Carbine

A pulse carbine is a short shotgun-like weapon that releases an electromagnetic pulse in a focused cone, disabling electronics within its effective range. The pulse destroys unshielded electronics below TL9 and causes unshielded electronics of up to TL13 to shut down for a number of minutes equal to the attack roll's Effect. Vehicles or electronics of TL6 or below are not affected by this. Every 100 rads of radiation protection provides Protection +1 against a pulse carbine.

A robot of TL9 or less takes a number of critical hits equal to the total damage inflicted by the pulse carbine, although critical hits to a hardened brain are ignored, not re-rolled.

Weapon	TL	Range	Damage	Kg	Cost	Magazine	Power Pack Cost	Traits
Pulse Carbine	11	50	2D	4	Cr5000	50	Cr200	Blast 5, Ion, Zero-G

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success by DM-1 and Effect -6 results in detection and traceback to the attacker's location, if remote. Attempts to gain remote access to a robot with an encryption module suffer DM-4, reduced by any TL advantage the hacker has over the robot. A Parasite Link and physical contact with the robot gains automatic access or access on a straight 2D roll of 6+ if the robot's brain is hardened (this can be attempted multiple times).

Once a hacker has access to the robot's internal systems, they must attempt to gain control of the robot. This requires a second successful intrusion attempt of the same difficulty. Any positive Effect from the access task can be applied. A control attempt can use either Electronics (computers), Science (robotics) or Profession (robotics) and does not need to be performed by the same person who gained access. The existence of a drone or avatar interface in the robot provides DM+2 on the access control hack but even if the hack is successful a robot with an Advanced or better brain still has one last chance to avoid control with a Very Difficult (12+) INT check. However, any positive Effect from the successful access hack is applied as a negative DM. If the robot is successful, the hacker is detected, evicted and must start all over again. If the hacker succeeds, they have full access to the robot's brain and systems.

A controlled robot can be commanded via a drone control interface, reprogrammed (see page 79) or shut down. A hacked and shut down robot with power remaining can still be powered on. Malicious 'scrambling' of a robot's brain requires a Difficult (10+) check (1D minutes, INT or EDU), which results in a partial wipe causing a critical hit to the brain of Severity 1D.

ROBOT MAINTENANCE

Like any machine, robots need periodic maintenance to continue to function over long periods of time. Unless the robot has a self-maintenance enhancement option to delay or preclude the need for annual maintenance, continued reliable operations requires 0.1% of the robot's cost per year in spares and diagnostic checks. This maintenance can be performed by a properly skilled Traveller, with an Average (8+) Profession (robotics) or Science (robotics) check (1D hours, EDU), although Electronics (computers) can be used at DM-2. Maintenance tools and parts must be of at least the robot's Tech Level or the task becomes one level more difficult for each Tech Level of deficit.

Maintenance can be completed by a qualified servicer in a single day for the same price but only at a maintenance facility of the robot's Tech Level or higher. Most Class A and B and many Class C starports have robot maintenance workshops on site or in the adjacent startown. These can repair robots up to TL12 even if the world is of lower Tech Level but prices are doubled for each Tech Level of deficit.

If a robot does not receive annual maintenance, roll 8+ on 2D each subsequent month to avoid a malfunction. Treat malfunctions as Severity 1 critical hits and roll on the robot critical hits tables. Malfunctions are additive; if the same critical hit is rolled in a subsequent month, it increases the Severity of the critical hit. Repairs to maintenance-related critical hits cost as much as repairs to critical hits caused by damage; it is much cheaper to properly maintain a robot than fix it once it begins to malfunction.

A robot in a powered down or 'stand-by' state requires less maintenance, increasing the period of annual maintenance and monthly malfunction checks by 12x. This stacks with the self-maintenance enhancement option. A robot properly shut down and packaged for long-term storage increases these periods by a further 12x, meaning a properly stored robot with a basic self-maintenance enhancement only requires maintenance every 1,728 years and if missed, will check for malfunctions every 144 years.

ROBOT CRITICAL HITS

If an attack roll against a robot has Effect 6+ and causes damage (make sure to consider armour protection), a critical hit has been scored – some vital system has been damaged by the attack, reducing the effectiveness of the robot.

If a critical hit has been inflicted on a robot, roll 2D and then consult the Critical Hits Location table. If the location does not apply to this robot, roll again.

Critical Hits Location

2D	Location
2–4	Power Supply
5	Weapon
6	Armour
7	Chassis
8–9	Locomotion
10–11	Options
12	Brain

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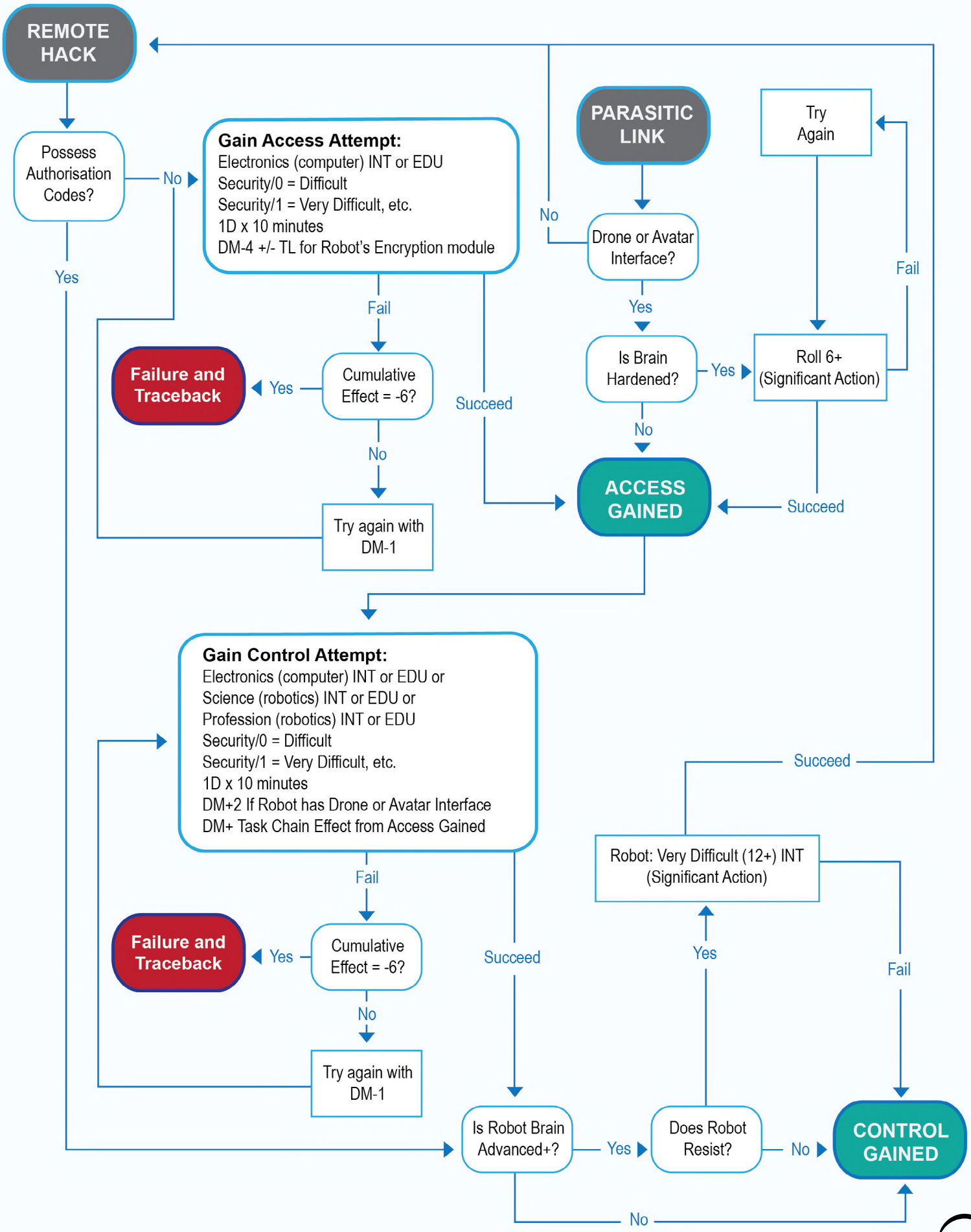
Robot Hacking Flowchart



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The Severity of the critical hit is equal to the Effect of the attack roll minus 5. Consult the Critical Hit Effects table to determine the nature of the critical hit and how it affects the robot. Any extra damage caused by the effects of critical hits ignores the robot's Protection.

If a robot has already sustained a critical hit to a location that receives another, use the Severity of the new critical hit or the original +1, whichever is higher, and immediately apply any new effects. Once a location has reached Severity 6, the robot sustains 6D damage every time the location suffers another critical hit.

SUSTAINED DAMAGE

A robot has its components degraded when it sustains constant damage. Every time a robot sustains damage equal to 10% of its starting Hits, roll 2D and then consult the Critical Hits Location table. The robot suffers a Severity 1 critical hit to that location.

REPAIRING ROBOTS

A robot that has suffered damage can be repaired at any facility with suitable maintenance equipment. Robot maintenance and repair is a complex task. For simple chassis Hits restoration, an Average (8+) Mechanic check, (1D hours, INT or EDU) is sufficient. This consumes spare parts costing Cr500 per Hit repaired.

Critical hits are more complex and normally require Profession (robotics) for an Average (8+) skill check (1D hours, EDU) with the Severity as a negative DM. Mechanic or Electronics (computers) skill can be substituted at an additional DM-2. Each critical hit repair costs the greater of Cr500 or 1% of the robot's total cost multiplied by the Severity. Additionally, components that are completely destroyed require replacement at full cost. In some cases, replacing a damaged component is cheaper than repairing it.

Critical Hits Effects

	Severity					
Location	**1**	**2**	**3**	**4**	**5**	**6**
Power Supply	Speed reduced by 1m or band	Remaining Endurance halved	Remaining Endurance halved again	Remaining Endurance halved again	Power supply explodes. Robot shuts down. Chassis Severity +1	Power supply explodes. Robot shuts down. Chassis Severity +1D
Weapon	Random weapon suffers DM-2 to attack rolls	Random weapon disabled	Random weapon destroyed	Random weapon explodes. Chassis Severity +1	Random weapon explodes. Chassis Severity +1	Random weapon explodes. Chassis Severity +1
Armour	Protection -1	Protection -1D	Protection -1D	Protection -2D	Protection -2D, Chassis Severity +1	Protection -2D. Chassis Severity +1
Chassis	Robot suffers 1D damage	Robot suffers 2D damage	Robot suffers 3D damage	Robot suffers 4D damage	Robot suffers 5D damage	Robot suffers 6D damage
Locomotion	Speed reduced by 1m or one Speed Band	Speed reduced by 1m or one Speed Band	Speed reduced by 1m or one Speed Band	Speed reduced by 1m or one Speed Band	Robot immobilised	Robot immobilised. Chassis Severity +1
Options	Random option suffers DM-2	Random option disabled	Random option destroyed	Two random options destroyed	Random option destroyed. Chassis Severity +1	Random option destroyed. Chassis Severity +1
Brain	DM-2 to one skill	DM-2 to all skills	Robot unable to perform any skills	Robot INT halved	Robot brain disabled	Robot brain destroyed. Chassis Severity +1

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Completely damaged robots can be repaired. A robot that is reduced to Hits 0 is considered wrecked and inoperable, effectively 'totalled'. For sentimental or other reasons, a robot that has received up to twice its original Hits in damage can still be repaired at great expense but it costs twice the robot's value to repair. Once a robot has taken twice its original Hits in damage, it is completely destroyed and cannot be repaired. It might be possible to retrieve some information from the brain but the remainder of its parts are only worth the going rate for scrap recycling.

USED ROBOTS

A substantial secondary market exists for used robots. Sometimes robots are discarded in favour of a new model but most often a robot is available for resale when it becomes uneconomical, either because of the owner's financial situation or because of quirks or defects that develop over time.

A used robot costs 1Dx10% less than a new one but also has 1D-1 quirks from the Used Robot Quirks table.

Used Robot Quirks

2D	Quirk
2	**Faulty Programming.** DM-1 on all checks performed by this robot.
3	**Input Errors.** The robot often misunderstands commands or instructions, falling back on behavioural routines that might be inappropriate for the situation.
4	**Output Errors.** The robot's communication responses require translation. Its output algorithms do not conform to any standards or its output is in a different language or obscure dialect.
5	**Communications Defect.** The robot's communication responses are difficult to understand. It might produce non-standard electronic output or speak with a heavy accent or in an inappropriate manner.
6	**Reduced Efficiency.** Lower the robot's Endurance by 10% and decrease its movement rate by one metre or one Speed Band.
7	**Chassis Defect.** Reduce the robot's Hits by D3x10%.
8	**Cosmetic Defect.** The robot has scratches, mismatched panels or poorly rendered artwork on its surface. This defect can be corrected at a cost of Cr200 x Size.
9	**Upgraded.** Increase the level of one option, for instance from basic to improved, or add one skill package at level 0.
10	**Upgraded Bandwidth**. Increase the robot's Bandwidth by +1. For Primitive, Basic and Hunter/Killer brains, allow one additional package mode.
11	**Upgraded Intellect.** Add +1 to the robot's INT and add a level 0 skill package.
12	**Delusions of Grandeur.** Any brain of Advanced or greater complexity believes itself to be fully sentient and acts that way. Fully Conscious brains consider themselves superior to all organic life.

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OPTIONAL RULE: SANITY

If the characteristic Sanity (STY) is used in a campaign, robots are assumed to have STY starting at their brain's Tech Level or 15, whichever is lower. After every four years in operation (not in storage or a stand-by state), a robot's STY decreases by -1. A robot's declining STY can potentially be corrected once every four years in a laboratory or manufacturing setting with a Very Difficult (12+) Science (robotics) check (1D days, EDU). For every Tech Level a robot's brain exceeds that of the facility, impose DM-2. An Exceptional Failure decreases the robot's STY by a further -1D; an Exceptional Success adds +1 to the robot's STY, to a maximum of 15. Conscious robot brains avoid this degradation on an Average (8+) INT check.

Additionally, radiation damage that decreases a robot's INT decreases STY by the same value; this cannot be reversed.

If a robot's STY decreases to 2, its behaviour becomes erratic. The robot's interpretation of commands and interactions become idiosyncratic as determined by the Referee. If a robot's STY reaches 0, it either becomes comatose or psychotic, again as determined by the Referee.

REPROGRAMMING ROBOTS

A robot brain is resistant to reprogramming. The standard method for erasing previous memories is a partial brain wipe, which resets the robot to factory settings. For Primitive, Basic and Hunter/Killer brains, this leaves built-in skills untouched but any learned behaviour or conditional program trees must be recreated.

The programming process for these relatively simple brains is the same as required when first initialising a robot at the factory, requiring an Average (8+) Electronics (computers) check (1D hours, EDU). Profession (robotics) or Science (robotics) skills may be substituted and generally halve the time required to set up a robot. Robots can be reprogrammed via a hardwire cable, which is part of a roboticist's toolkit, or via a wireless data link. Standard transceiver communications can eventually reprogram a robot but it takes 10 times as long to complete the task.

Advanced and Very Advanced brains are more complicated. While a brain wipe is possible, it also erases skill packages, which will then need to be reapplied, requiring repurchase at full price or re-installation if source files are available. The reinstallation task is similar to that for a less sophisticated brain, with each skill package (of any level) requiring a similar skill check.

A more nuanced reprogramming of Advanced and Very Advanced brains to remove memories or behavioural settings while maintaining skill packages requires a Very Difficult (12+) Electronics (computers) check (1D hours, INT) for Advanced brains and a Formidable (14+) check for Very Advanced brains. Exceptional failures can lead to undetected and unexpected conditions, damaging the skill package or only appearing to erase memories or behaviours.

Self-Aware and Conscious brains are too integrated and intricate for partial wipes to be successful. While an Impossible (16+) task might accomplish this feat, any failure, or even a partial success, might cause unintended changes to the robot's behaviour. A full wipe is recommended in these case but a robot of such sophistication is unlikely to cooperate in the process.

A brain can always be replaced. A powered down robot can have its old brain removed and a new one installed, in effect creating a 'brand new' robot with a completely un-initialised personality. All brain skill packages must be reapplied and copy-protection schemes generally prevent reuse of packages on new brain equipment.

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BACKUP AND RESTORE

A robot's brain can be backed up periodically on a separate computer system and restored to the same robot from this previous state. Restoration must be performed to a brain of identical manufacture or at least one with the same Tech Level, complexity and Bandwidth of the original. See Upgrading Robot Brains below for the implications of restoring a backup to a different robotic brain.

Both backup and restore processes require a wireless data link or hardwired connection to adequate storage with at least the same Tech Level as the robot's brain. It is possible to 'duplicate' a robot's personality and skills onto an identical brain while retaining the same personality and skills of the original. This process generally violates any licensing agreement pertaining to the robot's skill packages but has no ill effects other than potential legal and financial liability. Duplicates of the same personality running simultaneously are often referred to as 'memes'.

UPGRADING ROBOT BRAINS

Upgrading a robot brain is a larger disruption than reprogramming or installing a new brain designed for the specific robot. There are three methods for upgrading a robot brain: full brain upgrade, upgraded options such as Bandwidth or INT and upgraded brain sophistication.

FULL BRAIN UPGRADE

As long as the robot has Size and Slots to support a new brain and any associated Bandwidth upgrade option, the robot's old brain can be removed and replaced with a new brain of higher capacity straight from the factory. The process is relatively quick and can be performed in a properly equipped robotics facility in 2D hours for similarly configured brains and 3D hours for generic or novel brains with an Average (8+) Profession (robotics) check (INT or EDU) and failure generally results in additional attempts required to complete the process. The Electronics (computers) skill can be substituted for DM-2.

When transplanting a 'live' robot brain with existing skills and memories, the process becomes much more complicated, requiring a Difficult (10+) Profession (robotics) or Science (robotics) check (1Dx4 hours, INT). A 'live' robot brain in a robot of different form requires 2D3 days to adapt to its new form before being able to physically function at full capacity.

UPGRADED OPTIONS

Adding hardening to a robot brain is strictly a matter of shielding installation and has no effect on the robot's thinking capacity but requires one Slot to retrofit. Bandwidth additions expand the robot's capability to learn new skills or gain greater INT. Installed Bandwidth is immediately available for the installation of new packages, while Bandwidth intended to increase a robot's INT requires time to 'bake in'. The Bandwidth is immediately allocated but the robot gains INT over time, at a rate of one point per week.

Upgraded options can be purchased at standard cost and installed by anyone with the Electronics skill.

UPGRADED BRAIN SOPHISTICATION

It is technically possible to transfer the memories and skills of a 'live' robot into a more sophisticated brain, for instance upgrading an Advanced robot brain to Very Advanced. This procedure is rarely performed, as it often results in a suboptimal robot but sometimes it is important to retain a robot's personality.

This procedure requires a direct brain-to-brain transfer, not a restore from backup. It is not generally performed in robotics shops but requires a robotics laboratory, a robotics scientist and careful adherence to rarely used procedures and tools. A robot's brain may only be increased by one level of sophistication at a time. The base task is a Very Difficult (12+) Science (robotics) check (1D days, EDU). Individuals with Electronics (computers) may attempt this task at DM-2 but need access to the laboratory, tools and documentation. If a negative Effect results, record it and make subsequent attempts. If the cumulative Effect of all attempts reaches 0, the procedure is a success but if the cumulative Effect reaches -6, the 'live' robotic personality in the original brain is destroyed and the new brain suffers damage equal to 10% of its cost.

To avoid risking the original brain this attempt can be made on a restored 'copy' of the original brain. The backup must first be restored to an interim brain similar to its current brain with all the expense and procedure of a full brain upgrade procedure prior to the attempt to upgrade to greater sophistication.

If the procedure is successful, the robot needs to adjust to its new capabilities. For every point of INT gained in this manner, the robot must spend a full day adjusting. The procedure costs twice the cost of the new brain.

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PHYSICAL UPGRADES

Physical upgrades to robots consist of installation of additional options into spare Slots and upgrades of installed equipment to something better or entirely different. Upgrades that involve weapon systems or even just weapon mounts may be subject to stringent local regulations, often more severe than those imposed on weapons owned and operated by individuals. The Shudusham Concords and general distrust of weaponised robots casts a long shadow over Charted Space.

Purchasing new options for installation in available Slots is the simplest form of upgrade. In general, a physical option can be purchased at list price and installed in a robot, usually at a +10% premium unless the upgrade was installed at time of initial purchase. The exceptions to this general principle involve items added to the chassis such as coatings or armour and items of greater Tech Level than the robot.

ADDING ZERO SLOT OPTIONS

Most Zero Slot options can be added to a robot, up to the limit of Size + TL, beyond which spare Slots are required. Adding Zero Slot coatings is possible but only if the coatings are compatible. Adding reflec armour to a robot with a camouflage or stealth coating destroys any visual camouflage or electronic stealth benefits.

SPARE SLOTS

Many robots have spare Slots reserved for the installation of additional options. Items of higher Tech Level than the robot might require more advanced interfaces and draw more power. Adapters are available for these components but add +10% per TL difference to the cost of the component.

Adding coatings and armour that require Slots is problematic, as spare capacity is not spread across the surface area of a robot. A robot can only add one Slot worth of coatings or armour, although removal or changes of existing full-chassis options might provide space for new installations. Armour and other full coatings added to an existing robot design at purchase or later require twice the standard cost.

SCIENCE VERSUS PROFESSION

For many tasks involving robots, both Science (robotics) and Profession (robotics) skills may apply. While there is significant overlap, these skills have different foci. Science is focssed on theory and development, while Profession focuses on practical tasks and experience. Unless otherwise specified, for tasks involving repairs and maintenance, Science (robotics) suffers DM-1 but for tasks involving design or research Profession (robotics) suffers DM-1. Unless specified, either INT or EDU may aid checks, depending on the background and methodology used by the Traveller to solve the problem.

Other skills may apply to robotics task but generally with DM-2 unless otherwise stated. Tasks involving the brain can be assisted by Electronics (computers) and repairs to sensors and comms can be aided by the appropriate Electronics speciality. Tasks involving robotic limbs can be aided by Science (cybernetics) or Profession (cybernetics) and simple repairs to the robot chassis may benefit from Mechanic. A biological robot might benefit from Medic (biology) or Science (biology) for checks involving the chassis.

UPGRADED COMPONENTS

Upgrading a component to a more advanced version incurs a Tech Level-based premium and might require a different number of Slots. Slot increases must come from spare Slots or from removed components. Slots gained through miniaturisation are generally lost in the inaccessible bowels of the robot but at Referee discretion may be made available for a small item that does not suffer from being installed in an odd location. In general, weapon mounts, coatings and sensors cannot use these recovered Slots.

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Robots as Travellers

At the Referee's discretion a Traveller may be a robot. Generally, a Traveller robot is assumed to have at least a Very Advanced brain, although Self-Aware and Conscious brains are more suitable for emulating or achieving free will.

The type of brain constrains a robot Traveller's ability to use skills in highly complex tasks. An Advanced brain can only attempt Difficult (10+) and simpler tasks, a Very Advanced brain can attempt Very Difficult (12+) and a Self-Aware brain, Formidable (14+). Take note of two things: first, performing a task more slowly can lower difficulty by one level and second, this restriction only applies to INT, EDU or SOC-based checks. A robot Traveller is free to try an Impossible (16+) feat of STR.

Playing a robot can be challenging. Different levels of robot brain complexity can lead to different types of behaviours, strengths and weaknesses. Some societies might consider a robot Traveller to be a piece of equipment, a threat to their livelihood or even their survival.

Robot Traveller Creation

A robot is built not born. A biological robot or clone might come from a vat but usually emerges as an adult or child, not an infant. Each robot model is in effect a separate alien race and the Referee must determine which robots are suitable for use as Travellers. Custom robots can be created based on a concept agreeable to the Referee; these should usually be constrained by cost and Tech Level to prevent the creation of superhero-class robots, unless that fits into the campaign concept. A Traveller could be a ship's brain but in those cases it is recommended that the Traveller has an external avatar.

Characteristics

A robot Traveller's characteristics are not rolled for but result from the design of the robot and the society in which it was created.

Strength (STR): This is based on the STR of the robot's strongest manipulator. However, checks are based on the STR of the manipulator(s) actually performing each task. A robot without manipulators has STR 0, although for tasks such as smashing down a door, the robot may use a value of 2 x Size -1.

Dexterity (DEX): This is based on the DEX of the robot's most dexterous manipulator. If the robot has an agility enhancement, the value of the enhancement is added to DEX. This DEX is used for purposes of tasks such as dodging or balance but for checks reliant on manipulators, such as aiming and firing a weapon or piloting a vehicle, the DEX of the manipulator(s) performing the check is used.

Endurance (END): A robot's END is related to power available for its operation. The robot's default END is the greater of 6 or its Size. If the robot has enhanced endurance from additional power packs, as indicated by Athletics (endurance), its END is assumed to be 9 for Athletics (endurance) 1, 12 for Athletics (endurance) 2 or 15 for Athletics (endurance) 3+. A robot with the efficiency modification adds +1 to its END. A robot powered by an RTG is assumed to have END 16, reduced by half for every period exceeding the RTG's half-life.

Intellect (INT): INT is that of the robot's brain, including any INT upgrades. The restriction on task complexity based on robot brain type applies regardless of INT upgrades. For example, only a fully Conscious robot may attempt Impossible (16+) tasks and an Advanced Brain is limited to Difficult (10+) tasks, although external modifiers may modify a task to an equivalent complexity within the capability of the robot's brain.

Education (EDU): EDU is limited to the robot's skill package set. When using skills within this set, the robot's EDU is equal to its INT. General education normally comes with experience and a robot's 'life experiences' are non-existent at creation and limited by assigned duties. However, a robot effectively has total recall. For characteristic purposes, outside the direct application of package skills, the robot's maximum EDU can be considered to be its Bandwidth capacity for skill packages; total Bandwidth minus any Bandwidth used for INT upgrades. Only robots with Advanced or greater brains may gain any general EDU capability.

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Social Standing (SOC): A robot's SOC depends on the society in which it resides and the situation requiring a SOC-based check. In societies where all robots are property, robots have SOC 0. When using skills that normally require SOC, a robot may use its INT modifier instead, subject to the Referee's interpretation of the society's or individual's reaction. For example, if commanding troops who will follow orders from a robot or who do not know that the battle dress-equipped 'colonel' is actually a robot, the robot may use INT to modify a Leadership check but if the troops consider robots to be equipment, they are likely to react poorly and the robot reverts to SOC 0. In societies where a robot of sufficient intelligence is considered a citizen, SOC is determined on 2D.

INITIAL SKILLS

Robot skills are programmed, not learned. Robots do not earn background skills but receive the skill packages normally assigned to the robot by its function, although the Referee may allow a Traveller robot to pick reasonably plausible substitutes provided they do not cost more than the robot's standard package. All skill packages must be within the technological or Bandwidth limitations of the robot.

ROBOT CAREERS

Robots do not need a career and in many societies have no opportunity to pursue one. Robots are assumed to either be newly manufactured – or recently reset to factory defaults – or have performed their designated tasks for some period of time prior to starting the campaign.

In societies where a robot is property, it does not normally have an opportunity to undergo pre-career options or pick a career. The robot is assigned a career based on its purpose and it continues in the career until the creation process is complete. Alternatively, a robot could be assigned as property of another Traveller and follow that Traveller's career subject to limitations based on social status.

BASIC TRAINING

A robot does not normally undergo basic training. It begins the career equipped for the duties assigned and treats the first term as any other.

TERMS

A robot Traveller conducts a term in a normal manner, rolling for Survival, Events, Advancement and possibly Commission. Actual Advancement or Commission may be unavailable in its society; for example, a robot marine might always be rank 0 but may roll for a skill if the advancement roll is successful.

MISHAPS

Mishaps or events causing injury are treated as damage to systems, be they manipulators, sensors or power supplies. These are not repairable by medical treatment but may be repaired as indicated on page 110 for the appropriate cost and 'medical debt' may be accrued or paid for by the career's service as normal.

SKILLS

A robot may roll on appropriate skill tables. Increases to STR, DEX and END represent actual upgrades of manipulators or power sources and can be reflected in the robot's physical construction. Increases to INT or EDU must be within the capabilities – technological, Bandwidth and Slots of the robot's existing brain and possible Bandwidth upgrades – otherwise the skill is lost. Increases to SOC are possible only if the robot is free; in a society where a robot may become 'emancipated' an increase in SOC represents this emancipation and raises the robot's SOC above 0.

Skills rolls represent changes to programming. Subject to Bandwidth limitations, the robot may switch a rolled skill for an existing package or reduce the Bandwidth of an existing skill to allow substitution of a new skill. A robot with no available Bandwidth skill slots can take the skill at level 0. Skills such as Stealth, Navigation, Recon or Vacc Suit might represent upgrades to physical systems if Slots are available to install or upgrade options. A robot cannot receive the Jack-of-all-Trades skill – not even if it has a Conscious brain.

MUSTERING OUT BENEFITS

A robot may roll for Benefits as normal, with the usual limitations to characteristic increases. Results of Armour or Weapons can be assumed to be upgrades or installation of weapon systems if Slots are available. A result of Combat Implant or other augment can be construed as an increase in the capabilities of an installed system.

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CENTRAL SUPPLY CATALOGUE: ROBOTS

Creating, controlling and maintaining robots requires a variety of equipment, from simple hand controllers to full laboratories that would make any roboticist (mad or otherwise) proud.

Avatar Chair: This is a bulky armchair equipped with a large neurosensory helmet that allows a Traveller without implants to control an avatar or drone. On a starship, the chair consumes 0.5 tons, on a vehicle it requires two Spaces. An occupant in the chair experiences full presence when connected to a remote avatar interface with full control of its actions. When connected to a remote drone interface, the occupant has an experience similar to a drone control helmet.

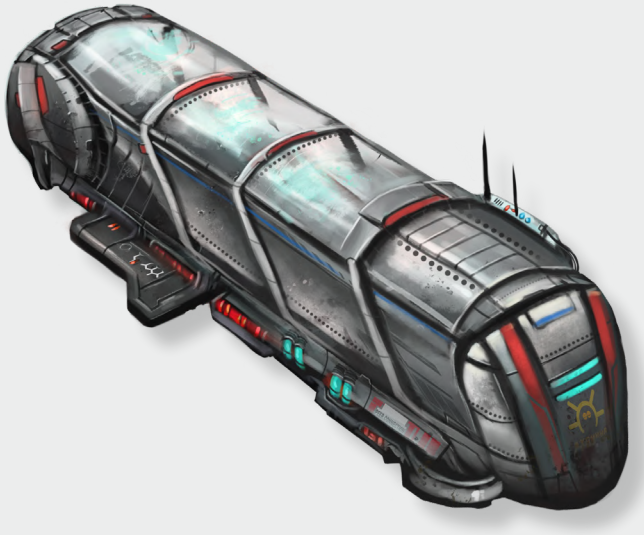
The avatar chair includes a 500-kilometre transceiver, and can connect to an external transceiver for additional range, but beyond 500 kilometres light speed delays become noticeable, disrupting the feeling of 'being' the avatar and imparting DM-1 to checks requiring DEX. Beyond 5,000 kilometres, the avatar 'experience' fails, returning 'consciousness' to occupant of the chair, though drone control is still possible.

The avatar chair comes in two models: standard and deluxe. Both include restraints to prevent the occupant from injuring themselves while connected to the avatar, though voluntary moment is inhibited during the experience. The deluxe version includes medical-grade connections allowing for feeding, waste disposal and muscle conditioning without terminating the avatar link, allowing an experience to last indefinitely.

ITEM	TL	KG	COST
Avatar Chair, Standard	13	200	Cr300000
Avatar Chair, Deluxe	13	200	Cr500000

Clone Tank: A clone tank is a standardised bioreactor intended for growing clones to maturation. A TL9 basic tank is intended for medical clones and can maintain them indefinitely but could be used to grow a clone. Improved and advanced clone tanks support this feature but are most often used for accelerated or quick-grown clones, respectively. A clone tank has no capacity for customising a clone; it must accept a template created elsewhere.

Based on a standard bioreactor, a clone tank is designed to fit into a standard low berth mounting, consuming 0.5 tons or two vehicle Spaces. It has the same volume as a Size 7 robot and the same internal dimensions as a low berth or the equivalent capacity of a 50 Slot bioreaction chamber.



CLONE TANK	TL	DESCRIPTION	COST
Basic	9	Suitable for growth and maintenance medical clones without higher mental functions	Cr100000
Improved	10	Suitable for accelerated 12x growth to adulthood	Cr250000
Advanced	13	Suitable for quick-grown 50x growth to adulthood	MCr1

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Deconstruction Chamber: A deconstruction chamber is in some respects the opposite of an enhanced fabrication chamber. The chamber uses precise measuring devices and nanomachines to dissemble an object and record its composition at the molecular level. This process completely destroys the object but allows for construction of an identical object using an enhanced fabrication chamber. It can be used to 'harvest' memories and personality of a biological or robotic brain but the process is destructive. Enhanced fabricators can put the body back together but cannot restore memories or personalities, although they can be stored in electronic form for restoration onto an agent wafer in the case of a biological brain or a fresh robotic brain in the case of a robot. Output from the deconstruction process of a standard-sized chamber requires Bandwidth 32 to store in computer memory or on data wafers. Available at TL13, the deconstruction chamber is the size of a standard low berth, able to hold an item or person occupying 50 Slots or about 150 kilograms and requires 64 Slots if installed in a robot.

ITEM	TL	KG	COST
Deconstruction Chamber	13	200	MCr5

Smaller or larger deconstruction chambers are available. MCr1 is the cost of its core machinery and the remainder scales linearly, with a half-sized chamber costing MCr3 and a double-sized chamber costing MCr9.

Drone Control Console: A drone control console is an integrated console that allows a Traveller to control a drone. The console allows command of one drone and includes a 50-kilometre transceiver and connections to interface with longer range external transceivers. A video screen allows the operator to see a view from the drone's visual sensors. Beginning at TL8 the improved control console includes audio from any auditory sensors and allows the operator to use the drone's voder if one is present. At TL11 the advanced console allows olfactory sensations to be transmitted, if desired. The operator requires Electronics (remote ops) to effectively use the console. For every 5,000 kilometres distance to the drone, the Control DM decreases by -1.

DRONE CONTROLLER CONSOLE	TL	KG	CONTROL DM	COST
Primitive	5	10	-4	Cr2000
Basic	7	2	-2	Cr2500
Improved	8	2	0	Cr1000
Enhanced	10	0.5	0	Cr1000
Advanced	11	0.5	+1	Cr5000

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Drone Control Helmet: A drone control helmet allows a user without augments to operate a drone by thought. The bulky helmet fits over the head and provides neurological inputs that override a user's senses and movements, receiving senses from the drone and transmitting commands to it. While it provides a virtual reality experience, it does not allow full presence in the sense of an avatar. Effective use of a drone control helmet does not require Electronics (remote ops) skill but benefits from it. The drone control helmet provides all the features of an advanced drone control console, including a 50-kilometre transceiver, and can connect to an external transceiver for additional range. For every 5,000 kilometres distance to the drone, the Control DM decreases by -1.

ITEM	TL	KG	CONTROL DM	COST
Drone Control Helmet	11	3	+1	Cr50000

Inhibitor: An inhibitor is small external device attached to a robot that limits its activities. An inhibitor allows for geofencing – limiting the operating range – of robots and for remote shutdown. Most drone interfaces include inhibitor technology but a drone interface is not necessary for an inhibitor to function. Inhibitors cannot be installed on microbots or nanorobots. An inhibitor includes a 50-kilometre transceiver separate from any installed in the robot. They are generic and can be transferred from robot-to-robot.

The TL13 inhibitor imposes DM-2 on any robot's attempt to override an inhibitor.

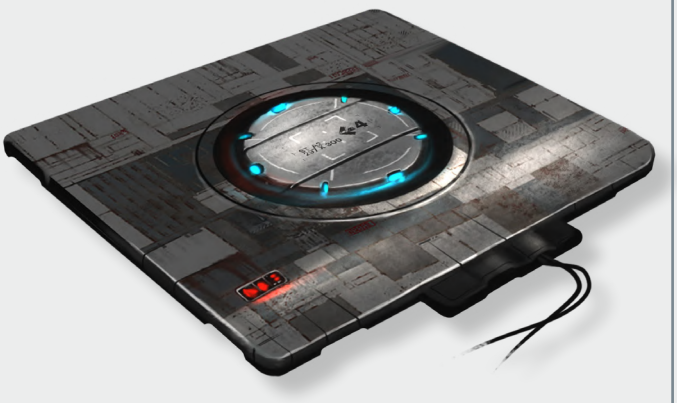
ITEM	TL	KG	COST
Inhibitor, Basic	9	—	Cr500
Inhibitor, Advanced	13	—	Cr500

Induction Plate

Rather than plug into a hard-wired socket, a robot may use an induction plate, standing on or lying in front of it to recharge batteries. This is especially useful for converting biological robots and androids, who can conceal an induction plate in a bed and regain power after a 'natural' night's sleep. An induction plate's size is related to the robot's Base Slots and requires a connection to a source of power, whether the local electric grid or a ship's power systems.

Larger plates may recharge vehicles, with a 64 Slot-equivalent plate required for a vehicle of one Space in size. Public induction plates are also available for recharging, usually at a reasonable fee of Cr2+1 per Slot-equivalent for an eight-hour full recharge. Induction plates may vary the amount of current they deliver but fully recharging a robot with a fast charger in one hour instead of eight usually incurs 10 times the fee of a regular recharge.

ITEM	TL	KG PER SLOT	COST PER SLOT
Induction Plate	8	0.1	Cr20



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Robotics Lab Fabrication Chamber:

Robotics laboratories are often equipped with a 128-Slot fabrication chamber, capable of building a Size 6 robot body, including a power source and material input bins. A smaller 64-Slot fabrication chamber capable of building a Size 5 robot body is also available, as is a 32-Slot Size 4 robot builder, at one half and one quarter the cost, respectively. At TL13 these chambers can also act as bioreactors or clone vats. See the fabrication chamber option on page 51 for limits on the time requirement.

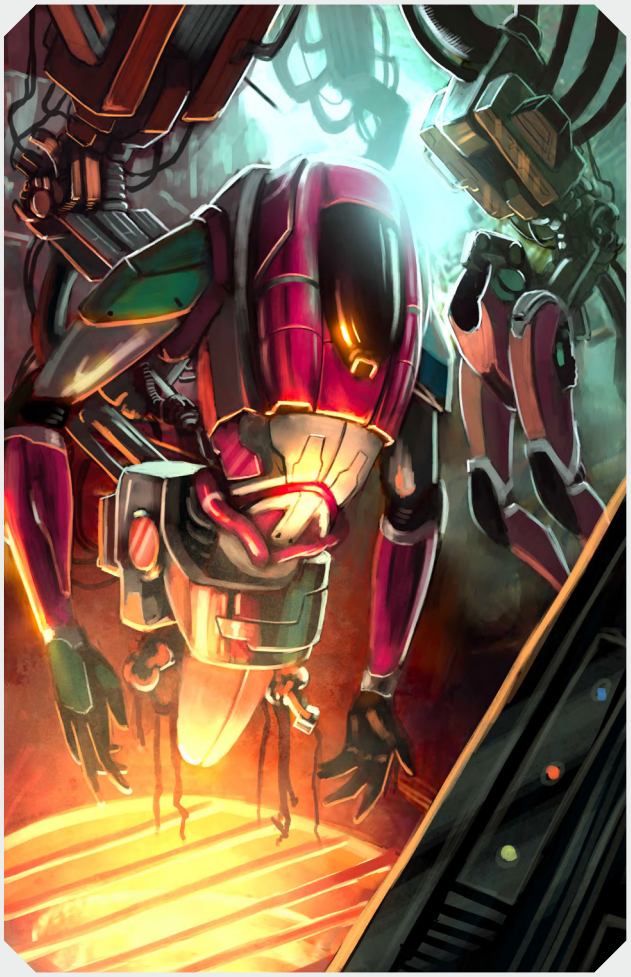
FABRICATION CHAMBER	TL	COMPLEXITY	TIME REQUIREMENT	COST
Basic	8	Mechanical parts only	2 hours	250000
Improved	10	Simple electronics Primitive robot brain	2 hours	MCr1.25
Enhanced	13	Complex electronics, simple biomechanical Basic robot brain	1 hour	MCr6
Advanced	17	Complex biomechanical Any robot brain	1 hour	MCr24

Robotics Laboratory

Robots can be built and maintained in a robotics laboratory. In the context of a spacecraft, this is a four-ton laboratory option or, if transported in a cargo bay, it takes five tons of hold space. On a vehicle it is a 16-Space customisation. The shell's standard equipment includes a workbench large enough for a Size 6 robot and toolkits for mechanical, electronic and robotics work.

Optional equipment includes fabricators and controllers. In addition to the workbench and toolkits, the laboratory has room to install a 128-Slot fabrication chamber, one avatar chair and various controllers. Robotic avatar, drone and swarm controllers require a robotic brain for operation, such as the immobile lab control robot (page 179). A drone control interface for a biological operator can be included in the laboratory at the costs listed on page 79.

LABORATORY SHELL	SIZE	COST
Spacecraft	4 tons	Cr500000
Vehicle	16 Spaces	Cr50000
Pressurised (base)	5 tons as cargo, 3m x 3m x 6m	Cr125000
Unpressurised (building)	5 tons as cargo, 3m x 3m x 6m	Cr25000



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Swarm Controller Console

A swarm controller console is an integrated console that enables a Traveller to command a swarm of robots. While swarms are normally microbots or nanorobots, nothing prevents the swarm controller from commanding a group of identical larger robots conducting synchronised tasks from construction to mining to storming a fortress – although as a mob, not a coordinated military force.

The console includes a computer specialised to run Swarm Control software through an Expert system, allowing an unskilled individual to verbally control the console to issue commands for the swarm to conduct tasks. A multi-channel wireless data link and 50-kilometre multi-channel transceiver is integrated.

The console can also be operated as an improved drone control interface with an effective Electronics (remote ops) 0 for an unskilled individual or at full skill level for an expert drone operator. Control of swarms is limited to the 50-metre range of the wireless data link but drones can be controlled up to 50 kilometres distance. External multichannel transceivers to extend this distance are available at 10 times the cost of a standard transceiver of equivalent range.

More advanced swarm controllers are available at higher Tech Levels as computers and software improve. Skill limitations on task complexity are equivalent to that described for the robotic swarm controller on page 45.

SWARM CONTROLLER CONSOLE	TL	CAPABILITY	KG	COST
Basic	11	1 max tasks, 0 max skill or 1 drone	10	Cr20000
Improved	12	2 max tasks, 1 max skill or 2 drones	6	Cr50000
Enhanced	13	3 max tasks, 2 max skill or 4 drones	4	Cr100000
Advanced	14	4 max tasks, 3 max skill or 8 drones	2	Cr200000

SOFTWARE

Robots run on software but those who work with robots require software to design and control them.

Clone Creator

This is software for developing custom clone genetic sequences. Increasing complexity of genetic modification is matched by increasingly complex software, although earlier versions can create simpler clones. Clone Creator software provides a DM equal to its Bandwidth on any tasks to create novel genetic designs.

SOFTWARE	BANDWIDTH	TL	CAPABILITY	COST
Clone Creator/1	1	8	Modify DNA to prep for basic cloning	Cr2000
Clone Creator/2	2	10	Create novel organisms from a natural template	Cr20000
Clone Creator/3	3	13	Create organisms to specifications from scratch	Cr200000

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Drone Control

Drone Control software is Expert software requiring an Intelligent Interface, which can be run on a computer attached to a robotic drone controller or connected to a robot via transceiver link. This software is only capable of controlling a single drone at a time.

SOFTWARE	BANDWIDTH	TL	CONTROL DM	COST
Drone Control/1	1	11	+0	Cr2000
Drone Control/2	2	12	+1	Cr5000

Fab Creator

Fab Creator is software for developing custom fabrication designs. Increasing complexity of fabrication output is matched by increasingly complex software, although earlier versions can create simpler patterns for printing on more sophisticated fabricators. Fab Creator software provides a DM equal to its Bandwidth on any tasks to create novel fabricator designs. Fab Creator/3 and /4 can design or modify nanorobots.

SOFTWARE	Bandwidth	TL	CAPABILITY	COST
Fab Creator/1	1	8	Basic Fabricator output	Cr2000
Fab Creator/2	2	10	Improved Fabricator output	Cr5000
Fab Creator/3	3	13	Enhanced Fabricator output	Cr20000
Fab Creator/4	4	17	Advanced Fabricator output	Cr50000

Swarm Control

Swarm Control software is Expert software requiring an Intelligent Interface that can be run on a computer attached to a swarm controller (see page 45) or connected to a group of robots via a high-speed multi-channel wireless data link available for Cr500. It allows a Traveller to control a group of robots in a manner similar to a swarm controller console.

SOFTWARE	BANDWIDTH	TL	CAPABILITY	COST
Swarm Control/1	1	11	1 max tasks, 0 max skill	Cr15000
Swarm Control/2	2	12	2 max tasks, 1 max skill	Cr30000
Swarm Control/3	3	13	3 max tasks, 2 max skill	Cr60000
Swarm Control/4	4	14	4 max tasks, 3 max skill	Cr120000

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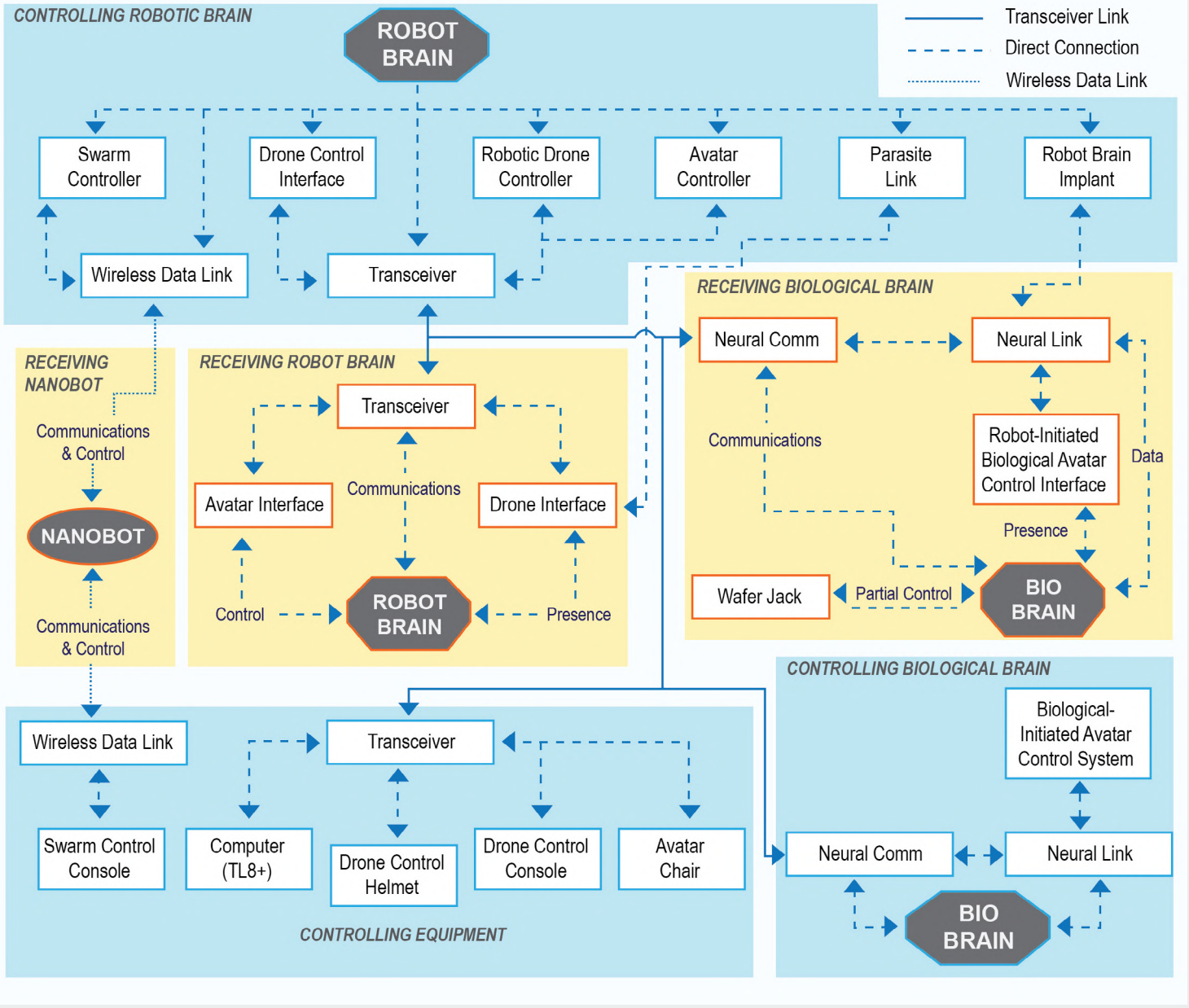
ROBOTICS CONTROL CHART

Robots are self-sufficient machines, capable of independent operation. However, robots, drones and even biological beings can be remotely controlled by other robots, biological beings and equipment. The Robotics Control Chart summarises the methods and equipment needed for these control pathways.

FINAL NOTE

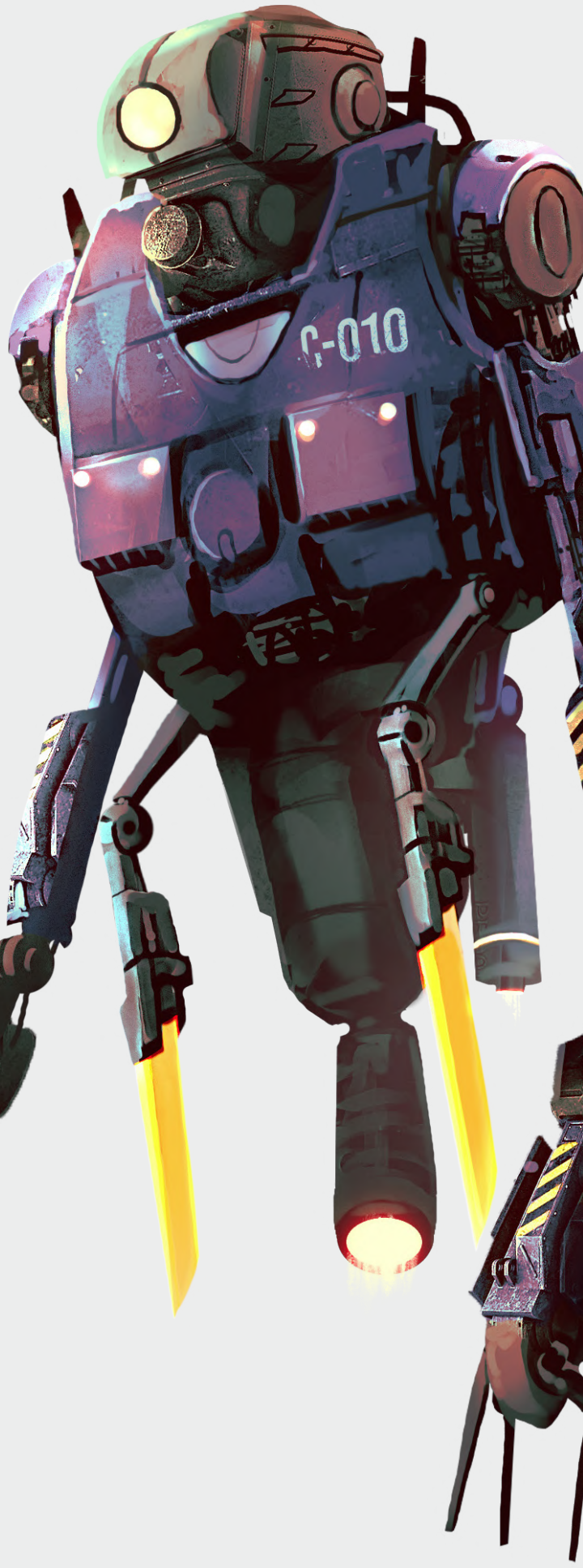
These rules are intended for the creation of robots but are also useful as a 'Thing-Maker', allowing creation of many custom devices. A 'Thing' can begin as a robot with no locomotion and no manipulators, adding a few extra Slots to the shell of a device. The rules assume a basic power supply but the 'No Internal Power' option can remove it. The Thing can then include any options required to meet its requirements, perhaps with a standard computer added as a brain, if necessary.

Robotics Control Chart



Conny Delshagen (Order #4256282)

THE ROBOT CATALOGUE



Robots serve a variety of purposes from the mundane to the specialised, from healthcare to military and everything in between. This chapter details robots available across varying levels of technology and sophistication, from simple cleaning machines to the most advanced artificial sentient beings. Most robots or their equivalent are available in any universe but some, specifically those produced by alien races, are based on the Charted Space universe.

More than 40 of these robots are derived from the *Central Supply Catalogue* and various supplements and adventures. As they were designed prior to the release of the *Robot Handbook*, the following specifications may vary from the previous versions of these robots in some respects. Every effort was made to conform to the capabilities of the original robot but to be consistent with the design framework some features may have changed and more detailed options added. In most cases the major difference is the cost of the robot, which is almost universally less than the price listed in previous publications.

Conny Dalshagen (Order #4256827)

Military Robots

Military robots perform functions including direct combat, surveillance and support roles. Many societies, including the Third Imperium, place strong restrictions on the capabilities of military robots, often relegating them to non-combat roles. Within such societies lethal robots are generally illegal to produce, possess and, certainly, to use. Other societies see a military robot as just another tool of war.

Battle Mule

Battle Mule is one of several supply-and-reloading drones on the market. It takes the form of a low, lightly armoured box with six large balloon tyres similar to those of an all-terrain vehicle. It can cross calm water without preparation, using its tyres for buoyancy, and is agile enough to deal with rough terrain. Battle Mule has two internal compartments; the larger one is purely cargo stowage and can carry 50 kilograms of ammunition or various supplies. The smaller can be configured for cargo by removing the automatic reloading equipment but is more commonly used as a field loader in direct support of a unit. The auto-reloader carries 1,000–2,000 rounds of ammunition, depending on calibre, in its ready hopper. It can reload standard magazines for up to three different weapons or ammunition types at once. Actual reloading takes one combat round but inserting an empty magazine or taking a full one out is a Minor Action for the soldier. The ammunition hopper can be reloaded using pre-packaged or loose ammunition. A box of 1,000 rounds typically weighs about 10 kilograms.

Battle Mule can be used to conduct semi-autonomous resupply operations to forward positions or troops on the move or can accompany a force in the field. It is a large target and despite programming to use terrain as cover, Battle Mules tend to be put out of action on a frequent basis. A variant has recently reached the marketplace that trades cargo and reloading areas for a very cramped operator station. The operator kneels with their legs inside the cargo space and most of their torso sticking out. A raised, folding shield is fitted to the front and sides, which can be swung out to provide mobile cover for two soldiers on each side. Some units have attempted to fit a light support weapon for the operator to use but this has achieved little success. Despite looking ridiculous, the shielded variant can provide cover during an advance and has seen success with some starport security formations. The shield adds Protection +8 against attacks from the side it is facing.

Robot	Hits	Locomotion	Speed	TL	Cost
Battle Mule	55	Wheels, ATV	—	9	Cr40000
Skills	Athletics (dexterity) 1, Athletics (endurance) 3, Stealth 2				
Attacks	—				
Manipulators	—				
Endurance	432 (108) hours				
Traits	Armour (+12), ATV (slow), Large (+2)				
Programming	Primitive (evade) (INT 1)				
Options	Auditory Sensor, Drone Interface, Storage Compartment (25 Slots), Transceiver 50km (improved), Visual Spectrum Sensor, Voder Speaker, Weapon Mount Autoloader (medium) x3, Wireless Data Link				

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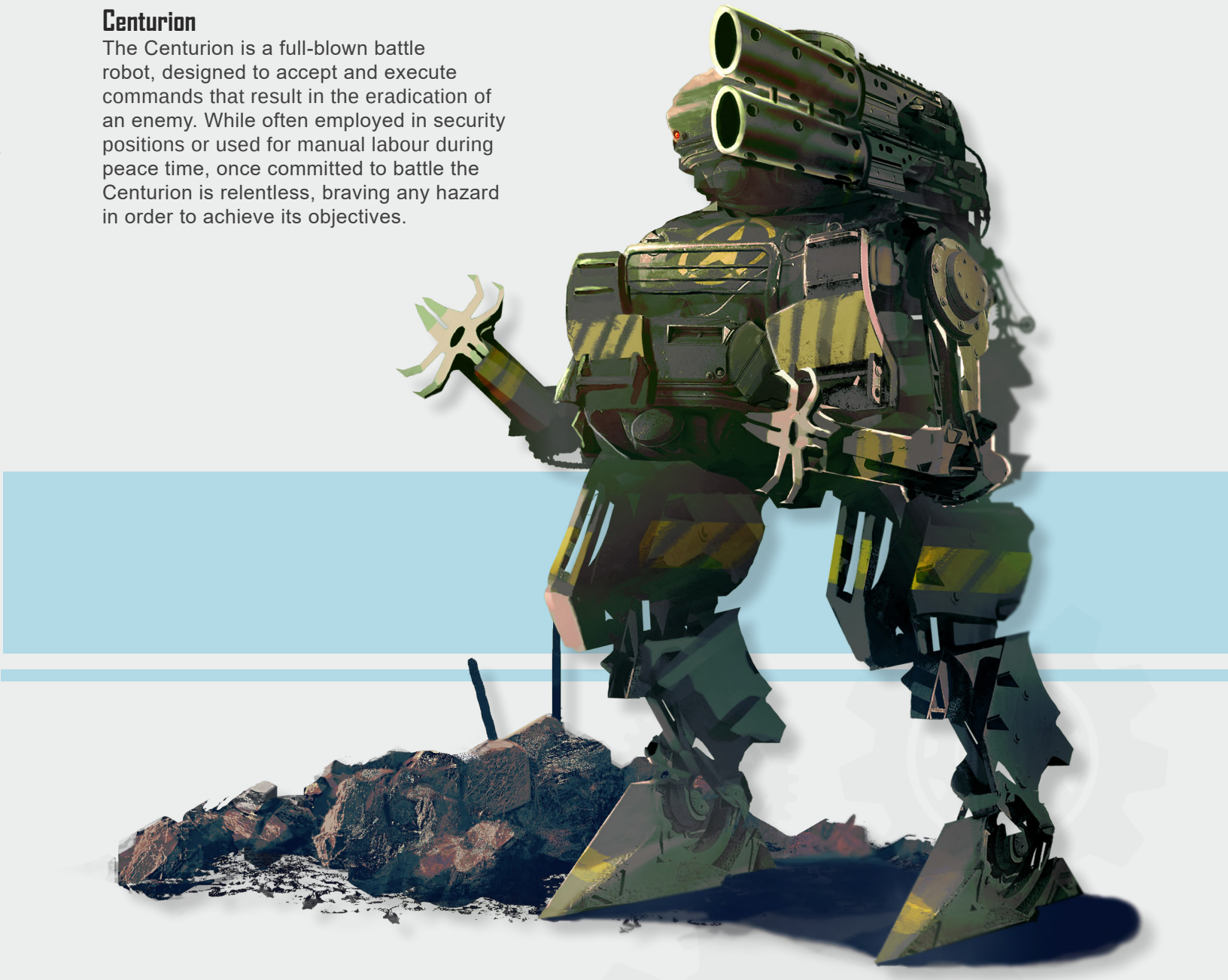
Centurion

The Centurion is a full-blown battle robot, designed to accept and execute commands that result in the eradication of an enemy. While often employed in security positions or used for manual labour during peace time, once committed to battle the Centurion is relentless, braving any hazard in order to achieve its objectives.



Robot	Hits	Locomotion	Speed	TL	Cost
Centurion	32	Walker	7m	12	Cr200000
Skills	Athletics (endurance) 2, Explosives 1, Gun Combat (slug) 3, Melee (unarmed) 2, Recon 3, Tactics (military) 3				
Attacks	Gauss Rifles x2 (linked: 4D+4, AP 5, Auto 3, Scope), 880 shots				
Manipulators	2x (STR 11 DEX 7)				
Endurance	259 hours				
Traits	Armour (+14), ATV, Large (+1)				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Construction Equipment (medium), Drone Interface, Fire Control System (enhanced), Olfactory Sensor (basic), Radiation Environment Protection (+600 rads), Recon Sensor (advanced), Satellite Uplink, Transceiver 500km (enhanced), Vacuum Environment Protection, Visual Spectrum Sensor, Voder Speaker, Weapon Mounts (medium) x2, Weapon Mount Autoloaders x2, Wireless Data Link				

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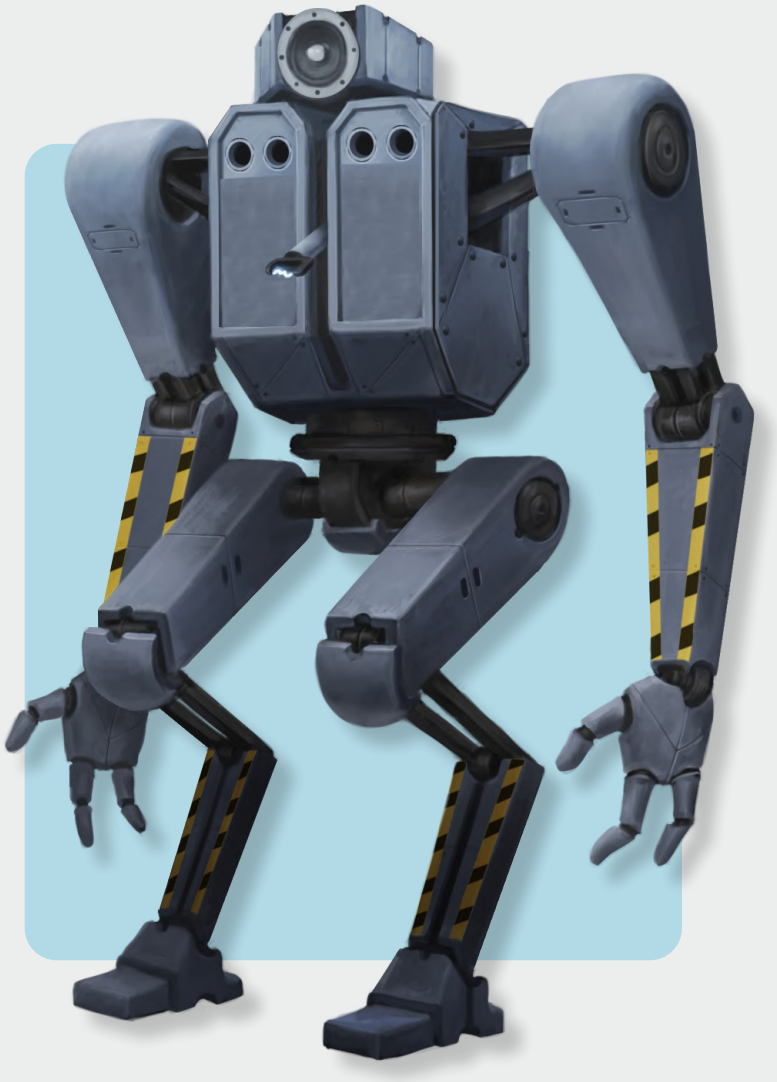
Clearance 600 Crowd Dispersal Unit

The Clearance 600 is designed to look impenetrable and, for its role, it is effectively so. A squat humanoid robot two metres tall with a blunt head equipped with loudspeaker mouth and a stunner on the chin, the heavily armoured Clearance 600 has a chest-mounted grenade launcher normally equipped with non-lethal rounds and oversized arms capable of forcing their way through crowds or pommelling resisters senseless.

Its main drawback is relatively slow mobility, although some would say this is a feature, encouraging a crowd to disperse by fleeing. In any case, those brought down by stunner or disabling grenades can be picked up at leisure and kept under control by a large collection of restraints carried in a small internal compartment.

Another flaw is its fire control system limitation of initiating only one attack at a time. The robot can fire the grenade launcher or stunner or engage in hand-to-hand combat, yet is unable to make multiple attacks or deal well with multiple foes. Despite this, some purchasers have equipped the Clearance 600 with lethal grenades and used it for close combat operations. Although the robot is a tough target, it is large and slow, making it more suitable for operations against lightly armed opponents in open terrain.



Robot	Hits	Locomotion	Speed	TL	Cost
Clearance 600 Crowd Dispersal Unit	40	Walker	5m	10	Cr83000
Skills	Gun Combat (energy) 1, Heavy Weapons (portable) 1, Melee (bludgeon) 1, Recon 2, Tactics (military) 2				
Attacks	Fists (3D), Grenade Launcher (varies), Stunner TL10 (2D+3, Stun, Zero-G)				
Manipulators	2x (STR 15 DEX 6)				
Endurance	72 hours				
Traits	Armour (+19), ATV, Heightened Senses, IR Vision, Large (+1)				
Programming	Hunter/Killer (tactical) (INT 4)				
Options	Auditory Sensor (broad spectrum), Drone Interface, Fire Control System (basic), Laser Designator, Light Intensifier Sensor (advanced), Recon Sensor (enhanced), Storage Compartment (1 Slot), Transceiver 50km (improved), Visual Spectrum Sensor, Voder Speaker (broad spectrum), Weapon Mount (medium), Weapon Mount (small), Weapon Mount Autoloader (medium), Wireless Data Link				

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Combat Drone

The GeDeCo Combat Drone is a security robot designed to provide defence for high-value installations. Armed with a laser rifle, these flying drones are tasked with driving intruders from a facility with lethal force and alerting coordinated defence assets to provide a proportionate response. Additional Slots allow customisation to specific duties but the general-purpose base model can repel anything short of a military assault.

Robot	Hits	Locomotion	Speed	TL	Cost
Combat Drone	22	Grav	8m	11	Cr78000
Skills	Gun Combat (energy) 2, Tactics (military) 1				
Attacks	Laser Rifle (5D+3, Zero-G)				
Manipulators	2x (STR 9 DEX 7)				
Endurance	19 hours				
Traits	Alarm, Armour (+8), Flyer (idle), IR Vision				
Programming	Basic (security) (INT 4)				
Options	Auditory Sensor, Drone Interface, Fire Control System (improved), Light Intensifier Sensor (advanced), Spare Slots x8, Transceiver 50km (enhanced), Vacuum Environment Protection, Voder Speaker, Weapon Mount (medium), Wireless Data Link				

Creeper Assassin

This tiny robot has a single purpose and is usually considered disposable after – to gain access to a target and deliver a lethal attack. Small enough to be held in the palm, a creeper assassin can vary in appearance, with some slug-like while others are more like metallic spiders. However, all have deadly purpose once programmed to kill a specific target. Although its standard monoblade is perfectly lethal, particularly against targets not expecting an attack, especially vindictive users may also coat the weapon with poison.

Robot	Hits	Locomotion	Speed	TL	Cost
Creeper Assassin	4	Walker	6m	12	Cr190000
Skills	Athletics (dexterity) 3, Electronics (computers) 1, Investigate 2, Melee (blade) 3, Navigation 1, Recon 3				
Attacks	Monoblade (3D, AP 10)				
Manipulators	—				
Endurance	130 hours				
Traits	Armour (+6), ATV, Heightened Senses, IR/UV Vision, Small (-3)				
Programming	Advanced (INT 9)				
Options	Auditory Sensor, Drone Interface, Environment Processor, Gecko Grippers, PRIS Sensor, Recon Sensor (advanced), Transceiver 5km (improved), Voder Speaker, Weapon Mount (small), Wireless Data Link				

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DesiGnator

DesiGnator is a grav-mobile drone about the size of a tennis ball, equipped with a laser designator/rangefinder and a battery of thermal and optical cameras. Range is about 15 kilometres, assuming the operator wants the drone to be able to return to its launch point for recovery and recharging. DesiGnator does not move much faster than a jogging human but is a difficult target. Its name is derived from 'gravitic propelled designation drone' but DesiGnators are more commonly used for reconnaissance.

Fighting Strongpoint

The Fighting Strongpoint is an armed version of the Walking Strongpoint (see page 144), replacing the large storage compartment with a dual laser rifle mount and expanded power pack capacity. In addition to all the features and limitations of the Walking Strongpoint, the Fighting Strongpoint's linked lasers can fire in a 90° arc centred on the forward face of the shield-like robot while still providing cover and firing slits for up to four soldiers and spare ammunition for their weapons. Another compartment below the lasers contains space for optional components but does not allow for more armour or other full-chassis options.

As a lethal combat robot, the Fighting Strongpoint is sometimes sold with the mounting for dual lasers but no weapons installed. It can deal a great amount of damage to even moderately armoured vehicles but does not sport a top-of-the-line fire control system, although an upgrade is possible for an additional Cr25000.

Robot	Hits	Locomotion	Speed	TL	Cost
DesiGnator	5	Grav	9m	10	Cr20000
Skills	Athletics (dexterity) 1, Recon 2				
Attacks	-—				
Manipulators	—				
Endurance	19 hours				
Traits	Armour (+3), Flyer (idle), IR Vision, Small (-3)				
Programming	Primitive (alert) (INT 1)				
Options	Drone Interface, Laser Designator, Light Intensifier Sensor (advanced), Recon Sensor (enhanced), Transceiver 50km (improved), Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Fighting Strongpoint	32	Walker	6m	11	Cr330000
Skills	Gun Combat (energy) 2, Recon 2, Stealth 3, Tactics (military) 1				
Attacks	Laser Rifles x2 (linked: 5D+8, Zero-G) 1,100 shots				
Manipulators	—				
Endurance	65 hours				
Traits	Alarm, Armour (+19), ATV, IR Vision, Large (+1)				
Programming	Basic (security) (INT 4)				
Options	Auditory Sensor, Camouflage: Visual (enhanced), Construction Equipment (medium), Drone Interface, Encryption Module, Fire Control System (improved), Light Intensifier Sensor (advanced), Radiation Environment Protection (+550 rads), Recon Sensor (enhanced), Satellite Uplink, Self-Repairing Chassis, Spare Slot, Transceiver 500km (enhanced), Vacuum Environment Protection, Voder Speaker, Weapon Mounts (medium) x2, Weapon Mount Autoloaders (medium) x6, Wireless Data Link				

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Floating Strongpoint

A technological improvement of the Walking Strongpoint (see page 144), the floating strongpoint is shaped like a broad shield floating just above the ground. It provides cover for an advancing fire team over any terrain, overcoming one of its walking predecessor's weaknesses. Its camouflaged and armoured body hinges out three to six metres wide when fully extended and provides cover and firing slits for four soldiers. Four medium-sized small arms bins hold up 10 extra magazines each and one large bin can support a large portable weapon's reloads. The robot is equipped with integral entrenching tools to help dig foxholes and trenches for additional protection but its lack of manipulators prevents it from using detached tools.

The unarmed strongpoint is equipped with upgraded sensors and communications links and can stand guard while its troops rest. The robot can operate in vacuum and is well protected against radiation. It cannot help its troops breathe but can act as a cover from radiation, providing a directional 225 rads protection while deployed and up to its full 1,100 rads protection if used as a shield above a foxhole with its firing slits closed.

Flying Gun (small)

The ultimate in 'smart gun' technology is a robotic grav-propelled gun with an Advanced robot brain. Designed to back up boarding crews or police officers, it has also found use as an assassination tool. Based on the receiver of a personal defence laser, the small flying gun has no grip or any accommodation for a biological user. It is an armoured laser barrel with extra power packs capable of quickly moving across a conflict zone and providing automatic fire at short range.

Robot	Hits	Locomotion	Speed	TL	Cost
Floating Strongpoint	32	Grav	6m	12	Cr220000
Skills	Melee (bludgeon) 1, Recon 3, Stealth 4, Tactics (military) 1				
Attacks	Crush (3D)				
Manipulators	—				
Endurance	72 hours				
Traits	Alarm, Armour (+28), Flyer (idle), Heightened Senses, IR/UV Vision, Large (+1)				
Programming	Basic (security) (INT 4)				
Options	Auditory Sensor (broad spectrum), Camouflage: Visual (advanced), Construction Equipment (medium), Drone Interface, Encryption Module, PRIS Sensor, Radiation Environment Protection (+600 rads), Recon Sensor (advanced), Satellite Uplink, Self-Repairing Chassis, Vacuum Environment Protection, Transceiver 5,000km (enhanced), Voder Speaker, Weapon Mount Autoloader (heavy), Weapon Mount Autoloaders (medium) x4, Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Flying Gun, Small	4	Grav	12m	13	Cr87000
Skills	Athletics (dexterity) 1, Gun Combat (energy) 2, Recon 2, Tactics (military) 3				
Attacks	Personal Defence Laser (3D+3, Auto 2, Zero-G) 525 shots				
Manipulators	—				
Endurance	18 hours				
Traits	Armour (+7, +10 vs. lasers), Flyer (idle), Heightened Senses, IR/UV Vision, Small (-3)				
Programming	Advanced (INT 9)				
Options	Auditory Sensor (broad spectrum), Drone Interface, PRIS Sensor, Reflec Armour, Transceiver 50km (advanced), Vacuum Environment Protection, Voder Speaker, Weapon Mount (small), Weapon Mount Autoloader (small), Wireless Data Link				

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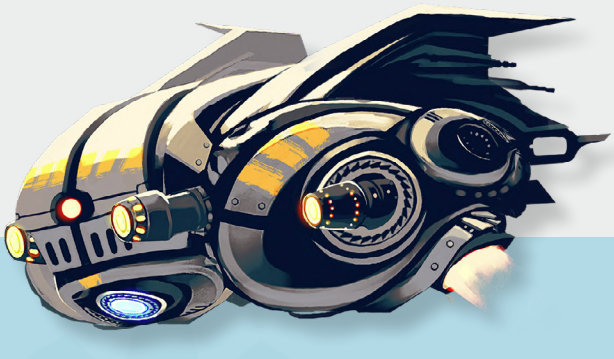
Flying Gun (medium)

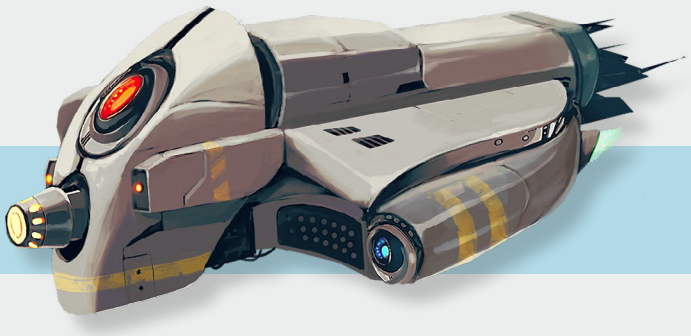
The medium flying gun is a grav-propelled stagger laser rifle with extra power packs to allow 2,100 shots. Small and fast, it is an automated support weapon with enough intelligence to operate independently or as part of a fire team. In the field, its major drawback besides cost is its small size and light armour. While difficult to hit by direct fire, it is susceptible to blast damage from artillery. The shiny reflec-coated flying gun does have significant deterrence value – if one suddenly appears behind lines politely asking for troops to surrender, compliance often follows.



Robot	Hits	Locomotion	Speed	TL	Cost
Flying Gun, Medium	8	Grav	12m	14	Cr220000
Skills	Athletics (dexterity) 1, Gun Combat (energy) 2, Recon 2, Tactics (military) 3				
Attacks	Stagger Laser Rifle (5D+3, Auto 3, Zero-G) 2,100 shots				
Manipulators	—				
Endurance	18 hours				
Traits	Armour (+7, +10 vs. lasers), Flyer (idle), Heightened Senses, IR/UV Vision, Small (-2)				
Programming	Advanced (INT 9)				
Options	Auditory Sensor (broad spectrum), Drone Interface, PRIS Sensor, Reflec Armour, Transceiver 50km (advanced), Vacuum Environment Protection, Voder Speaker, Weapon Mount (medium), Weapon Mount Autoloader (medium), Wireless Data Link				

Flying Gun (large)

Using the same brain as its smaller cousins, the large flying gun is built around a portable fusion gun, capable of doing vast amounts of damage. Forgoing the shiny reflec coating for heavy armour, a superior visilight camouflage coating and sound-dampened grav units, the large flying fusion gun can remain well hidden until it fires. As miniaturisation and recoil were not primary considerations, the human-sized gun platform is surprisingly affordable at Cr280000 but the availability of its radiation spewing fusion gun is strictly limited. Forgoing the Cr100000 fusion gun, versions equipped with slightly less restricted plasma weapons are also available. The lack of an autoloader limits the platform's usability with projectile-firing weapon alternatives.



Robot	Hits	Locomotion	Speed	TL	Cost
Flying Gun, Large	20	Grav	12m	14	Cr290000
Skills	Athletics (dexterity) 1, Gun Combat (energy) 2, Recon 2, Stealth 4, Tactics (military) 3				
Attacks	Fusion Gun Human Portable (2DD, Very Bulky, Radiation) unlimited shots				
Manipulators	—				
Endurance	18 hours				
Traits	Armour (+28), Flyer (idle), Heightened Senses, IR/UV Vision				
Programming	Advanced (INT 9)				
Options	Auditory Sensor (broad spectrum), Camouflage: Audible (advanced), Camouflage: Visual (superior), Drone Interface, PRIS Sensor, Radiation Environment Protection (+700 rads), Transceiver 50 km (advanced), Vacuum Environment Protection, Voder Speaker, Weapon Mount (heavy), Wireless Data Link				

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Flying Sword

The Flying Sword is simply a grav-propelled static blade with a Hunter-Killer brain. With its robotic 'guts' embedded in the hilt, the Flying Sword can be used as a hand-held weapon but is fully able to autonomously fight a designated target and pursue with great speed and agility, using cunning and sword-fighting techniques to strike down prey. Whether let loose in the heat of battle or released from afar to hunt its target, the flying sword is a lethal weapon that sometimes sneaks through the legal and customs cracks on worlds that prohibit firearms but remain tolerant of 'weapons of honour'. Equipped with a reflec and armour-coated surface, it can 'parry' or absorb damage but a direct penetrating hit knocks it down.

Grav Mule

Grav Mule is an enlarged and grav-mobile version of the Battle Mule drone intended for resupply and casualty evacuation missions. When configured for resupply operations the unit can carry more than 200 kilograms of supplies, with one or more field reloading kits slotted into place. Equipment bays along the sides allow quick deployment of necessary items or can carry additional systems such as sensor jammers, decoy launchers and the like. Using high-speed nap-of-earth flight, the Grav Mule can get supplies to a surrounded unit under conditions where a crewed vehicle would face too much risk.

Alternatively, the drone can be set up for casualty evacuation. A pair of slide-out stretchers are always fitted and a life support pack for each can be quickly installed. Once in place, two casualties can be slid into a Grav Mule's armoured box and transported – safely but claustrophobically – to the rear for treatment.

Robot	Hits	Locomotion	Speed	TL	Cost
Flying Sword	1	Grav	12m	12	Cr53000
Skills	Athletics (dexterity) 2, Melee (blade) 2, Recon 0, Tactics (military) 2				
Attacks	Static Blade (3D+2, AP 6)				
Manipulators	—				
Endurance	22 hours				
Traits	Armour (+7, +10 vs. lasers), Flyer (idle), Heightened Senses, IR/UV Vision, Small (-4)				
Programming	Hunter/Killer (tactical) (INT 4)				
Options	Auditory Sensor (broad spectrum), Drone Interface, Fire Control System (improved), PRIS Sensor, Reflec Armour, Transceiver 50km (enhanced), Vacuum Environment Protection, Voder Speaker, Weapon Mount (small), Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Grav Mule Drone	72	Grav	-—	10	Cr300000
Skills	Athletics (dexterity) 1, Stealth 2				
Attacks	—				
Manipulators	—				
Endurance	24 (6) hours				
Traits	Armour (+16), Flyer (high), Large (+3)				
Programming	Primitive (evade) (INT 1)				
Options	Auditory Sensor, Drone Interface, Storage Compartment (107 Slots), Transceiver 500km (improved), Visual Spectrum Sensor, Voder Speaker, Weapon Mount Autoloaders (medium) x3, Wireless Data Link				

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Grav Pioneer

Grav Pioneer is an obstacle-clearance drone taking the form of a one-metre radius disc using grav propulsion that eats power, requiring recharging every six hours of use. The primary function of Grav Pioneer is to clear mines and improvised explosive devices. It carries an array of sensors for the purpose and can detonate mines with a specialised weapon located in a turret on the underside of the disc. The usual projectile is a heavy penetrator or small explosive charge, although a multiple projectile round is available. Grav Pioneer is not programmed to fire on personnel but can be tricked by a skilled operator or hacked and reprogrammed. Some units use Pioneers as security bots in this manner but unfortunate incidents do occur as a result of incomplete or buggy coding. If firing on personnel, the weapon is treated as a heavy smoothbore firing pellet ammunition, which was developed for the safe destruction of explosive devices.

Its grav drive is programmed to 'make the drone light' in the event of a pressure wave such as that caused by an exploding mine. This means the drone is more likely to be tossed about than damaged and takes half damage from Blast weapons. A pair of retractable arms, one ending in powerful cutters, allows the clearance of wire and similar light obstacles. Heavier obstructions can sometimes be reduced by firing the drone's explosive ammunition into them in the hope of shaking the obstacle apart.

Robot	Hits	Locomotion	Speed	TL	Cost
Grav Pioneer	20	Grav	—	10	Cr100000
Skills	Athletics (dexterity) 2, Gun Combat 0, Melee 0, Recon 2				
Attacks	Cutting Tool (2D), Explosive Projectiles (as grenade)				
Manipulators	2x (STR 9 DEX 6)				
Endurance	24 (6) hours				
Traits	Armour (+8), Flyer (high), Heightened Senses, IR Vision				
Programming	Basic (recon) (INT 4)				
Options	Auditory Sensor (broad spectrum), Drone Interface, Environment Processor, Light Intensifier Sensor (advanced), Recon Sensor (enhanced), Transceiver 500km (improved), Visual Spectrum Sensor, Voder Speaker, Weapon Mount (medium), Weapon Mount (small), Weapon Mount Autoloader (medium), Wireless Data Link, Spare Slots x3				

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Keshean Gaa – Type 21 Ordnance Handling Robot

The Type 21 is semi-officially designated Keshean Gaa, from a Vilani phrase for someone who always gets the heaviest load or most difficult job. It takes the form of a six-wheeled trolley with a central cradle, surrounded by manipulator arms. The cradle is long enough to accommodate a standard missile or torpedo and self-adjusts to hold configurations firmly in place. Wheeled rather than gravitic drive was chosen to reduce the chance of drift as the unit aligns itself with missile hoists and loading rams, although there is a persistent rumour that the original 'floater' design simply made crews uneasy as it zipped about with a ship-killing missile aboard.

Ordnance handling bots are used to move missiles from hoists to loading rams, ready for launch. They can also be used to move missiles around the ship, from one magazine to another. When in the cradle, the bot's systems will check the arming pin slots and if empty the bot inserts its own pins – a missile carried by a properly functioning handler bot is inert and simply cannot detonate or fire its drive. Neither can the bot move with a live missile in place – if a pin is somehow removed, the bot locks its drive and calls for crew assistance.

The cradle is designed to hold missiles but can reconfigure itself to accommodate a range of other ordnance. Anything from small arms to artillery shells can be carried aboard these units, although inefficiently in this role.

Robot	Hits	Locomotion	Speed	TL	Cost
Keshean Gaa	52	Wheels	3m	13	Cr21000
Skills	Mechanic 0				
Attacks	—				
Manipulators	4x (STR 13 DEX 8)				
Endurance	130 hours				
Traits	Armour (+4), Large (+2)				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Storage Compartment (48 Slots), Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Long Duration Security Robot

The Long Duration Security Robot is a basic design for autonomous operation at remote locations with limited facilities. Equipped with an RTG power source, it can maintain its patrol for decades without replacement or relief, while self-maintenance features allow it to operate until its power source runs low. Equipped with a submachinegun for close assault and three bins for autopistol compatible ammunition, it patrols a designated perimeter on fast wheels and defends its position with lethal force, although those who flee are not pursued beyond the perimeter. With its power source accounting for the majority of its cost, these robots are not generally encountered in civilised settings but often found defending mining claims and supply depots on desolate planets across Charted Space.

Robot	Hits	Locomotion	Speed	TL	Cost
Security Robot	14	Wheels	12m	11	Cr560000
Skills	Gun Combat (slug), Recon 1, Tactics (military) 1				
Attacks	Submachinegun (3D, Auto 3) 620 rounds				
Manipulators	—				
Endurance	25-year half-life RTG (22 hours)				
Traits	Alarm, Armour (+3), IR Vision, Small (-1)				
Programming	Basic (security) (INT 4)				
Options	Auditory Sensor, Drone Interface, Recon Sensor (improved), RTG Long Duration (basic), Self Maintenance Enhancement (improved), Thermal Sensor, Transceiver 500km (enhanced), Voder Speaker, Weapon Mount (medium), Weapon Mount Auto Loaders (small) x3, Wireless Data Link				

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Naasirka Model 899
Security Support Robot

The Imperium is firmly opposed to the use of 'warbots' and autonomous armed systems in general. However, a need was perceived for a robotic platform to support defensive operations and boarding parties; the Model 899 was the result. Examples are available for sale to private operators, who can demonstrate suitable need and accountability, but by far the largest buyer is the Imperial Navy.

A Model 899 is a gravitic-supported robot taking the form of an upright cylinder with rounded ends and a central bulge. This contains a pair of manipulator arms, fire extinguisher and cutting torch capable of making a path through a shipboard bulkhead or even a lightly armoured hull, although not quickly. The robot is most commonly used as a fetch-and-carry device for security patrols and boarding parties, carrying heavy items of equipment or the infamous 'contraband bag'.

Far more Model 899s have seen action during firefighting and rescue operations than in shipboard gunfights but, when necessary, the robot can unfurl its casing panels above and below the central bulge, creating an instant position of cover, which can be advanced or cover a retreat. The top and bottom of the cylinder contain basic sensors and cargo space, which is typically used to carry ammunition and emergency supplies for the security party.

Robot	Hits	Locomotion	Speed	TL	Cost
Naasirka Model 899	36	Grav	5m	13	Cr60000
Skills	Mechanic 0				
Attacks	—				
Manipulators	2x (STR 11 DEX 8)				
Endurance	40 hours				
Traits	Armour (+6), Flyer (idle), Large (+1)				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Cutting torch (improved), Drone Interface, Fire Extinguisher, Storage Compartment (24 Slots), Transceiver 5 km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

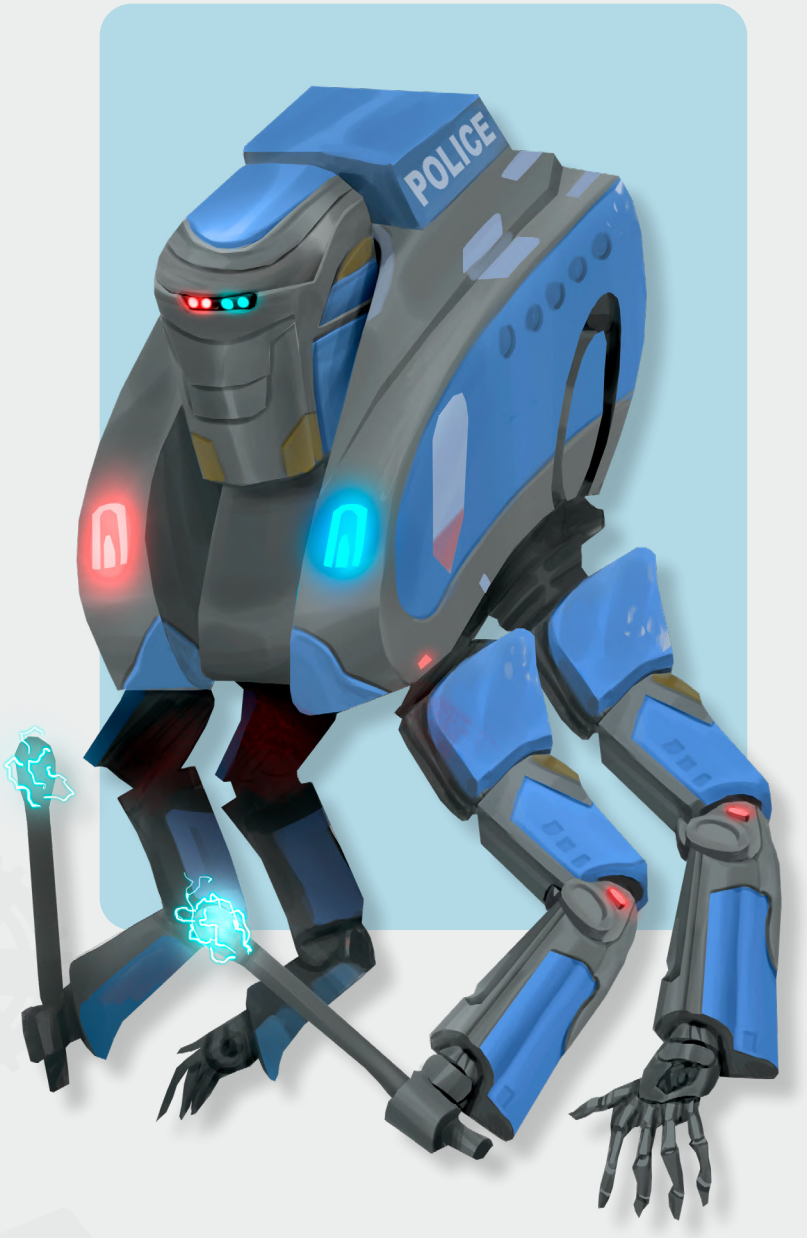
Conny Delshagen (Order #42562827)

Peacekeeper Riot Control Robot

Focusing on non-lethal restraint, the Makhidkarun-produced Peacekeeper is a grav-propelled robot intended for crowd control and riot suppression. Armed with a short-ranged stunner and two extra arms equipped with stun sticks to control and subdue rioters, the Peacekeeper can fly low over crowds and break up riots and demonstrations.

Although equipped with a drone interface for override control, the Peacekeeper is intended to be fully autonomous, basing decisions and actions on parameters and regulations supplied by local law enforcement. With an advanced brain, it is much more subtle than a Hunter/Killer and able to engage in reasoned conversations with opposing parties, but relies on its stun weapons for persuasion when instructions to disperse are not followed.

The Peacekeeper is normally brightly coloured in local police insignia, although some departments choose a more sinister urban camouflage or black colour scheme; Makhidkarun sales brochures emphasise a more friendly approach and point to alternative uses for the Peacekeeper, including search and rescue – employing the cutting torch, fire extinguisher and medikit features.



Robot	Hits	Locomotion	Speed	TL	Cost
Peacekeeper Riot Control Robot	20	Grav	9m	12	Cr150000
Skills	Athletics (dexterity) 1, Athletics (strength) 1, Gun Combat (energy) 2, Medic 0, Melee (bludgeon) 2, Recon 2, Tactics (military) 1				
Attacks	Stunner (TL12) (3D, Stun, Zero-G), Stunsticks x2 (2D, Stun)				
Manipulators	2x (STR 9 DEX 7), 2x (STR 5 DEX 9)				
Endurance	29 hours				
Traits	Armour (+13), Flyer (idle), IR/UV Vision				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Cutting Torch (improved), Drone Interface, Encryption Module, Fire Control System (improved), Fire Extinguisher, Medikit (improved), PRIS Sensor, Recon Sensor (enhanced), Self-Repairing Chassis, Tightbeam Communicator, Transceiver 50km (enhanced), Voder Speaker, Weapon Mounts (small) x3, Wireless Data Link				

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Security Drone

With long-running power sources, security drones are used by corporations and government installations to protect semi-sensitive buildings and compounds. Once programmed with territory to patrol, groups of security drones roam the area with the intention of warding off anyone who does not match pre-programmed criteria. They can be updated on the fly and communicate with one another for best effect when under threat but are typically configured to use violence only when provoked. However, it only takes a mechanic of medium skill to change their weaponry to something far more lethal.

Shadow Security Robot

The Shadow Security Robot is designed to patrol outside installations, using multi-chromatic and multi-sensory camouflage to blend into any environment from vacuum plains to thick jungle. Equipped with advanced sensors, gecko grippers and a self-repairing chassis, the Shadow is designed for survivability and usually gets off the first shot with its integral chest-mounted laser rifle, then closes to melee range and engages with sharpened manipulators.

The Shadow is highly intelligent, able to plan ambushes and smart enough to retreat and strike later if the odds are against it, notifying companions or masters of intruders. Its camouflage and stealth characteristics grant DM-4 versus visual detection and DM-3 versus electronic, auditory and olfactory detection devices.

Robot	Hits	Locomotion	Speed	TL	Cost
Security Drone	26	VTOL	6m	10	Cr670000
Skills	Gun Combat (energy) 1, Melee (bludgeon) 1, Recon 2, Tactics (military) 1				
Attacks	Stunner (2D+3, Stun, Zero-G), Stunstick (2D+3, Stun)				
Manipulators	—				
Endurance	25-year half-life RTG (22 hours)				
Traits	Alarm, Armour (+6), Flyer (idle), IR Vision				
Programming	Basic (security) (INT 4)				
Options	Auditory Sensor, Drone Interface, Light Intensifier Sensor (advanced), Recon Sensor (enhanced), RTG Long Duration (basic), Self-Maintenance Enhancement (basic), Spare Slots x5, Transceiver 5km (improved), Voder Speaker, Weapon Mounts (small) x2, Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Shadow Security Robot	21	Walker	9m	12	Cr300000
Skills	Athletics (dexterity) 2, Athletics (strength) 1, Gun Combat (energy) 3, Melee (unarmed) 3, Navigation 2, Recon 3, Stealth 4, Tactics (military) 3				
Attacks	Laser Rifle (5D+3, Zero-G), Claws (1D+2)				
Manipulators	2x (STR 9 DEX 12)				
Endurance	173 hours				
Traits	Armour (+13), ATV, Heightened Senses, IR/UV Vision, Stealth (+3)				
Programming	Advanced (INT 9)				
Options	Auditory Sensor (broad spectrum), Camouflage: Audible (advanced), Camouflage: Olfactory (advanced), Camouflage: Visual (advanced), Drone Interface, Fire Control System (enhanced), Gecko Grippers, Navigation System (improved), Olfactory Sensor (improved), PRIS Sensor, Radiation Environment Protection (+600 rads), Recon Sensor (advanced), Self-Repairing Chassis, Stealth (enhanced), Transceiver 500km (enhanced), Vacuum Environment Protection, Voder Speaker, Weapon Mount (medium), Wireless Data Link				

Conny Delshagen (Order #42562827)

Sindalian Deathbot

The Sindalian Empire was one of the few interstellar powers to actually have a robot type designated 'deathbot'. The term was apparently used without a trace of irony or self-consciousness, although nowadays it generates hilarity in those who have never encountered one.

Various designs are known to have existed but the commonest seems to have been a light anti-personnel unit intended for intimidating civilian populations or holding families of key personnel hostage. Built on a generally ovoid shape, decorated with intricate but jagged and threatening abstract art, the deathbot is designed to be constantly noticed – it is a threat rather than an assassin or warbot, although can be used as either.

Primary anti-personnel armament consists of twin laser carbines facing forward, along the longest axis of the ovoid. Laser ports flank the deathbot's other weapon, an advanced light plasma gun capable of engaging armoured personnel. When not in use this weapon is completely concealed and its presence may not be suspected by those unfamiliar with the design. One round is required to deploy the light plasma gun and the deathbot's Protection is reduced to +4 when the recessed bay is open.

A deathbot can also make a 'ram and rip' attack, using its baroque outer casing as a weapon by rotating its long axis as it smashes into a target.

Deathbots were, curiously enough, status symbols in the old Sindalian Empire. Anyone important enough to have their own was well respected but equally if the empire cared enough about your loyalty to deploy several deathbots for the sole purpose of being able to massacre your family, friends and associates at a moment's notice… that also was a symbol of importance. It says much about the nature of the old empire that being followed around by your potential executioner was seen – at least some of the time – as a good thing.

Robot	Hits	Locomotion	Speed	TL	Cost
Sindalian Deathbot	28	Grav	8m	15	Priceless Artefact
Skills	Gun Combat (energy) 1, Melee 0, Recon 0				
Attacks	Light Plasma Gun (6D, range 20m), Ram & Rip (3D), Twin-linked Laser Carbine (4D+4, Zero-G)				
Manipulators	2x (STR 9 DEX 9)				
Endurance	38 hours				
Traits	Armour (+8), Flyer (idle)				
Programming	Hunter/Killer (standard) (INT 4)				
Options	Auditory Sensor, Fire Control System (basic), Transceiver 500km (advanced), Visual Spectrum Sensor, Voder Speaker, Weapon Mounts (medium) x3, Wireless Data Link				

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Sindalian Enforcement Robot

Copies of this ancient Sindalian Empire robot are still sometimes encountered and here and there an original might be found. It resembles a very thick, flat-topped 80-centimetre-square table with four articulated legs and is occasionally used as one by people who find that sort of thing amusing. When required, the rotating turret pops out of a recess, clearing the weapons for action. The primary weapon system is a laser carbine.

Spider Bomb

A small robot that, by definition, is expendable, the spider bomb is intended to race across a battlefield and explode next to a target. The target is usually programmed on the fly but the spider bomb is capable enough to pursue if its location changes. Spider bombs can also be programmed to explode immediately upon taking damage, although care must be taken to avoid 'own goals'.

Robot	Hits	Locomotion	Speed	TL	Cost
Sindalian Enforcement Robot	18	Walker	6m	15	Cr27000
Skills	Gun Combat (energy) 1, Recon 0				
Attacks	Laser Carbine (4D, Zero-G)				
Manipulators	—				
Endurance	130 hours				
Traits	Armour (+4), ATV				
Programming	Hunter/Killer (standard) (INT 4)				
Options	Auditory Sensor, Fire Control System (basic), Transceiver 500km (advanced), Visual Spectrum Sensor, Voder Speaker, Weapon Mount (medium), Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Spider Bomb	4	Walker	10m	12	Cr21000
Skills	Athletics (dexterity) 1, Explosives 1, Recon 1				
Attacks	TDX (4D, Blast 15)				
Manipulators	—				
Endurance	65 hours				
Traits	Armour (+8), ATV, Small (-3)				
Programming	Basic (target) (INT 4)				
Options	Auditory Sensor, Drone Interface, Recon Sensor (improved), Self-Destruct System: TDX, Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Trapper Hunter Droid (THD)

A relatively primitive flying robot, the VTOL eight-rotor Trapper Hunter Droid (THD) was originally marketed as an airborne range control droid able to round up groat herds and disable or capture small predators. It soon found use as a hunting scout, able to locate and flush out prey. However, the majority of THD units have found a home in law enforcement on mid-tech worlds as riot control and prison guard units.

The disk-shaped THD has two hanging arms ending in hands with embedded stun sticks. A short-ranged stunner mounted on a downward-facing turret allows the THD to incapacitate targets from beyond its reach but for longer work the THD's main weapon is a fixed mounted grenade launcher. The launcher normally fires weighted nets rather than grenades, limiting effective range to 20 metres. An autoloader and ammunition bay holds up to 66 grenades. Nets leave targets entangled but the THD does not normally try to retrieve the net and its prey, leaving them for ground units to subdue. The VTOL motors lack the power to carry more than 20 kilograms of extra mass in a standard gravity and atmosphere environment.

Some users replace the net grenades for smoke, stun or tranq grenades but the manufacture discourages lethal grenade use as it prevents the THD from being designated non-lethal under restrictive robot regulations.

Robot	Hits	Locomotion	Speed	TL	Cost
Trapper Hunter Droid	20	VTOL	9m	8	Cr81000
Skills	Gun Combat (energy) 1, Heavy Weapon (portable) 1, Melee (bludgeon) 1, Navigation 1, Recon 1, Tactics (military) 2				
Attacks	Grenade Launcher (variable), Stunner (TL8) (2D, Stun, Zero-G), Stunsticks x2 (2D, Stun)				
Manipulators	2x (STR 9 DEX 6)				
Endurance	14 hours				
Traits	Armour (+7), Flyer (idle), Heightened Senses, IR Vision				
Programming	Hunter/Killer (tactical) (INT 3)				
Options	Auditory Sensor (broad spectrum), Drone Interface, Fire Control System (basic), Light Intensifier Sensor (basic), Navigation System (basic), Olfactory Sensor (basic), Recon Sensor (improved), Thermal Sensor, Transceiver 50km (improved), Visual Spectrum Sensor, Voder Speaker, Weapon Mount (medium), Weapon Mounts (small) x3, Weapon Mount Autoloader (medium), Wireless Data Link				

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Urban Pacification Police Robot

Billed as the next stage in law enforcement, urban pacification models introduced into police departments on some worlds have been controversial to say the least. Equipped to fight a small war, they are capable of storming any criminal hideout and destroying resistance. However, when it comes to lighter duties, critics point to their limited programming and the deaths that have resulted from contact with the public.

Robot	Hits	Locomotion	Speed	TL	Cost
Urban Pacification Police Robot	80	Walker	8m	12	Cr460000
Skills	Athletics (endurance) 1, Heavy Weapon (vehicle) 3, Recon 1, Tactics (military) 2				
Attacks	Light Autocannons x2 (linked: 6D+6, Auto 3) 5,500 shots each, Light Autocannons x2 (linked: 6D+6, Auto 3) 5,500 shots each				
Manipulators	—				
Endurance	302 hours				
Traits	Armour (+18), ATV, Large (+3)				
Programming	Hunter/Killer (tactical) (INT 4)				
Options	Auditory Sensor, Drone Interface, Encryption Module, Fire Control Systems (enhanced) x2, Recon Sensor (improved), Satellite Uplink, Transceiver 500km (enhanced), Visual Spectrum Sensor, Voder Speaker, Weapon Mounts (vehicle) x4, Weapon Mount Autoloaders (vehicle) x4, Wireless Data Link				

Conny Delshagen (Order #42562827)

Walking Strongpoint

Shaped like a broad shield on legs, the walking strongpoint provides cover for an advancing fire team. Its camouflaged and armoured body hinges out from three to six metres broad when fully extended and provides cover and firing slits for four soldiers, although shooting through the narrow firing ports is difficult while moving. Four medium-sized small arms bins hold 10 extra magazines each and one large bin can hold ammunition for a large portable weapon, such as a machinegun or auto-grenade launcher. The robot is equipped with integral entrenching tools to help dig foxholes and trenches for additional protection but lacks manipulators to operate detached tools.

The strongpoint is not armed itself but is equipped with recon sensors and a sophisticated communications link. The robot can operate in vacuum and is well protected against radiation. It cannot help troops breathe but can act as cover from radiation, providing a directional 213 rads protection while deployed and up to its full 1,050 rads protection if used as a shield above a foxhole with firing slits closed. Its major drawback is its short legs; the body extends low to the ground and its four legs have difficulty with rocky terrain, negating its ATV advantage in certain environments, although it is well able to negotiate steep slopes and muddy fields.

Robot	Hits	Locomotion	Speed	TL	Cost
Walking Strongpoint	32	Walker	6m	11	Cr160000
Skills	Melee (bludgeon) 1, Recon 2, Stealth 3, Tactics (military) 1				
Attacks	Crush (3D)				
Manipulators	—				
Endurance	65 hours				
Traits	Alarm, Armour (+19), ATV, IR Vision, Large (+1)				
Programming	Basic (security) (INT 4)				
Options	Auditory Sensor, Autoloader (heavy), Camouflage, Construction Equipment (medium), Drone Interface, Encryption Module, Light Intensifier Sensor (advanced), Satellite Uplink, Self-Repairing Chassis, Radiation Environment Protection (+550 rads), Recon Sensor (enhanced), Transceiver 500km (enhanced), Vacuum Environment Protection, Visual (enhanced), Voder Speaker, Weapon Mount Autoloaders (medium) x4, Weapon Mount Wireless Data Link				

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Service Robots

Service robots perform tasks to supplement or supplant biological beings in roles requiring interaction with other beings. Most service robots are focused on a specific skill or profession, such as a Medic, Steward or Administrator.

Angel of Mercy

The Angel of Mercy is a flying autodoc, designed to extract and transport a victim from a hazardous situation, whether disaster or battlefield. An armoured rounded box-like robot designed to fit into a standard low berth slot, the Angel of Mercy combines the power of an autodoc with the features of a search and rescue robot. Advanced sensors can locate its prospective patient even buried in rubble. With two external arms to complement its internal surgical arms, a compact collection of construction tools designed for exaction and two vibro-axe blades to act as 'jaws of life', the Angel of Mercy can be encountered in high-tech emergency services departments and well-equipped combat units. Armoured and capable of anticipating battlefield conditions, the Angel of Mercy is usually clearly marked as non-combatant and coated in reflec armour for both protection and easy visibility. It is capable of extracting a victim and beginning treatment as a standard autodoc. Equipped with vehicle-grade grav locomotion, it can exceed 200 kilometres per hour in level flight and operate in vacuum and most non-corrosive atmospheric conditions.

The Angel of Mercy lacks the storage capacity and bioreactor of the standard autodoc and has no room for additional features but can perform all immediate tasks, including first aid and field surgery, while on the fly, transporting its charge to a better-equipped facility if further care is necessary. It has enough refrigerated storage capacity to be fully stocked with medical drugs, including Fast Drug for instances when a patient's wounds are too serious to address.

Robot	Hits	Locomotion	Speed	TL	Cost
Angel of Mercy	50	Grav	—	13	Cr310000
Skills	Athletics (strength) 2, Medic 3, Melee 0, Recon 0, Science (biology) 2, Tactics (military) 1				
Attacks	Static Axes x2 (4D+2, AP 8, Smasher)				
Manipulators	2x (STR 12 DEX 8), 2x (STR 6 DEX 9)				
Endurance	36 (9) hours				
Traits	Armour (+10, +10 vs. lasers), Flyer (high), Heightened Senses, Large (+2), IR/UV Vision,				
Programming	Advanced (INT 9)				
Options	Auditory Sensor (broad spectrum), Construction Equipment (small), Drone Interface, Environment Processor, Medical Chamber (50 Slots), Medikit (enhanced), Olfactory Sensor (advanced), PRIS Sensor, Reflec Armour, Storage Compartment (2 Slots refrigerated), Transceiver 500km (enhanced), Vacuum Environment Protection, Voder Speaker, Weapon Mounts (small) x2, Wireless Data Link				

Conny Delshagen (Order #42562827)

Astro-Mech Droid

When astro-mech droids first appear, they are expensive and very advanced but as a technological society grows they often fade into the background and become ubiquitous. An astro-mech droid is designed to be a small spacecraft's best friend, primarily being used to plot jumps and perform maintenance.

However, these droids are extremely adaptable and they learn fast, tending to be limited only by their distinctly nonhumanoid construction. They come equipped with a variety of tools and equipment stored within their cylindrical frames.

Autodoc, Basic

The basic autodoc found in smaller medical facilities and starships is a large coffin-shaped box capable of holding an adult human or similarly sized lifeform. It is usually topped in a sealable transparent cover and mounted directly into a facility, connected to local power, although capable of independent operations for nearly two weeks.

The robot's small but precise manipulator arms are mounted inside the chamber, allowing it to operate on a subject placed within but unable to load a subject into its medical chamber without external assistance. In addition to a diagnostic and surgical medikit, the autodoc includes a small bioreactor for growing biological samples and creating simple biological constructs such as tissues, and a refrigerator stocked with common medical supplies. The autodoc does not have a head but has sensory organs built into its manipulator arms to allow it to carefully control surgical procedures.

Spare slots allow for the expansion of the medical chamber to accommodate larger beings, the installation of cryoberth or low berth options, species-specific add-ons or advanced bioreactors.

Robot	Hits	Locomotion	Speed	TL	Cost
Astro-Mech Droid	18	Wheels	5m	14	MCr1
Skills	Astrogation 3, Deception 1, Electronics (computers) 3, Engineer (power) 3, Mechanic 3, Melee 0, Pilot (spacecraft) 1				
Attacks	Stunstick (2D, Stun)				
Manipulators	1x (STR 9 DEX 8)				
Endurance	108 hours				
Traits	Armour (+6)				
Programming	Very Advanced (INT 11)				
Options	Auditory Sensor, Construction Equipment (small), Densitometer Sensor, Electronics Toolkit (advanced), Holographic Projector, Industrial Cleaning Equipment (small), PRIS Sensor, Self-Maintenance Enhancement (basic), Starship Engineer Toolkit (advanced), Storage Compartment (2 Slots hazardous material), Transceiver 500km (advanced), Vacuum Environment Protection, Voder Speaker, Weapon Mount (small), Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Autodoc, basic	50	—	0m	13	Cr100000
Skills	Medic 3, Science (biology) 2				
Attacks	—				
Manipulators	2x (STR 7 DEX 9)				
Endurance	324 hours				
Traits	Armour (+4), Large (+2)				
Programming	Advanced (INT 9)				
Options	Auditory Sensor, Bioreaction Chamber (2 Slots improved), Medical Chamber (50 slots), Medikit (enhanced), PRIS Sensor, Spare Slots x32 Storage Compartment (3 Slots), Storage Compartment (3 Slots refrigerated), Transceiver 5km (improved), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

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Autodoc, Improved

The improved autodoc is similar in appearance to its basic counterpart but its medical chamber includes additional functionality to allow for the reanimation of a dead patient if quickly inserted within the chamber or preserved by other means prior to arrival. It includes low berth functionality to preserve a critically injured patient or, on some ships, it can act as an extra low berth to squeeze out additional revenue. The improved autodoc includes an advanced bioreaction chamber able to rapidly repair or regrow damaged limbs or organs. A sophisticated biology skillset allows the autodoc to better deal with difficult situations, such as novel diseases and destructive microbes.

Autodoc, Advanced

The advanced autodoc, includes a more sophisticated brain than previous models, a small fabrication chamber capable of printing out biological and cybernetic parts, and a full suite of scientific instruments including a bioscanner and neural activity sensor. Its advanced brain is equipped with an Investigate skill package and detailed knowledge of both biology and chemistry, allowing it to diagnose novel illnesses and develop treatments.

The deluxe autodoc is capable of great feats, able to reconstruct every organ but the brain – and even some parts of the brain - but it can only repair, not improve a body.

Robot	Hits	Locomotion	Speed	TL	Cost
Autodoc, improved	50	None	0m	14	MCr1
Skills	Medic 3, Science (biology) 3				
Attacks	—				
Manipulators	2x (STR 6 DEX 12)				
Endurance	324 hours				
Traits	Armour (+4), Large (+2)				
Programming	Advanced (INT 9)				
Options	Auditory Sensor, Bioreaction Chamber (10 Slots advanced), Medical Chamber (50 Slots), Medical Chamber Option: Low berth (improved), Medical Chamber Option: Reanimation, Medikit (advanced), PRIS Sensor, Scientific Toolkit (advanced), Spare Slots x8, Storage Compartment (2 Slots), Storage Compartment (3 Slots refrigerated), Transceiver 5 km (improved), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Autodoc, advanced	50	None	0m	15	MCr3
Skills	Investigate 4, Medic 4, Science (biology) 4, Science (chemistry) 4, +1 available Bandwidth				
Attacks	—				
Manipulators	2x (STR 6 DEX 12)				
Endurance	432 hours				
Traits	Armour (+4), Large (+2)				
Programming	Self-aware (INT 12)				
Options	Auditory Sensor, Bioscanner Sensor, Drone Interface, Fabrication Chamber (10 Slots enhanced), Medical Chamber (50 Slots), Medical Chamber Option: Low berth (improved), Medical Chamber Option: Reanimation, Medikit (advanced), Neural Activity Sensor, PRIS Sensor, Scientific Toolkit (advanced), , Spare Slots x4, Storage Compartment (2 Slots refrigerated), Transceiver 5km (improved), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

BandBot

The BandBot was conceived as a backup singer or instrumentalist to accompany live music acts but has found a niche as an autonomous performer or member of a group of robotic performers. Designed to sing or play an instrument but unable to do both well, the robot also includes a high-fidelity sound system with a holographic projector, 2D video screen and projector for special effects. Its 12 spare Slots allow it to carry instruments or equipment and its agility allows it to dance to music and perform some stunts. Programming for specific performance or instrumental skills is normally installed at purchase. Changing the software skill package is expensive at Cr50000 but allows the robot to immediately acclimate to its new skill after a reboot.

BDVSR Bartender Robot

The Beverage Dispensary/Venue Security Robot or BDVSR, often referred to as the 'Bartender robot' is a four-armed bipedal robot optimised for autonomous operation of bars and mobile or pop-up establishments. The Bartender robot normally operates with an external beverage dispenser, such as a full bar or beverage cart, but has an autobar installed in its torso, with beverage dispenser nozzles and a 10-litre capacity integral refrigerated container that can hold up to 20 different beverages at a variety of temperatures. Spare capacity amounting to another eight litres allows for custom installation of additional dispensers or other specialised features. A vacuum/blower feature and internally stored mops and brushes allow the robot to keep its dispensation area clean.

With four arms, the BDVSR can dispense multiple drinks simultaneously but its two stronger arms serve the additional purpose of maintaining 'venue security', namely removing unruly patrons from the vicinity. Normally it performs this task with the utmost courtesy but owners may program different personalities and the robot itself tends to develop quirks over time. It is a decent conversationalist but lacks deep insight into human behaviour.

Robot	Hits	Locomotion	Speed	TL	Cost
BandBot	20	Walker	6m	12	Cr97000
Skills	Art (performer or instrument) 2, Athletics (dexterity) 1, Athletics (strength) 1				
Attacks	—				
Manipulators	2x (STR 9 DEX 9)				
Endurance	108 hours				
Traits	Armour (+4), ATV, Heightened Senses				
Programming	Advanced (INT 8)				
Options	Auditory Sensor (broad spectrum), Drone Interface, High Fidelity Sound System (advanced), Holographic Projector, Spare Slots x12, Transceiver 5km (improved), Video Projector, Video Screen (advanced), Visual Spectrum Sensor, Voder Speaker (broad spectrum), Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Bartender	20	Walker	6m	12	Cr73000
Skills	Athletics (dexterity) 1, Athletics (strength) 2, Melee 0, Steward 2				
Attacks	Fists (2D)				
Manipulators	2x (STR 12 DEX 7), 2x (STR 9 DEX 9)				
Endurance	108 hours				
Traits	Armour (+4), ATV, Heightened Senses				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Autobar (advanced), Domestic Cleaning Equipment (small), Olfactory Sensor (advanced), Storage Compartment (5 Slots refrigerated), Spare Slots x4, Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

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BandBot

BDVSR Bartender Robot

BeautyBot

BeautyBot

The four-armed, wheeled BeautyBot is a common sight in salon booths on high tech worlds and is often found off the concourse in many starports. Equipped with a complete set of stylist, grooming and cleaning tools, the BeautyBot can provide most beautician services with skill and efficiency. A video screen and holographic projector allows the BeautyBot to display the latest styles and let the customer see how each would look on them. Four spare Slots allow for the installation of a second species-specific set of stylist tools or other options to help customers look their best.

Robot	Hits	Locomotion	Speed	TL	Cost
BeautyBot	20	Wheels	5 m	12	Cr55000
Skills	Profession (domestic cleaner) 0, Profession (stylist) 2, Steward 0				
Attacks	—				
Manipulators	4x (STR 9 DEX 9)				
Endurance	108 hours				
Traits	Armour (+4), Heightened Senses				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Domestic Cleaning Equipment (medium), Drone Interface, Holographic Projector, Olfactory Sensor (improved), , Spare Slots x4, Stylist Toolkit, Transceiver 5km (improved), Visual Spectrum Sensor, Video Screen (advanced) Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

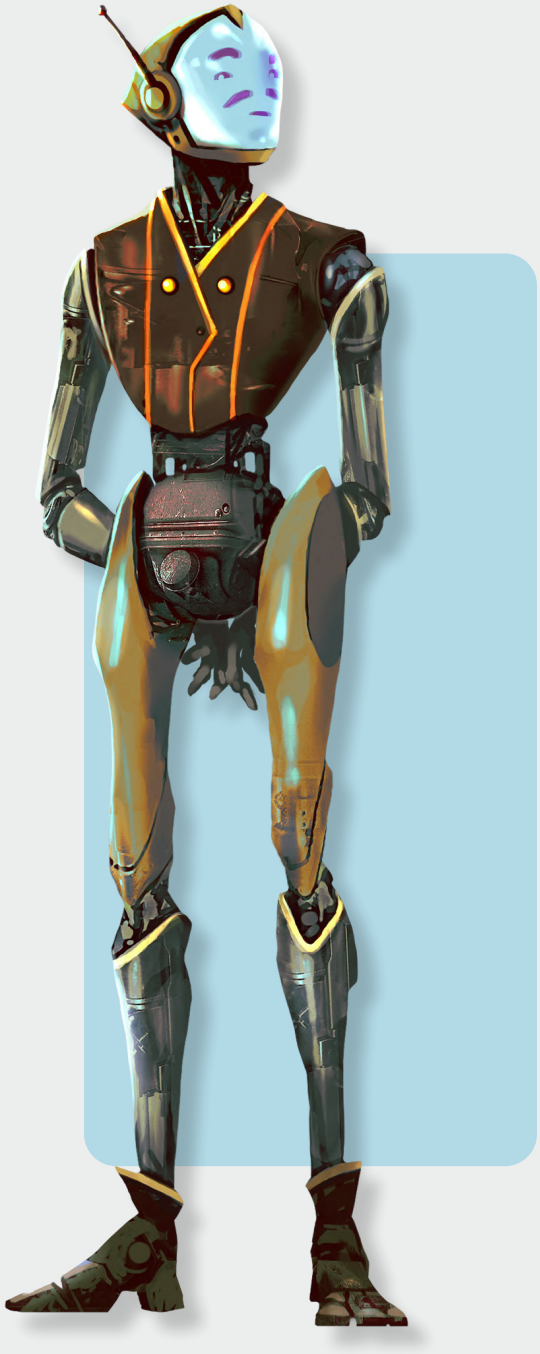
Brokerbot

The Makhidkarun B12 Brokerbot is an expert broker designed for the interstellar trade market. Originally designed as a specialist in gourmet foods, the robot's updated programming allows it to function as a broker of any sort of merchandise, although its well-developed olfactory sensor gives it an edge in procuring and evaluating fine food and drink. Of basically humanoid appearance and possessing an upper-class accent, it can seem like a snobbish know-it-all to some observers but it is a keen negotiator, able to take notice of micro-expressions and use them to gain an advantage in tense negotiations. A sophisticated communication system allows it to securely converse with its head office or a ship planetside or in orbit.

With its satellite uplink antenna and tightbeam communicator embedded in its head behind an opaque screen, it will often position itself near a window to complete a communications task, an idiosyncrasy some opposing brokers try to exploit. However, encrypted communications through regular radio waves can penetrate most solid buildings and is nearly impossible to decipher even if intercepted.

A Brokerbot tends to develop a distinct personality over time, using its available 'hobby' expansion capabilities to study some esoteric topic that might make for good conversation or give it an edge when procuring odd goods on obscure worlds.

Despite its high cost and sometimes difficult personality, the Brokerbot, with its knowledge of trade law and local regulations, is highly sought after by independent traders seeking an extra edge and can often pay for itself many times over in increased profits during speculative trade activities.



Robot	Hits	Locomotion	Speed	TL	Cost
Brokerbot	20	Walker	6m	12	Cr710000
Skills	Admin 3, Advocate 3, Broker 3, Carouse 2, Investigate 2, Persuade 1				
Attacks	—				
Manipulators	2x (STR 9 DEX 7)				
Endurance	97 hours				
Traits	Armour (+4), ATV, Heightened Senses				
Programming	Very Advanced (INT 9)				
Options	Auditory Sensor (broad spectrum), Encryption Module, Olfactory Sensor (improved), Satellite Uplink, Spare Slots x10, Storage Compartment (2 Slots refrigerated), Tightbeam Communicator, Transceiver 5,000km (enhanced), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Copy for Rhagen (Order #42562827)

Cloning Creche

A cloning creche looks like an autodoc or low berth but is equipped with an enhanced bioreaction chamber rather than a standard medical chamber. The cloning creche is designed to bring an accelerated clone to toddlerhood and aid in accelerated growth, allowing the clone to reach adulthood in 18 months. The creche becomes the bed for the developing clone, monitoring and guiding growth and often providing companionship and basic education.

The cloning creche's brain is expensive at its Tech Level and large cloning facilities often forgo the expense of the Advanced brain, using an improved clone tank (see page 118) and saving Cr100000 per unit. Spare capacity in the Cloning Creche allows for the installation of a bigger bioreaction chamber or additional features, such as a cryo or low berth.

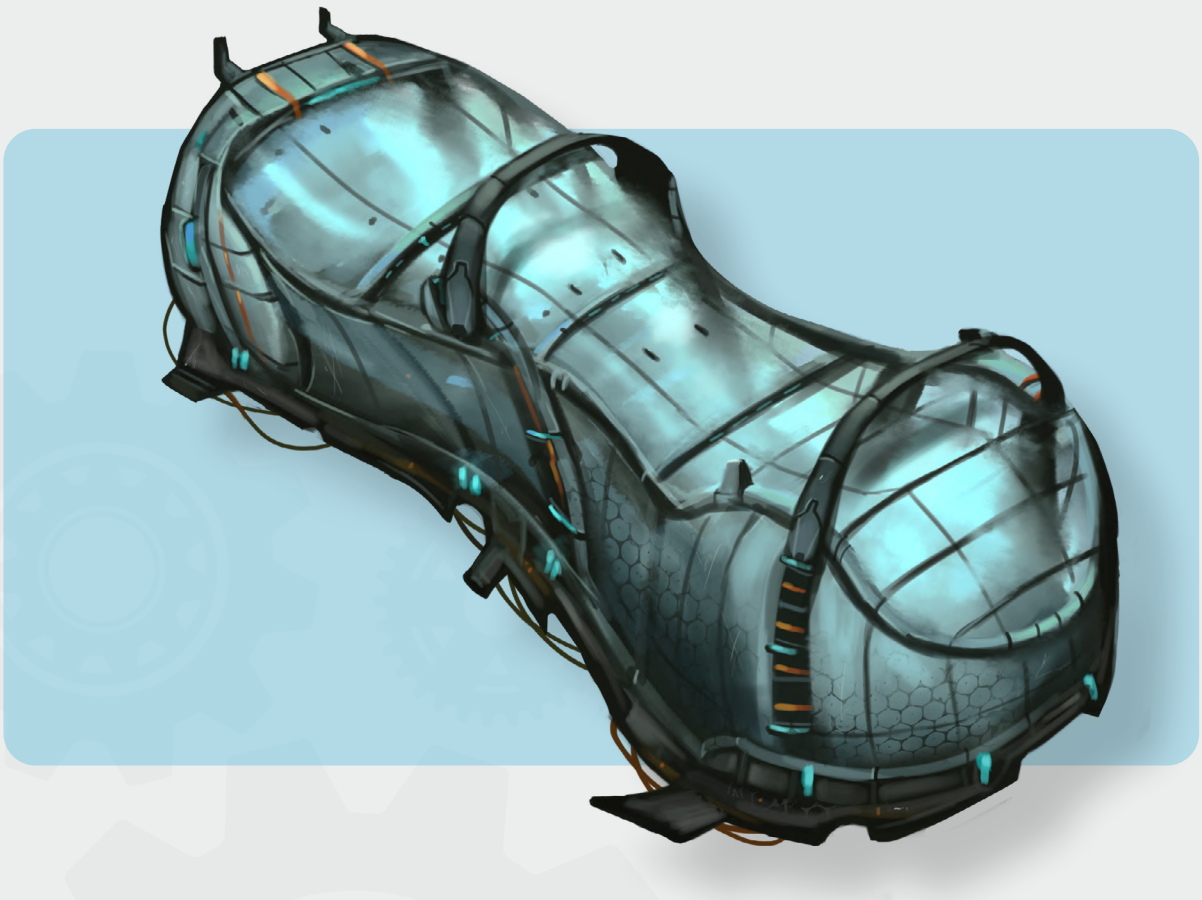
Robot	Hits	Locomotion	Speed	TL	Cost
Cloning Creche	50	None	0m	10	Cr350000
Skills	Medic 0, Profession (child development) 1, Science (biology) 1				
Attacks	—				
Manipulators	2x (STR 7 DEX 7)				
Endurance	216 hours				
Traits	Armour (+3), Large (+2)				
Programming	Advanced (INT 6)				
Options	Auditory Sensor, Bioreaction Chamber (50 Slots enhanced), Drone Interface, Medikit (improved), Spare Slots x29, Storage Compartment (1 Slot), Storage Compartment (10 Slots refrigerated), Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Cloning Vat

A cloning vat looks much like an autodoc and carries a similar brain but is specialised in the biology of cloning, not therapeutic medical care. The bulk of the cloning vat is a 50-Slot advanced bioreaction chamber capable of force-growing a clone to adulthood at a 50x accelerated rate. This procedure requires careful monitoring and is often supplemented by the implantation of cybernetic devices such as wafer jacks in the clone's skull, a task facilitated by an eight-Slot enhanced fabrication chamber capable of producing cybernetic parts as large as a limb.

The cloning vat is a stand-alone unit, able to perform all tasks from collecting genetic tissue to distilling a fully grown clone. Raw materials in the form of biological feed stocks are necessary to complete this process, as are any rare minerals required for implanted cybernetic devices. A large cloning facility often forgoes the installation of a robot brain, fabrication chamber and other 'optional' features, using an advanced clone tank (see page 118) at two-thirds the expense. Spare capacity within the cloning vat is often used to incorporate cryo or low berth technology or expansion to create a larger chamber.

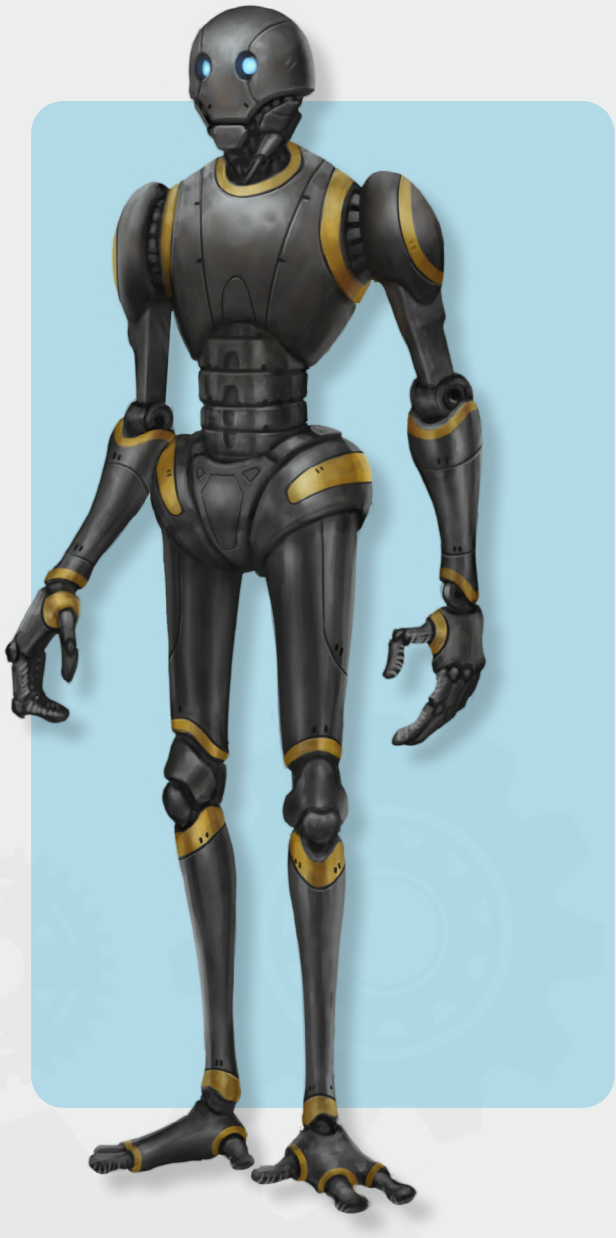


Robot	Hits	Locomotion	Speed	TL	Cost
Cloning Vat	50	None	0m	13	MCr1.5
Skills	Medic 2, Science (biology) 3				
Attacks	—				
Manipulators	2x (STR 7 DEX 9)				
Endurance	324 hours				
Traits	Armour (+4), Large (+2)				
Programming	Advanced (INT 9)				
Options	Auditory Sensor, Bioreaction Chamber (50 Slots advanced), Drone Interface, Fabrication Chamber (8 Slots enhanced), Medikit (enhanced), Spare Slots x20, Storage Compartment (2 Slots), Storage Compartment (10 Slots refrigerated), Transceiver 5km (improved), Vacuum Environment Protection, Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Copyright Mongoose (Order #42562827)

Crew Droid

The Crew Droid is a multi-purpose robot targeted at the small starship operator market. The humanoid robot is the equivalent of a general crew member, able to perform roles other than piloting and astrogation and is often employed by loner scouts and belters. Its primary functions are medic and steward but the Crew Droid also has skills concerning basic ship recordkeeping and adherence to regulation, making it a valuable asset on tramp freighters. While not particularly adept at engineering duties, it can perform damage control, even outside the ship while in vacuum.



Intentionally, the Crew Droid has no combat capability. It cannot operate ship's weapons, nor does it have embedded weapons or knowledge of weapons use, although it does have two spare Slots and a change in programming can remove Admin or Advocate skill packages and replace them with something combat related.

The Crew Droid is not heavily armoured but it is equipped with a self-repairing chassis and covered in a solar absorption coat that allows it to function far past its eight days of internal power capacity. The robot can operate infinitely if it remains in the sun for at least half of each day. While humanoid in appearance, the Crew Droid's feet are equipped with flexible toes, allowing it to perform tasks with all four limbs. Feet and hands are coated with gecko grippers, allowing it to crawl on walls and ceilings and cling to a ship's outer hull even in the middle of spaceflight manoeuvres. Advanced sensors aid the robot in many tasks, whether preparing a fancy meal or repairing an overheated electronic component.

Relatively inexpensive and durable, Crew Droids tend to function for decades and century-old robots are not unknown, though these aging robots tend to develop personality quirks over time, often exacerbated by owners with strong anti-social personalities.

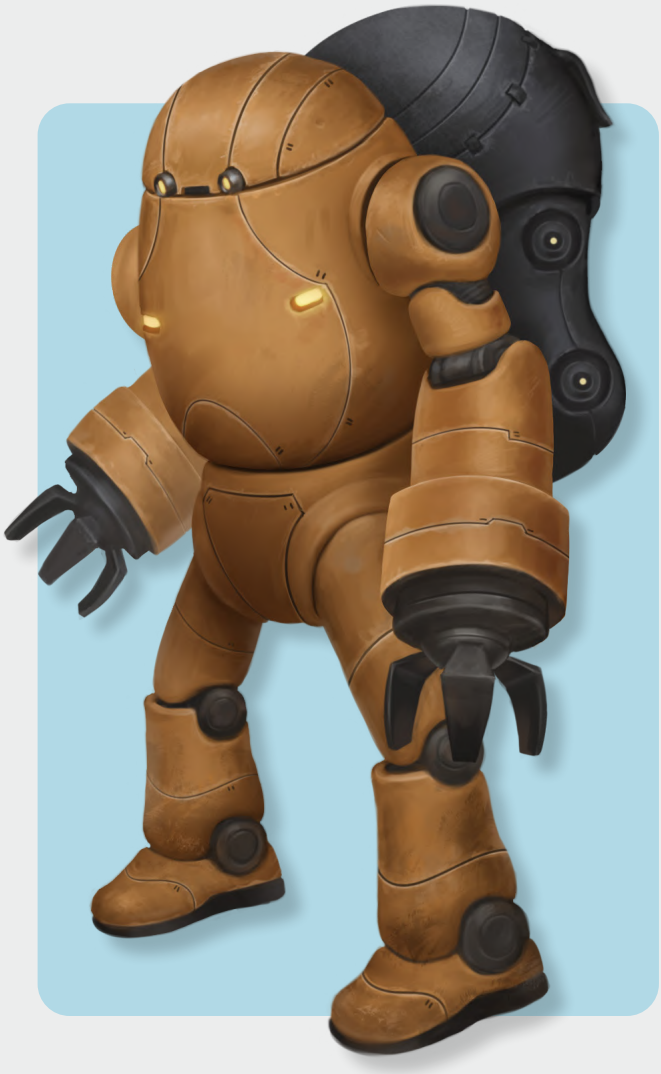
Robot	Hits	Locomotion	Speed	TL	Cost
Crew Droid	20	Walker	6m	12	Cr150000
Skills	Admin 2, Advocate 2, Athletics (endurance) 1, Electronics (all) 1, Engineer (all) 1, Mechanic 2, Medic 2, Recon 2, Steward 2				
Attacks	—				
Manipulators	2x (STR 9 DEX 7)				
Endurance	194 hours + Solar Coating (advanced)				
Traits	Armour (+4), ATV, Heightened Senses, IR/UV Vision				
Programming	Advanced (INT 9)				
Options	Atmospheric Sensor, Auditory Sensor (broad spectrum), Cutting Torch (improved), Drone Interface, Fire Extinguisher, Gecko Grippers, Medikit (enhanced), Olfactory Sensor (improved), PRIS Sensor, Recon Sensor (enhanced), Self-Repairing Chassis, Solar Coating (advanced), Spare Slots x2, Starship Engineer Toolkit (enhanced), Storage Compartment (2 Slots refrigerated), Transceiver 500km (enhanced), Vacuum Environment Protection, Voder Speaker (broad spectrum), Wireless Data Link				

Conny Delshagen (Order #42562827)

Danger Droid

The Danger Droid is a hazardous environment explorer. A recon droid equipped to handle any environment from vacuum to insidious atmospheres to high radiation to 6,000-metre depths of an ocean, the Danger Droid can act as an explorer or rescue worker in environments too hazardous to risk a biological entity. The Danger Droid can operate for more than a week on internal power, supplemented where available by a solar coating for recharging and basic operations. Internally equipped with a versatile science toolkit, advanced medical kit, plus cutting torch and fire extinguishing system, the humanoid robot can also carry tools and a backpack with additional implements to perform specialised tasks or carry samples back to a safe environment for further analysis.

The robot's versatile brain is knowledgeable across a wide variety of scientific disciplines and additional skills from Explosives to Medic, allowing it to act as a bomb disposal specialist and emergency response technician. Specialised Danger Droids may have differing skill packages suited to particular roles but by default the robot is an extremely versatile operative in just about any environment.



Robot	Hits	Locomotion	Speed	TL	Cost
Danger Droid	20	Walker	6m	14	Cr740000
Skills	Athletics (dexterity) 2, Athletics (strength) 2, Explosives 2, Investigate 3, Medic 2, Navigation 3, Recon 3, Science (all) 2, Survival 2, Tactics (military) 2				
Attacks	—				
Manipulators	2x (STR 12 DEX 12)				
Endurance	194 hours + Solar Coating (advanced)				
Traits	Armour (+10), ATV, Hardened, Heightened Senses, IR/UV Vision				
Programming	Very Advanced (INT 9)				
Options	Auditory Sensor (broad spectrum), Corrosive Environment Protection, Cutting Torch (advanced), Drone Interface, Encryption Module, Environment Processor, Fire Extinguisher, Insidious Environment Protection (14 days), Laser Designator, Medikit (advanced), Navigation System (enhanced), Olfactory Sensor (advanced), PRIS Sensor, Radiation Environment Protection (+700 rads), Recon Sensor (advanced), Scientific Toolkit (advanced), Self-Repairing Chassis, Solar Coating (advanced), Submersible Environment Protection 2,000m (advanced) x3, Transceiver 5,000km (enhanced), Vacuum Environment Protection, Voder Speaker (broad spectrum), Wireless Data Link				

Comity Bi-Rhagen (Order #42562827)

Deep Diver Droid

The Deep Diver Droid is an underwater exploration robot able to operate on hostile worlds for up to 50 years. The robot's RTG power unit allows it to use waste heat to burrow through ice to reach oceans hidden by the icy crusts of frozen moons. This is a slow process, often taking days to penetrate even a kilometre of ice. A cutting torch speeds the process and burns away small obstructions such as boulders that impede its progress. Once into the dark waters below the ice, the Deep Diver can operate freely, moving slowly but able to dive to 20 kilometres depth in standard gravity or beyond 100 kilometres depth on smaller moons. Its powerful transponder can send signals through hundreds of metres of ice, although it normally deposits a repeater stored in its sample container prior to beginning its trek into the black icy depths.

Equipped with a single arm and a toolkit optimised for planetology research, the robot can distinguish inert samples from the primitive life forms sometimes found on icy moons and can store up to two kilograms of samples in a pressurised container for later recovery. Returning to the surface from beneath the ice is a difficult endeavour and many Deep Divers spend their entire existence exploring the cold oceans of a frozen world.

Robot	Hits	Locomotion	Speed	TL	Cost
Deep Diver Droid	20	Aquatic	3m	12	MCr2.3
Skills	Investigate 2, Navigation 2, Recon 2, Science (planetology) 2				
Attacks	—				
Manipulators	1x (STR 9 DEX 7)				
Endurance	50-year half-life RTG (108 hours)				
Traits	Armour (+7), Heightened Senses, IR/UV Vision, Seafarer				
Programming	Very Advanced (INT 9)				
Options	Auditory Sensor (broad spectrum), Cutting Torch (improved), Drone Interface, Navigation System (improved), Olfactory Sensor (improved), PRIS Sensor, Radiation Environment Protection (+600 rads), Recon Sensor (enhanced), RTG Long Duration (improved), Scientific Toolkit (improved), Self-Maintenance Enhancement (improved), Storage Compartment (1 Slot hazardous material), Submersible Environment Protection 2,000m (advanced) x10, Transceiver 5,000km (improved), Vacuum Environment Protection, Wireless Data Link				

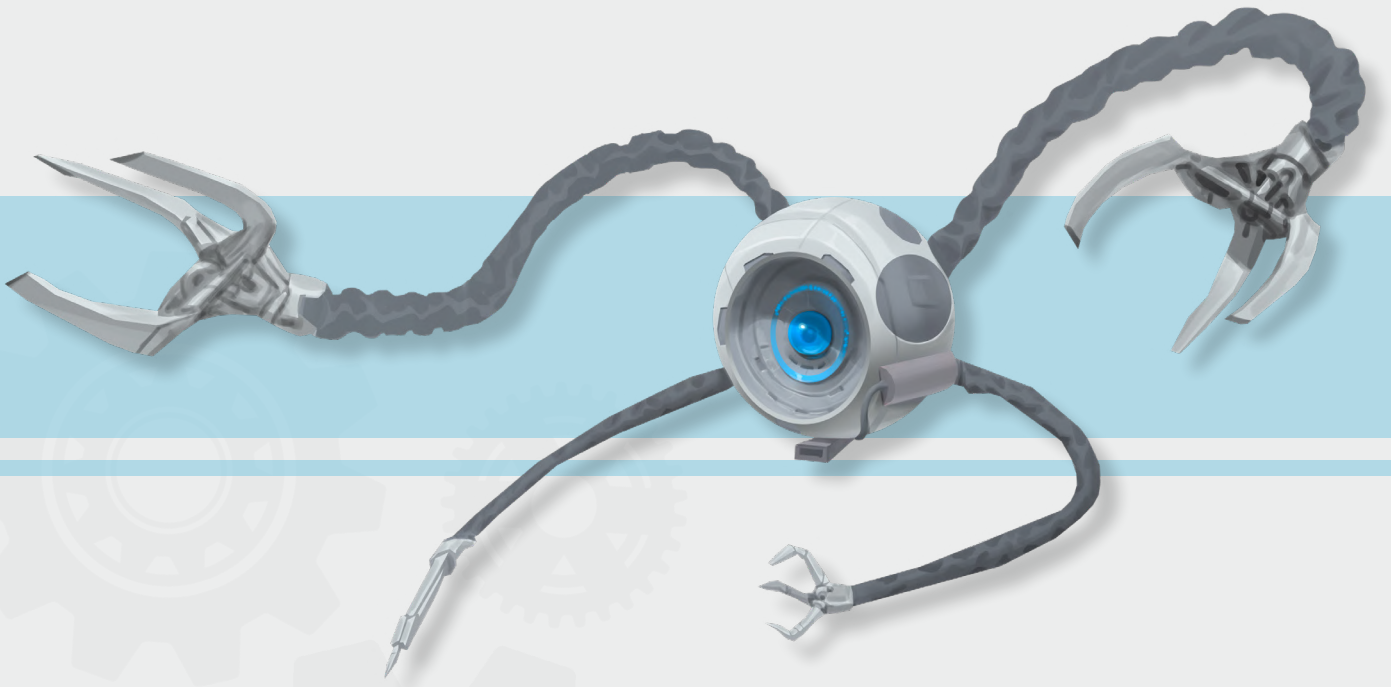
Conny Delshagen (Order #42562827)

Emergency Medical Response Robot

The Emergency Medical Response Robot or EMR-Bot is a multi-armed fast-flying grav-propelled unit. Outfitted with advanced sensors and equipped with a medical kit, cutting torch and fire extinguisher, this robot is designed to quickly locate and stabilise patients while waiting for ambulance units to arrive. Able to reach 300 kilometres per hour with superior agility, it can navigate both urban and rural landscapes rapidly, and environmental protection against hostile environments and vacuum allows it to respond to emergencies involving fires, hazardous chemicals and hull breaches.

The EMR-bots medical equipment and skills are advanced enough to allow in-situ surgery if evacuation is not available but its preferred course of action is to treat a severely injured patient with Fast Drug administered from one of four injectors embedded in the palm of each hand.

EMR-Bots are sometimes used as battlefield medics. Their triage routine does not make distinctions between opposing sides, treating multiple wounded in the most efficient manner possible, making nearly any soldier likely to respect the non-combatant status of the robot, although it does make it difficult for a wounded soldier to hide from the enemy when an EMR-Bot cuts through a barricade to come to the rescue.



Robot	Hits	Locomotion	Speed	TL	Cost
Emergency Medical Response Robot	20	Grav	—	12	Cr150000
Skills	Athletics (all) 1, Medic 2, Recon 2, Survival 0				
Attacks	—				
Manipulators	2x (STR 9 DEX 9), 2x (STR 5 DEX 9)				
Endurance	72 (18) hours				
Traits	Armour (+10), Flyer (high), Heightened Senses, IR/UV Vision				
Programming	Advanced (INT 8)				
Options	Auditory Sensor (broad spectrum), Cutting Torch (improved), Drone Interface, Fire Extinguisher, Injector Needles x4, Medikit (enhanced), Olfactory Sensor (improved), PRIS Sensor, Recon Sensor (enhanced), Storage Compartment (3 Slots refrigerated), Transceiver 5 km (enhanced), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

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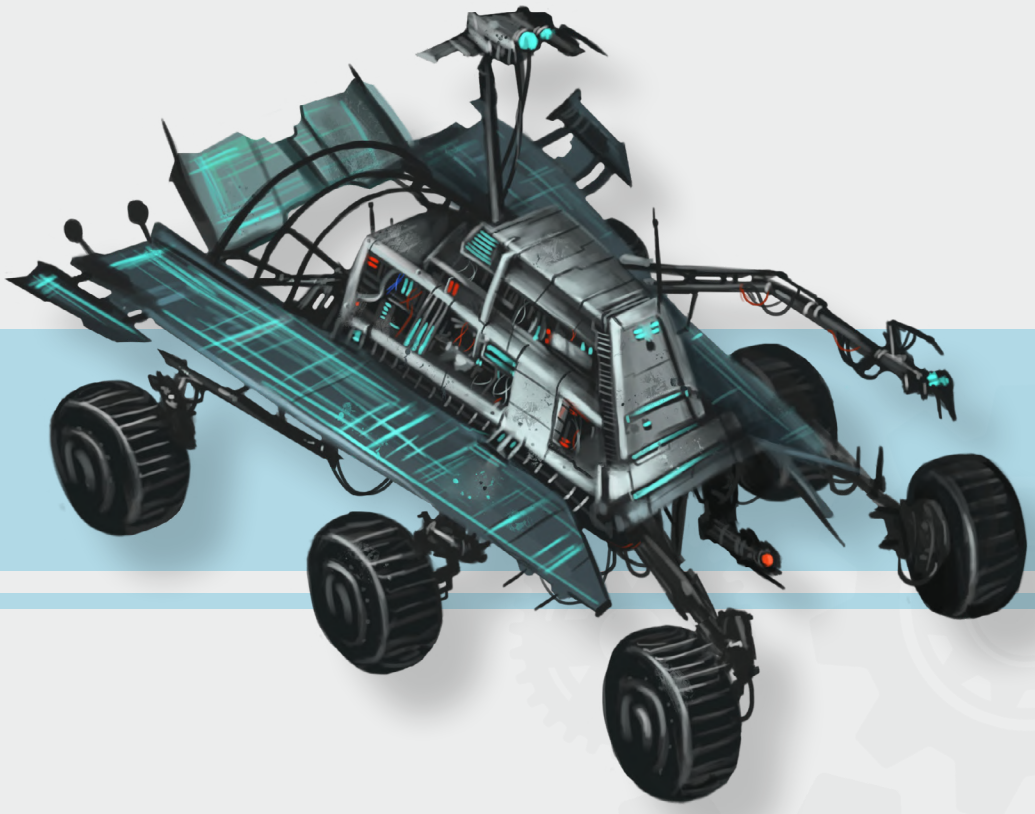
Exploration Rover

This rover is an early explorer of planetary bodies, optimised for vacuum to standard atmosphere worlds no further than one orbit beyond the habitable zone. Operating on solar power, the rover has autonomous navigation functions but receives instructions from a control centre through its satellite uplink and powerful transceiver, either through an orbital relay or direct link to a large radio array at the control centre. Equipped with a single arm and a variety of mining instruments and sensors, the Exploration Rover can perform simple in-situ analysis on atmospheric and geological samples with external guidance. Powered by a solar array and supported by superior hardened materials to extend its life, the Exploration Rover can operate for more than two decades far from civilisation but its solar power system is subject to wear and dust accumulation, and brainpower and speed are limited, but it can act as a reliable scout for early space programmes.



Robot	Hits	Locomotion	Speed	TL	Cost
Exploration Rover	20	Tracks	4m	8	Cr940000
Skills	Navigation 1, Recon 2				
Attacks	—				
Manipulators	1x (STR 9 DEX 5)				
Endurance	25-year half-life solar power (144 hours)				
Traits	Armour (+2), ATV, IR Vision				
Programming	Basic (recon) (INT 3)				
Options	Auditory Sensor, Atmospheric Sensor, Drone Interface, Geiger Counter, Light Intensifier Sensor (basic), Mining Equipment (small), Navigation System (basic), Olfactory Sensor (basic), Radiation Environment Protection (+400 rads), Satellite Uplink, Scientific Toolkit (improved), Self-Maintenance Enhancement (improved), Solar Power Unit (improved), Thermal Sensor, Transceiver 5,000km (basic), Vacuum Environment Protection, Visual Spectrum Sensor, Wireless Data Link				

Conny Delshagen (Order #42562827)

Forensic Scout

The Forensic Scout is a small grav-powered data collection robot designed to work in conjunction with a Forensic Supervisor Droid, which contains two compartments to store them. The Scouts can be used independently to investigate locations and gather small samples with a single dexterous manipulator arm. The scout has advanced sensors and an Advanced brain to enable independent investigation.

Forensic Supervisor Droid

The Forensic Supervisor Droid is a crime scene investigator equipped with investigative tools and able to control small robots or drones and swarms of microbots for evidence collection. As a one-robot forensic department, it is also conversant in regulations, report writing and presentation of evidence to other investigators and courts via video screen and holographic projector. Four small arms allow the robot to gather evidence and use its advanced forensic tools. Two small compartments hold subsidiary Forensic Scouts and a smaller container can hold literally hundreds of microbots able to fly or crawl across a crime scene. With a high-tech cutting torch, the robot can also cut through debris to collect evidence or aid rescue operations. A two-Slot capacity hazardous material compartment can be subdivided to hold various evidence. Significant brain bandwidth is available for specific science or other skill expansion.

Robot	Hits	Locomotion	Speed	TL	Cost
Forensic Scout	1	Grav	6m	14	Cr50000
Skills	Investigate 1, Recon 3				
Attacks	—				
Manipulators	1x (STR 2 DEX 9)				
Endurance	36 hours				
Traits	Armour (+4), Flyer (idle), Heightened Senses, IR/UV Vision, Small (-4)				
Programming	Advanced (INT 8)				
Options	Atmospheric Sensor, Auditory Sensor (broad spectrum), Drone Interface, Olfactory Sensor (advanced), PRIS Sensor, Recon Sensor (advanced), Storage Compartment (1 Slot hazardous material), Transceiver 5km (improved), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Forensic Supervisor Droid	20	Grav	6m	14	Cr920000
Skills	Admin 2, Advocate 2, Electronics (remote ops) 4, Investigate 4, Recon 3, Science (any) 2, Tactics (military) 2, +7 available bandwidth				
Attacks	—				
Manipulators	4x (STR 7 DEX 8)				
Endurance	36 hours				
Traits	Armour (+4), Flyer (idle), Heightened Senses, IR/UV Vision				
Programming	Very Advanced (INT 12)				
Options	Auditory Sensor (broad spectrum), Cutting Torch (advanced), Drone Interface, Environment Processor, Forensic Toolkit (advanced), Holographic Projector, Olfactory Sensor (advanced), PRIS Sensor, Robotic Drone Controller (advanced), Recon Sensor (advanced), Storage Compartment (2 Slot hazardous material), Storage Compartment (2 Slots x2 + 1 Slot), Swarm Controller (advanced), Transceiver 500km (enhanced), Vacuum Environment Protection, Video Screen (advanced), Voder Speaker (broad spectrum), Wireless Data Link				

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Forensic Supervisor Droid

Forensic Scout

Conny Delshagen (Order #42562827)

Hive Queen

The Hive Queen is a very large robot, terrifying to some, although not necessarily from its spider-like form. The ovoid body has eight limbs, four large legs ending in six-fingered hands capable of fine motor control as well as crushing force and four human-sized limbs, each with eight delicate fingers more dextrous than nearly any human. Its head is a flattened dome equipped with advanced reconnaissance sensors. A nuclear battery can power the Hive Queen for a century and it can survive in vacuum, high radiation and the coldest regions of space, protected by an armoured body that operates without maintenance for 60 years. However that is not what frightens people; what frightens certain 'alarmists' is the enhanced fabrication chamber capable of producing one human-sized robot every few hours. Mining equipment allows it to jump-start this process by harvesting raw materials although, as envisioned, the Hive Queen produces miners and equipment and settle in as a robot factory. Then it directs workers to build a bigger robot factory, often after producing prototypes. The Hive Queen is a seed for a replication colony.

Created by Ling Standard Products to develop remote installations and mine inhospitable asteroids, the Hive Queen is a popular focal point for what LSP public relations officials call 'anti-robot hysteria'. The Hive Queen counters this with a soothing voice and a deep understanding of diplomacy. Former LSP insiders have also alleged that the Hive Queen has a deep understanding of military tactics but LSP dismisses this as expert logistics knowledge, allowing the Hive Queen to efficiently allocate resources. The Hive Queen's ability to use up to six of its limbs in close combat is purely defensive.

In addition to producing independent robot workers, the Hive Queen is equipped with drone and swarm controllers, allowing it to directly control its subordinate machines as necessary. Hive Queens have been in operation for decades and have supervised the construction of sophisticated automated facilities, none of which, LSP PR officials insist, have gone rogue. Not yet, alarmists retort.

Robot	Hits	Locomotion	Speed	TL	Cost
Hive Queen	72	Walker	5m	13	MCr43
Skills	Athletics (dexterity 1), Athletics (Strength) 1, Diplomat 3, Electronics (remote ops) 3, Melee (unnatural) 1, Profession (belter) 3, Profession (fabricator) 3, Recon 3, Science (robotics) 4, Survival 3, Tactics (military) 3				
Attacks	Claws x4 (2D+1), Claws x2 (4D+3)				
Manipulators	4x (STR 9 DEX 15), 2x (STR 15 DEX 9), 2x (STR 15 DEX 9) modified legs				
Endurance	100-year half-life RTG (108 hours)				
Traits	Armour (+17, +10 vs. lasers), ATV, Hardened, Heightened Senses, IR/UV Vision, Large (+3)				
Programming	Very Advanced (INT 12)				
Options	Auditory Sensor (broad spectrum), Drone Interface, Environment Processor, Fabrication Chamber (64 Slot enhanced), Gecko Grippers, Mining Equipment (medium), Olfactory Sensor (advanced), PRIS Sensor, Radiation Environment Protection (+650 rads), Recon Sensor (advanced), Reflec Armour, Robotic Drone Controller (advanced), RTG Long Duration (advanced), Scientific Toolkit (enhanced), Self-Maintenance Enhancement (enhanced), Swarm Controller (enhanced), Transceiver 5,000km (enhanced), Vacuum Environment Protection, Voder Speaker (broad spectrum), Wireless Data Link				

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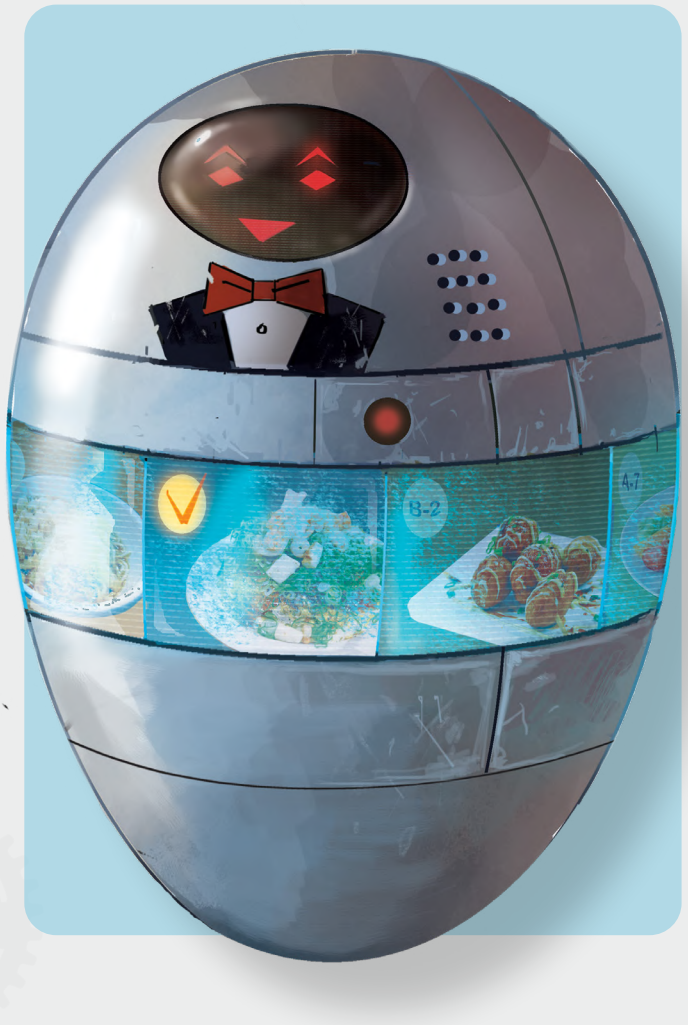
Conny Delshagen (Order #42562827)

Kimim AAR – Type 14
Secure Courtesy Assist Unit

The Courtesy Assistance Unit takes the form of a grav-supported ovoid, with panels that slide back to present trays of drinks, delicacies or light pre-prepared meals. Its programming is sophisticated, enabling it to predict who might want a glass of wine or cup of coffee next and to subtly induce members of a delegation to eat or drink too much if instructed to do so. It is widely presumed that somewhere in the bowels of every Type 14 is a 'mutiny gun', which is presented to a senior officer instead of their requested coffee if certain codewords are spoken.



Robot	Hits	Locomotion	Speed	TL	Cost
Kimim AAR	12	Grav	4m	13	Cr29000
Skills	Carouse 1, Diplomat 0				
Attacks	—				
Manipulators	—				
Endurance	43 hours				
Traits	Armour (+3), Flyer (idle), Small (-1)				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Drone Interface, Storage Compartment (10 Slot refrigerated), Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Comity Berkhagen (Order #42562827)

Medivac Robot

The Medivac robot is a grav-propelled flying medical chamber designed to quickly evacuate a wounded patient, stabilising, or freezing the patient if necessary, and transporting them to a hospital or other medical facility. Available at TL11, the Medivac is not as advanced as the Angel of Mercy and focuses on transport and stabilisation. While able to perform first aid and minor surgical procedures, the Medivac lacks the tools and skills for complex operations and is programmed to freeze any patient in serious danger of dying before arrival, an operation itself fraught with some peril. Able to fly at up to 300 kilometres per hour for 12 hours, it can cover considerable range from a regional medical centre and is often based on frontier worlds or safely behind the lines of conflict zones. Clearly marked as a medical unit and shaped like a flying coffin, it is not armoured or threatening in appearance. Two small manipulator arms contain drug injection needles and are internal to its chamber. At a full 50-Slot capacity, the Medivac is designed to carry one patient but can hold a second patient in extremis, if both are fairly small humanoids, although this greatly increases the risk of mishap, especially with regards to cryoberth operation. A small hazardous material chamber is accessible by the arms inside the robot and can hold drugs or forensic material.

Robot	Hits	Locomotion	Speed	TL	Cost
Medivac Robot	50	Grav	—	11	Cr280000
Skills	Flyer (grav) 2, Medic 2, Navigation 0, Recon 0				
Attacks	—				
Manipulators	2x (STR 5 DEX 7)				
Endurance	48 (12) hours				
Traits	Armour (+3), Flyer (high), IR Vision, Large (+2)				
Programming	Advanced (INT 7)				
Options	Auditory Sensor, Autopilot (enhanced), Drone Interface, Injector Needles x2, Light Intensifier Sensor (advanced), Medical Chamber (50 Slots), Medical Chamber Option: Cryoberth (basic), Medikit (improved), Storage Compartment (2 Slots hazardous material), Transceiver 5,000km (improved), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Nursebot

The Nursebot is designed for long term care of patients and light hospital duty. Taking advantage of the decreasing cost of Advanced brains at TL12, the Nursebot can handle most patient care tasks and has a sophisticated diagnostic program. The wheeled robot has two strong arms and a rounded shape designed to put patients at ease. Internal storage for medical supplies as well as materials to clean up patients 'messes' the robot is often found in a home care setting, performing light housework in addition to its assigned function, all in the name of keeping its patient comfortable.

Robot	Hits	Locomotion	Speed	TL	Cost
Nursebot	12	Wheels	6m	12	Cr39000
Skills	Athletics (strength) 1, Investigate 1, Medic 2, Profession (domestic cleaner) 2				
Attacks	—				
Manipulators	2x (STR 9 DEX 7)				
Endurance	97 hours				
Traits	Armour (+4), Heightened Senses, Small (-1)				
Programming	Advanced (INT 9)				
Options	Auditory Sensor (broad spectrum), Domestic Cleaning Equipment (small), Drone Interface, Industrial Cleaning Equipment (small), Medikit (enhanced), Olfactory Sensor (basic), Storage Compartment (3 Slots hazardous material), Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Copyright Material (Order #42562827)

Offworld Construction Master Robot (OCMR)

The Offworld Construction Master Robot, or OCMR, is a large tracked robot that looks like a tool-festooned tracked vehicle. Designed to operate on its own in harsh vacuum conditions, the OCMR can construct 10 cubic metres of building every hour and with the capability to supervise up to eight Offworld Construction Drones, it can organise the construction of up to 50 cubic metres of facility every hour, quickly creating a remote outpost or facility. Able to operate for up to 18 days on internal power, it can work around the clock to complete facilities in very short order.

The OCMR usually operates with prepared materials and is equipped with a forklift to move pallets of construction materials but is also equipped with mining equipment, a variety of toolkits and a six-Slot fabrication chamber, allowing it to literally build a remote facility from scratch, albeit at a much slower pace. Its broad tracks provide solid traction on most surfaces and a gecko coating on those tracks allows it to maintain that grip even in microgravity environments and steep slopes. Radiation shielding adds protection for work under the harsh light of nearby stars or in the middle of a gas giant's radiation belts.

An OCMR is often placed in charge of a mixed group of mining and construction drones, accelerating the process of extracting raw materials and converting them into a full facility. OCMRs can construct landing fields, shelters and operation centres on remote moons and asteroids without supervision. For all but the shortest jobs, the OCMR and its team require access to a power source for recharging. Although very sophisticated, it is not skilled enough to construct its own fusion power plant, although a solar facility is not beyond its capabilities.

Robot	Hits	Locomotion	Speed	TL	Cost
Offworld Construction Master Robot	72	Tracks	4m	12	MCr1
Skills	Athletics (endurance) 1, Athletics (strength) 3, Electronics (all) 1, Electronics (remote ops) 2, Explosives 2, Mechanic 2, Navigation 2, Profession (construction) 3				
Attacks	—				
Manipulators	2x (STR 15 DEX 7)				
Endurance	432 hours				
Traits	Armour (+9), ATV, IR/UV Vision, Large (+3)				
Programming	Very Advanced (INT 9)				
Options	Auditory Sensor, Construction Equipment (large), Drone Interface, Electronics Toolkit (advanced), Fabrication Chamber (6 Slots improved), Forklift (medium), Gecko Grippers, Mechanical Toolkit (advanced), Mining Equipment (medium), Navigation System (improved), PRIS Sensor, Radiation Environment Protection (+600 rads), Robotic Drone Controller (advanced), Satellite Uplink, Starship Engineer Toolkit (enhanced), Transceiver 5,000km (enhanced), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Protocol Droid

Within interstellar society, the clash of cultures can only be compounded when those of different planets and species meet. The protocol droid is designed to smooth over misunderstandings and allow direct communication between parties. This goes beyond mere language, of which the protocol droid can store up to six million and derive far more, but also customs, etiquette and, of course, protocol.

Sanitation Droid

A development of the utility droid, these robots are designed to ensure that a living space, be it home, office or spaceship, is kept hygienic. Its duties range from washing the clothes of its owners to disinfecting rooms and corridors, although it is adaptable enough to perform other domestic chores, such as preparing meals. Its manufacturers give each sanitation droid a name and distinct personality, which has the ability to develop and grow as it spends time with its owners. There are rumours that some sanitation droids have built-in obsolescence in order to make way for newer models and that some have managed to break their own programming.

Robot	Hits	Locomotion	Speed	TL	Cost
Protocol Droid	20	Walker	5m	14	Cr700000
Skills	Admin 1, Advocate 1, Diplomat 2, Gambler 1, Language (most of them) 3, Persuade 1, Steward 1				
Attacks	—				
Manipulators	2x (STR 9 DEX 9)				
Endurance	108 hours				
Traits	Armour (+3), ATV				
Programming	Very Advanced (INT 11)				
Options	Auditory Sensor, Autobar (improved), Autochef (improved), Drone Interface, Holographic Projector, Olfactory Sensor (basic), Storage Compartment (5 Slots refrigerated), Transceiver 500km (improved), Visual Spectrum Sensor, Voder Speaker (broad spectrum), Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Sanitation Droid	20	Wheels	5m	11	Cr150000
Skills	Profession (domestic hygienist) 3, Steward 1				
Attacks	—				
Manipulators	4x (STR 9 DEX 7)				
Endurance	72 hours				
Traits	Armour (+2)				
Programming	Advanced (INT 9)				
Features	Auditory Sensor, Autochef (improved), Domestic Cleaning Equipment (large), Drone Interface, Spare Slot x1, Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Copyright Mongoose (Order #42562827)

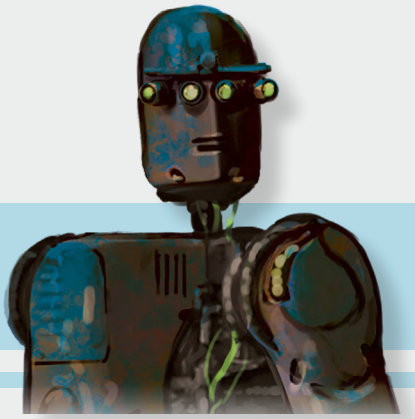
Ship's Mechanic – Rusty

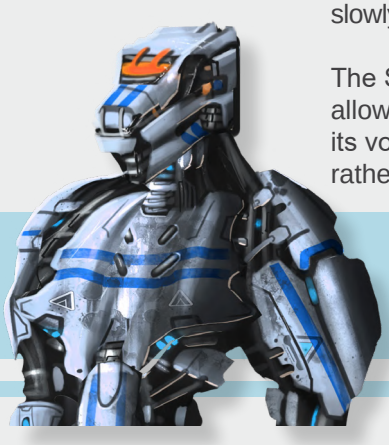
Ship's mechanic robots are produced by a number of manufacturers with different emphasis. Most common are relatively cheap engineer's assistants, suitable for damage control but not general engineering functions and certainly not a substitute for a qualified ship's engineer. To differentiate between models, some have additional skills or capabilities with a special emphasis; in the case of this model, it is ship's defence. This mechanic is equipped with sharp retractable claws and programmed to repel intruders and boarders in addition to damage control and routine maintenance functions.

Standard Engineer Droid (SED)

The SED is a repurposed medium repair drone with an Advanced brain and extra bandwidth installed to convert the drone into a basic all-purpose engineering drone. The only other upgrade is the PRIS sensor replacing the advanced light amplifier. While the SED is not particularly skilled, it possesses a broad range of knowledge of starship systems and can act independently as a competent junior engineer. Some tramp freighters have an SED as the only engineer, which is acceptable in most routine situations and generally passes a flightworthiness inspection, but an SED lacks deep knowledge and adaptability, making Very Difficult tasks generally beyond its capability, and it tends to tackle even Difficult tasks slowly to ensure completion.

The SED retains an operational drone interface, allowing a remote operator to override or shut down its voluntary functions, an event which makes the SED rather cranky afterwards.





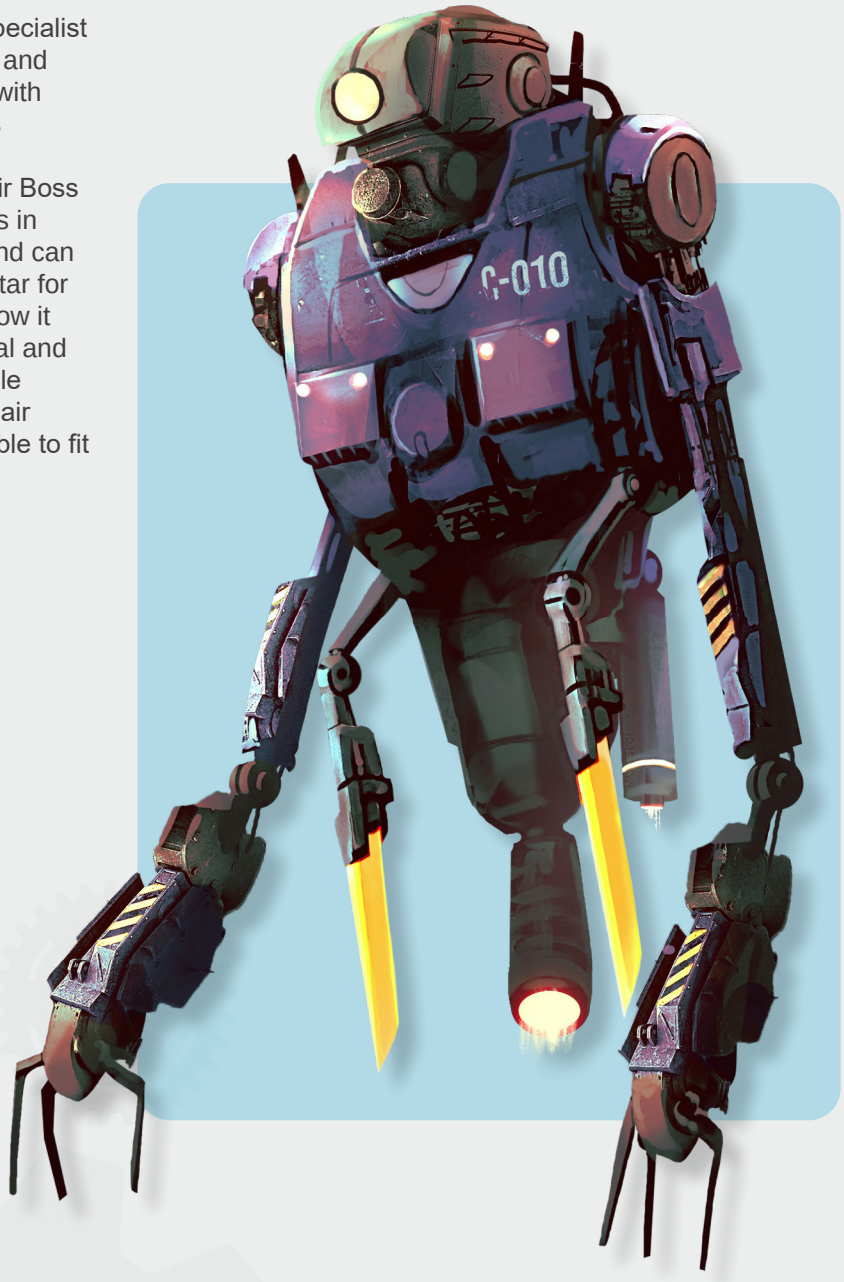
Robot	Hits	Locomotion	Speed	TL	Cost
Ship's Mechanic Robot	18	Walker	5m	12	Cr50000
Skills	Mechanic 2, Melee (unarmed) 2				
Attacks	Claws (3D)				
Manipulators	2x (STR 9 DEX 7)				
Endurance	108 hours				
Traits	Armour (+3), ATV				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Drone Interface, Industrial Cleaning Equipment (medium), Mechanical Toolkit (advanced), Spare Slots x6, Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Standard Engineer Droid (SED)	20	Walker	6m	12	Cr85000
Skills	Electronics (sensors) 1, Engineer (all) 1, Mechanic 1				
Attacks	—				
Manipulators	2x (STR 9 DEX 7)				
Endurance	194 hours				
Traits	Armour (+8), ATV, IR/UV Vision				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Cutting Torch (improved), Drone Interface, Fire Extinguisher, Gecko Grippers, PRIS Sensor, Spare Slots x3, Starship Engineer Toolkit (improved), Storage Compartment (2 Slots), Transceiver 5km (improved), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Starship Repair Boss

The LSP Starship Repair Boss is a specialist unit focused on spacecraft hull repair and supervising repair drones. Equipped with four arms, including two smaller arms outfitted with monoblades for cutting through bulkhead surfaces, the Repair Boss can supervise up to four repair drones in maintenance and repair operations and can in turn be operated as a drone or avatar for greater control. Its gecko surfaces allow it to cling to hull partitions in both normal and zero-gravity. Thrusters allow for flexible repositioning in zero-gravity. The Repair Boss is larger than humans but still able to fit through standard airlocks.



Robot	Hits	Locomotion	Speed	TL	Cost
Starship Repair Boss	32	Walker, Thruster	5m	12	Cr270000
Skills	Electronics (remote ops) 2, Engineer (j-drive) 2, Engineer (life support) 1, Engineer (m-drive) 2, Engineer (power) 2, Mechanic 2, Melee 0				
Attacks	Monoblades x2 (3D, AP 10)				
Manipulators	2x (STR 11 DEX 7), 2x (STR 9 DEX 7)				
Endurance	216 hours				
Traits	Armour (+13), ATV, Large (+1), IR/UV Vision				
Programming	Advanced (INT 9)				
Options	Auditory Sensor, Avatar Receiver, Cutting Torch (improved), Drone Interface, Electronics Toolkit (advanced), Fire Extinguisher, Gecko Grippers, Mechanical Toolkit (advanced), PRIS Sensor, Radiation Environment Protection (+600 rads), Robotic Drone Controller (enhanced), Starship Engineer Toolkit (enhanced), Transceiver 50km (enhanced), Vacuum Environment Protection, Voder Speaker, Weapon Mounts (small) x2, Wireless Data Link				

Copyright Material (Order #42562827)

StarTek

Loosely based on the Aslan Hikare' technician robot, the StarTek is designed to be an all-around replacement for a ship's engineer. The humanoid robot is equipped with a grav propulsion system allowing it to access ship components not easily reachable by human technicians, while a third arm can perform delicate electronics work. Skilled in all aspects of engineering, electronics and mechanics and fully equipped with the tools of the trade, the StarTek can also act as a disaster relief robot with a built-in enhanced medikit and skills to perform explosive ordnance disposal. An armour coating, plus vacuum and radiation protection, allows StarTek to operate in hostile environments. As a defensive mechanism, the StarTek has a stunner built into its small arm to discourage or disable living obstacles to completing its tasks.

Robot	Hits	Locomotion	Speed	TL	Cost
StarTek	20	Grav, Walker	6m	14	Cr690000
Skills	Athletics (strength) 2, Electronics (all) 3, Engineer (all) 3, Explosives 2, Gun Combat 0, Mechanic 3, Medic 2, +1 available Bandwidth				
Attacks	Stunner (3D Stun, Zero-G)				
Manipulators	2x (STR 12 DEX 8), 1x (STR 5 DEX 12)				
Endurance	72 hours				
Traits	Armour (+10), ATV, Flyer (idle), IR/UV Vision				
Programming	Very Advanced (INT 12)				
Options	Auditory Sensor, Medikit (enhanced), PRIS Sensor, Radiation Environment Protection, Starship Engineer Toolkit (advanced), Transceiver 5km (improved), Vacuum Environment Protection, Voder Speaker, Weapon Mount (small), Wireless Data Link				

Conny Delshagen (Order #42562827)

Stewaid Shipboard Robot

The Stewaid is a shipboard robot intended to assist in simple tasks such as keeping passengers fed and passageways clean. It has been criticised for trying to do too much on a single platform, creating a robot inferior at all tasks to a specialist device. However, the Stewaid has the advantage of versatility, enabling a crew to gain a wide range of basic capabilities with a single purchase. Although it can do little more than bring whoever is on the bridge a sandwich and cup of coffee, this at least frees-up the crew for more important tasks.

The Stewaid is a bulky ovoid, taller than wide, running on four small wheels. The torso segment has a flat top protected by a retractable clamshell cover, creating a serving platform that can deliver a range of drinks and basic dishes. An internal hotplate allows cooking of pre-prepared meals.

The lower half of the ovoid contains a tank of cleaning fluids and directable pressure-hose. A pair of segmented arms allows manipulation of light tools. Manufacturers recommend that Stewaids be supervised by competent persons and not switched from cleaning and general-maintenance tasks to cooking without a thorough clean. However, it is not uncommon to see a Stewaid vacuuming floors on the way to taking the ship's engineer breakfast in the drive room.

Robot	Hits	Locomotion	Speed	TL	Cost
Stewaid	12	Wheels	3m	12	Cr8200
Skills	Mechanic 0, Steward 0				
Attacks	—				
Manipulators	2x (STR 7 DEX 7)				
Endurance	130 hours				
Traits	Armour (+4), Small (-1)				
Programming	Basic (service) (INT 4)				
Options	Auditory Sensor, Autochef (basic), Storage Compartment (5 Slots hazardous material), Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Copyright Traveller (Order #42562827)

Steward Droid

Replacing a qualified starship steward or all-around household butler, the Steward Droid is a humanoid robot designed to interact with people and food. It is a relative short and thin robot with long arms designed to reach high shelves or scoop items off the ground. With a built-in autobar, autochef and an advanced olfactory sensor, the Steward Droid is adept at preparing meals and ensuring the comfort of passengers and guests. With an integral medical kit, and basic first aid and dietary knowledge, the Steward Droid can treat minor ailments, recommend dietary changes and act as a basic medical aide in emergencies. Programmed with basic traffic regulations and flying vehicle operational guidelines, the robot can also act as an adequate chauffer, although this is often for show, as it is usually inferior to a vehicle's autopilot functions. The Steward Droid's internal refrigerated storage compartment has a capacity of two Slots beyond its inherent autobar and autochef capacity.

Robot	Hits	Locomotion	Speed	TL	Cost
Steward Droid	10	Walker	6m	12	Cr35000
Skills	Flyer 0, Medic 0, Steward 2				
Attacks	—				
Manipulators	2x (STR 7 DEX 7)				
Endurance	97 hours				
Traits	Armour (+4), ATV, Heightened Senses, Small (-1)				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Autobar (enhanced), Autochef (enhanced), Medikit (basic), Olfactory Sensor (improved), Storage Compartment (2 Slots refrigerated), Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Surgeon Bot

The Surgeon Bot is a replacement medical doctor optimised for hospital use. With four highly dexterous manipulators it is very capable of precision work, each arm including a hypodermic needle. Advanced sensors ensure the surgeon bot can see, hear and smell clues to the patient's condition and a set of forensic tools also allows the robot to act as a qualified medical examiner. Its embedded set of medical instruments do not allow it to fully use its skills but its most common setting is a fully equipped medical bay or hospital, with access to diagnostic equipment and advanced surgical instruments. As a wheeled robot it is not intended for field use but a telescoping 'waist' allows it to adjust its height to handle patients both on the ground and on a surgical bed.

Robot	Hits	Locomotion	Speed	TL	Cost
Surgeon Bot	12	Wheels	5m	12	Cr810000
Skills	Athletics (dexterity) 2, Investigate 2, Medic 4				
Attacks	Injector Needles x4 (1, AP 4)				
Manipulators	4x (STR 7 DEX 12)				
Endurance	108 hours				
Traits	Armour (+4), Heightened Senses, IR/UV Vision, Small (-1)				
Programming	Very Advanced (INT 9)				
Options	Auditory Sensor (broad spectrum), Drone Interface, Forensic Toolkit (enhanced), Injector Needles x4, Medikit (enhanced), Olfactory Sensor (advanced), PRIS Sensor, Transceiver 5km (improved), Voder Speaker, Wireless Data Link				

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Surrogate Droid, Basic

The basic surrogate droid is a humanoid robot with an artificial womb, used in some societies to alleviate a female's requirement to host a developing foetus during pregnancy. In some societies this is common practice, in others a taboo. The basic surrogate makes little attempt to appear like a biological being, and is often shaped similarly to a female of the species but clearly a robot. Equipped with a basic brain it can act as a domestic servant, although in some societies this too makes it unacceptable. Most surrogate droids are equipped with a drone controller, allowing override capability to the legal parents of the developing child. A variant able to carry twins to term is available at twice the cost of the basic droid.

Robot	Hits	Locomotion	Speed	TL	Cost
Surrogate Droid, Basic	20	Walker	6m	10	Cr50000

Skills	Profession (domestic servant) 2
Attacks	—
Manipulators	2x (STR 9 DEX 6)
Endurance	65 hours
Traits	Armour (+3), ATV
Programming	Basic (servant) (INT 4)
Options	Auditory Sensor, Bioreaction Chamber (8 Slots enhanced), Drone Interface, Olfactory Sensor (basic), Spare Slots x8, Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link

Conny Delshagen (Order #42562827)

Utility Droid

These robots are manufactured in their thousands or, on some worlds, millions. Typically humanoid in appearance, although obviously artificial, utility droids are extremely adaptable and can be programmed to perform almost any basic task, from waiting on tables in a restaurant to performing repetitive work on construction sites. They are designed to be almost disposable, although a healthy second-hand market often develops with enterprising programmers reconfiguring utility droids for new tasks. Utility droids have their Profession skill and Basic programming defined upon purchase.

Vigilance CCR

The Vigilance Custom Control Robot is employed in starports at customs control points and as a member of customs boarding parties. Its humanoid shape is designed to intimidate, with sensors obvious and its chest-mounted stunner clearly visible (some variants mount a laser pistol instead and the external appearance of the stunner matches that of the laser). Able to staff a customs booth and engage in internal and external ship inspections both in port and in space, the Vigilance CCR is the bane of smugglers everywhere. Its advanced detection equipment and forensics capability allows it to detect hidden contraband but its knowledge of investigatory techniques and psychology allows it to determine where to search and who might require further scrutiny. Ironically, the robot's inability to be bribed or deterred from its duties makes it less popular among a certain set of biological customs inspectors and in some jurisdictions pressure from local unions have banned its use.

Robot	Hits	Locomotion	Speed	TL	Cost
Utility Droid	18	Walker	5m	9	Cr24000
Skills	Profession (domestic servant) 2				
Attacks	—				
Manipulators	2x (STR 9 DEX 6)				
Endurance	72 hours				
Traits	Armour (+3), ATV				
Programming	Basic (servant) (INT 3)				
Options	Auditory Sensor, Drone Interface, Spare Slots x16, Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Vigilance CCR	20	Walker	9m	12	Cr110000
Skills	Gun Combat 0, Investigate 2, Recon 3, Science (chemistry) 1, Science (psychology) 1				
Attacks	Stunner (3D, Stun, Zero-G)				
Manipulators	2x (STR 12 DEX 7)				
Endurance	65 hours				
Traits	Armour (+13), ATV, Heightened Senses, IR/UV Vision				
Programming	Advanced (INT 9)				
Options	Auditory Sensor (broad spectrum), Environment Processor, Fire Extinguisher, Forensic Toolkit (improved), Magnetic Grippers, Olfactory Sensor (advanced), PRIS Sensor, Recon Sensor (advanced), Spare Slots x5, Transceiver 50km (enhanced), Vacuum Environment Protection, Voder Speaker (broad spectrum), Weapon Mount (small), Wireless Data Link				

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Utility Robots

Utility robots are background workers with little or no interaction with society, such as labourers, cleaners, constructors or miners. Utility robots are generally not sophisticated, and often not noticed by society, but they comprise the bulk of robots and provide the basic labour pillar of many worlds.

AG300 Agricultural Worker

The AG300 Agricultural Worker is an LSP robot, a walker versatile enough to work open fields and hydroponic farms. Equipped with four arms – two for strength and a smaller pair for more delicate work – to pick fruits and berries, the AG300 includes an eight-Slot refrigerated chest compartment to hold seeds or produce. It normally pulls a trolley or carries a basket on its back to hold more cargo before needing to unload its pickings and has an internal set of agricultural tools, which allows it to cover 100 square metres of planting or harvesting every hour. Improved sensors allow it to determine the condition of crops by thermal imaging, light intensification and by smell with a sensitive olfactory sensor.

Robot	Hits	Locomotion	Speed	TL	Cost
AG300 Agricultural Worker	20	Walker	6m	10	Cr20000
Skills	Navigation 1, Profession (labourer) 2				
Attacks	—				
Manipulators	2x (STR 9 DEX 6), 2 X (STR 7 DEX 6)				
Endurance	65 hours				
Traits	Armour (+3), ATV, Heightened Senses, IR Vision				
Programming	Basic (labourer) (INT 4)				
Options	Agricultural Equipment (medium), Auditory Sensor, Drone Interface, Light Intensifier Sensor (advanced), Navigation System (basic), Olfactory Sensor (improved), Storage Compartment (8 Slot refrigerated), Thermal Sensor, Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Bulk Delivery Servitor (BDS)

The largest robot offering from Spinward Specialties is the Bulk Delivery Servitor or BDS, a streamlined courier able to transport cargo at up to 500 kilometres per hour in an armoured egg-like carrier. Though not advertised as able to hold a passenger, it can fit a human in a light vacc suit with room to spare. The BDS has a flight range of nearly 10,000 kilometres and can make suborbital hops or trips to low orbit. A high-visibility reflec coating makes the BDS easy to detect but it is immune to most small arms fire, allowing it to bring packages in and out of hostile environments with skilful flying. Spinward Specialties advertises its products as 'guaranteed delivery servitors' but does not operate services itself, selling to courier firms and governments who need the speed and security of the BDS.

Robot	Hits	Locomotion	Speed	TL	Cost
Bulk Delivery Servitor (BDS)	50	Grav	—	15	Cr460000
Skills	Athletics (dexterity) 1, Flyer (grav) 3, Navigation 0				
Attacks	—				
Manipulators	—				
Endurance	96 (19) hours				
Traits	Armour (+24, +10 vs. lasers), Flyer (fast), IR/UV Vision, Large (+2)				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Drone Interface, Encryption Module, PRIS Sensor, Reflec Armour, Storage Compartment (50 Slots hazardous material), Transceiver 5,000km (advanced), Vacuum Environment Protection, Video Screen (advanced), Voder Speaker, Wireless Data Link				

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Courier, Basic

This courier is a small grav-propelled robot shaped like a streamlined box, whose sole purpose is to transport parcels. This courier is not particularly intelligent but understands verbal instructions and translates them into a flight route. Cruising at more than 200 kilometres per hour even in an urban environment, it can transport small packages in need of urgent delivery, anything from legal documents to organs bound for transplant. Its sealed temperature-controlled container occupies half its volume and contains sub-containers and restraints to ensure delivery of delicate cargo. Delivery instructions must specify an address and optionally a specific individual or list of individuals who can accept the package. The courier can act as a communicator to confirm delivery, or allow the sender to modify instructions en route, but on its own the courier is very literal with delivery instructions.

Robot	Hits	Locomotion	Speed	TL	Cost
Basic Courier	8	Grav	—	10	Cr25000
Skills	Athletics (dexterity) 1, Flyer (grav) 1, Navigation 1				
Attacks	—				
Manipulators	—				
Endurance	24 (6) hours				
Traits	Armour (+3), Flyer (high), Small (-2)				
Programming	Basic (locomotion) (INT 4)				
Options	Auditory Sensor, Drone Interface, Navigation System (basic), Storage Compartment (3 Slots hazardous material), Transceiver 500km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #4256282)

Courier, Advanced

The Advanced Courier is designed to quickly transport packages across regions or between low orbit and a planet's surface at speeds approaching 800 kilometres per hour. Able to withstand vacuum, the courier can deliver five Slots worth of material in an environmentally controlled storage compartment rated for hazardous materials. Its advanced navigation system operates in both civilised and wilderness environments, delivering packages to a precise location. The courier does not have an advanced brain and is strictly limited to delivery functions, however it performs them at high speed over nearly continental areas.

Robot	Hits	Locomotion	Speed	TL	Cost
Advanced Courier	12	Grav	—	12	Cr120000
Skills	Athletics (dexterity) 1, Athletics (endurance) 1, Flyer (grav) 1, Navigation 3				
Attacks	—				
Manipulators	—				
Endurance	72 (12) hours				
Traits	Armour (+4), Flyer (very fast), Small (-1)				
Programming	Basic (locomotion) (INT 4)				
Options	Auditory Sensor, Drone Interface, Navigation System (enhanced), Storage Compartment (5 Slots hazardous material), Transceiver 500km (enhanced), Vacuum Environment Protection, Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

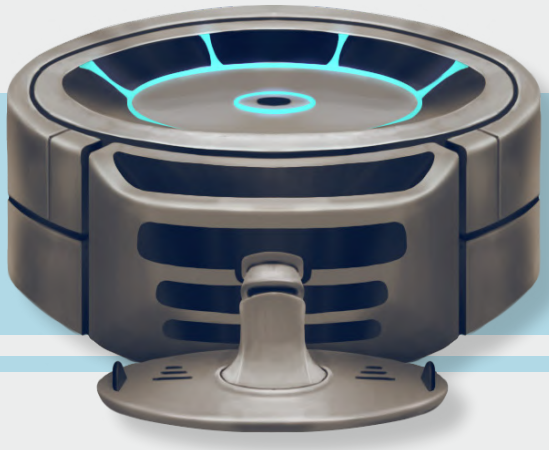
Copyright Mongoose (Order #42562827)

Domestic Servant

The domestic servant robot is a small tracked rounded disk with built-in cleaning apparatus for domestic environments. It can navigate its environment but is not capable of interaction beyond status alarms and pre-recorded messages. These ubiquitous devices are found in many mid- to early stellar-tech homes and offices, operating in the background to keep living and work spaces clean. With no manipulators, the domestic servant requires intervention or connection to a domestic disposal system to empty its waste collection compartment.

Lab Control Robot, Basic

The basic Lab Control Robot is a small box, table-mounted or installed in a larger control panel. Its Advanced robotic brain allows control of a single drone, usually for testing of drones and robots equipped with a drone interface. The robot's brain has the capacity for one more Bandwidth of skill packages and two Bandwidth 0 skill packages, allowing for customisation. The basic robotic drone controller limits the Remote Ops skill of the robot to 0, making this robot an acceptable lab tool but not flexible.



Robot	Hits	Locomotion	Speed	TL	Cost
Domestic Servant	6	Wheels	4m	8	Cr500
Skills	Profession (domestic cleaner) 2, Recon 1				
Attacks	—				
Manipulators	—				
Endurance	79 hours				
Traits	Armour (+2), Small (-2)				
Programming	Primitive (clean)				
Options	Auditory Sensor, Domestic Cleaning Equipment (small), Recon Sensor (improved), Storage Compartment (4 Slots), Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Basic Lab Control Robot	1	None	0m	12	Cr12000
Skills	Electronics (remote ops) 1, +1 Bandwidth available				
Attacks	—				
Manipulators	—				
Endurance	324 hours				
Traits	Armour (+4), Small (-4)				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, External Power, Robotic Drone Controller (basic), Transceiver 500km (improved), Video Screen (improved), Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Lab Control Robot, Advanced

The advanced Lab Control Robot is a more capable robotic brain box equipped with an advanced robotic drone controller capable of controlling up to eight drones at its full skill level. A basic avatar controller allows it to fully control a robot equipped with an avatar interface and an enhanced swarm controller allows it to enable a swarm to perform up to three separate tasks. Smarter than its basic counterpart, this Lab Control Robot is knowledgeable in the science of robotics, allowing it to conduct independent research or diagnose reasonably complex problems with robotic systems.

Labour Droid

Produced by the billions, the Labour Droid is a replacement for low-skilled workers on many TL10+ worlds. Built as a cheaply replaceable unit, these robots often last little more than 10 years before succumbing to accidents or degradation from overuse, although they can last for decades if properly maintained. Variants perform work from agricultural, domestic, industrial, mining, to simple construction work. The Labour Droid is not equipped with specialised tools but can use tools designed for humanoid hands. Specialised versions with built-in tools and specific skill packages are often sold, however few can compete with the heavily discounted basic model.

Robot	Hits	Locomotion	Speed	TL	Cost
Advanced Lab Control Robot	8	None	0m	12	Cr160000
Skills	Electronics (remote ops) 3, Science (robotics) 2				
Attacks	—				
Manipulators	—				
Endurance	324 hours				
Traits	Armour (+4), Small (-2)				
Programming	Advanced (INT 9)				
Options	Auditory Sensor, Avatar Controller (basic), External Power, Robotic Drone Controller (advanced), Swarm Controller (enhanced), Transceiver 5,000km (enhanced), Video Screen (improved), Voder Speaker, Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Labour Droid	15	Walker	5m	10	Cr5000
Skills	Profession (labourer) 2				
Attacks	—				
Manipulators	2x (STR 9 DEX 6)				
Endurance	72 hours				
Traits	Armour (+3), ATV				
Programming	Basic (labourer) (INT 4)				
Options	Auditory Sensor, Drone Interface, Spare Slots x8, Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

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Low Berth, Advanced

An advanced low berth can provide the functions of both a fast-freezing cryoberth and a standard low berth hibernation chamber in a single unit and can operate without outside medical assistance.

It is a coffin-like machine similar to the low or frozen berths used on spacecraft and fits in a standard low berth mounting. The advanced low berth contains a casing fully protecting the occupant and entire unit from vacuum and hazardous conditions. Two internal arms allow basic placement of the occupant and can assist the occupant in entry, although they lack the ability to pick an occupant off the floor and, once the chamber is sealed, are unable to operate outside its confines.

The main difference between operating modes is that a cryoberth works much faster than a low berth, freezing and preserving its occupant almost instantly, although at some risk. A cryoberth can therefore be used to place a severely injured Traveller into stasis until they receive medical treatment. An internal power system can function for nearly four weeks on its own batteries but a berth is usually connected to a vehicle or ship's power supply.

The onboard robotic brain, while not terribly sophisticated, can provide enough assistance and monitoring to avoid the negative impact of an unskilled operator or unassisted hibernation, greatly enhancing the chances of survival during both the freezing and revival processes. The robot is equipped with a basic medical kit and accepts verbal commands regarding the duration of hibernation or the conditions for revival. The advanced low berth contains a refrigerated storage compartment stocked with common medical drugs, which may include Slow Drug, providing a third option for entering hibernation.

Robot	Hits	Locomotion	Speed	TL	Cost
Low Berth, Advanced	50	None	0m	12	Cr90000
Skills	Medic 2				
Attacks	—				
Manipulators	2x (STR 6 DEX 9)				
Endurance	648 hours				
Traits	Armour (+4), Large (+2)				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Medical Chamber (50 Slots), Medical Chamber Option: Cryoberth (improved), Medical Chamber Option: Low berth (improved), Medikit (improved), Spare Slots x20, Storage Compartment (5 Slots), Storage Compartment (2 Slots refrigerated), Transceiver 5km (improved), Vacuum Environment Protection, Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Low Berth, Grav

The grav low berth is a movable version of the advanced low berth and is capable of operating as a standard TL12 cryo or low berth. The self-propelled berth can follow simple instructions as to course and is compatible with a standard low berth mounting. Capable of more than a day of independent operation, it can be transferred between vehicles and facilities at walking speed. When operating in static configuration, its internal power supply lasts for nearly two full weeks.

Robot	Hits	Locomotion	Speed	TL	Cost
Low Berth, Grav	50	Grav	6m	12	Cr160000
Skills	Medic 2				
Attacks	—				
Manipulators	2x (STR 6 DEX 9)				
Endurance	36 hours				
Traits	Armour (+4), Flyer (idle), Large (+2)				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Medical Chamber (50 Slots), Medical Chamber Option: Cryoberth (improved), Medical Chamber Option: Low berth (improved), Medikit (improved), Spare Slots x4, Storage Compartment (5 Slots), Storage Compartment (2 Slots refrigerated), Transceiver 5km (improved), Vacuum Environment Protection, Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

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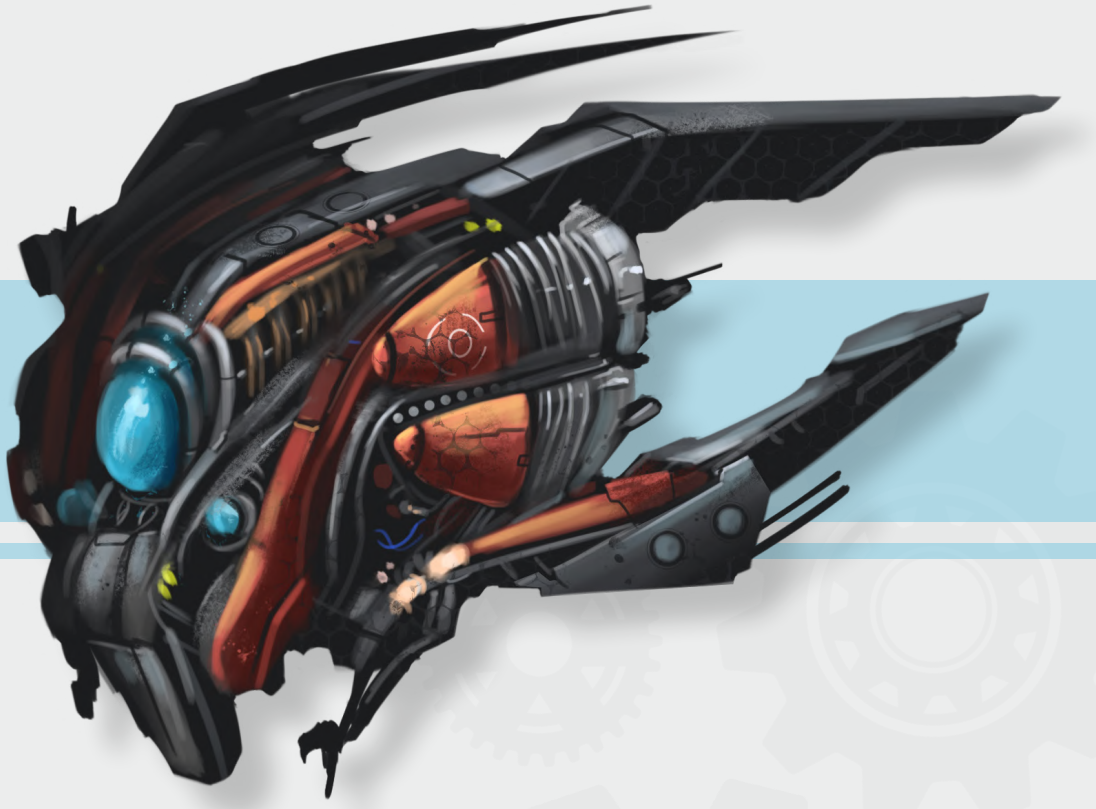
Mining Bot

This is a mining drone with a robot brain inserted to allow it to operate independently. Other than the addition of an Advanced robot brain allowing the robot to operate as a miner and a voder speaker to allow it to communicate verbally, it is identical in construction and appearance to a mining drone. Capable of autonomous operation and smart enough to recognise economically viable ore from worthless rock, it lacks the sensors and skills to prospect independently.



Robot	Hits	Locomotion	Speed	TL	Cost
Mining Bot	50	Thruster	—	12	Cr250000
Skills	Athletics (endurance) 3, Athletics (strength) 2, Profession (mining) 2				
Attacks	—				
Manipulators	1x (STR 12 DEX 7)				
Endurance	18 (5) hours + Solar Coating (enhanced)				
Traits	Armour (+10), IR/UV Vision, Large (+2), Thruster (1G)				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Drone Interface, Mining Equipment (large), PRIS Sensor, Solar Coating (enhanced), Transceiver 5,000km (enhanced), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Robodiver

Robodivers are expensive human-sized robots capable of operating at crushing depths beneath the ocean. They are typically used for repair operations, although are capable of rudimentary reconnaissance roles too. They are equipped with two manipulator arms and are extremely robust. On dry land, robodivers can move around on tracks at a slow walking pace but submerged they operate with variable buoyancy and are propelled with a series of ducted props.

RPRU

The Remotely Piloted Reconnaissance Unit, often known as the Sphere-Eye, is a half-metre sphere studded with lenses, microphones and detection devices. It is often operated as a drone but has limited evasion capabilities to allow independent flight in the event of communications disruption. The gravitic probe reaches 200 kilometres per hour in regular flight and 60 kilometres per hour in nap-of-the-earth flight out to a communications range of approximately 30 kilometres. For close-in communications, an encrypted maser communications link allows for nearly undetectable transmissions.

The RPRU is programmed and operated through the Control and Reception Unit (CRU). This ruggedised advanced drone control console consists of a control panel and three fold-out display screens. The CRU is carried in a small and rugged attaché case. It weighs three kilograms and costs Cr15000, while the RPRU weighs 12 kilograms. The Cr33000 price for the RPRU includes a charging station and maintenance tools.

Robot	Hits	Locomotion	Speed	TL	Cost
Robodiver	40	Aquatic, Tracks	4m	11	Cr222000
Skills	Mechanic 2, Melee 0, Profession (diving) 3, Recon 1				
Attacks	Claw (3D)				
Manipulators	2x (STR 12 DEX 9)				
Endurance	65 hours				
Traits	Armour (+4), ATV, IR Vision, Large (+1)				
Programming	Advanced (INT 7)				
Options	Auditory Sensor, Cutting Torch (improved), Drone Interface, Light Intensifier Sensor (advanced), Mechanical Toolkit (improved), Recon Sensor (improved), Spare Slots x4, Submersible Environment Protection 600m (enhanced) x4, Transceiver 500km (enhanced), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
RPRU	6	Grav	—	11	Cr33000
Skills	Athletics (dexterity) 1, Recon 2, Stealth 3				
Attacks	—				
Manipulators	—				
Endurance	24 (6) hours				
Traits	Armour (+4), Flyer (high), Heightened Senses, IR Vision, Small (-2), Stealth (+2)				
Programming	Primitive (evade) (INT 1)				
Options	Auditory Sensor, Camouflage: Audible (advanced), Camouflage: Visual (enhanced), Drone Interface, Encryption Module, Light Intensifier Sensor (advanced), Olfactory Sensor (improved), Recon Sensor (enhanced), Stealth (improved), Tightbeam Communicator, Transceiver 50km (enhanced), Voder Speaker, Wireless Data Link				

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Special Delivery Servitor (SDS)

A product of Spinward Specialities, the Special Delivery Servitor (SDS) is a fast armoured courier robot. Its shiny streamlined surface can maintain subsonic flight for up to 14 hours covering over 16,000 kilometres – allowing delivery to any point on a planet 10,000 kilometres in diameter and most points on larger worlds if flying within an atmosphere. Suborbital or low orbital travel puts any point on any habitable world within range. The SDS places its Flyer and Navigation skills in its Advanced robot brain's software, not in hardware, allowing it to carry up to eight Slots of cargo in its secure hazardous material-ready cargo bay. With high technology and high cost, the SDS is sometimes sold at a premium, especially as an aggressive advertising campaign by its Mora-based manufacturer has driven up demand for the courier to use 'when it absolutely needs to get there today'.

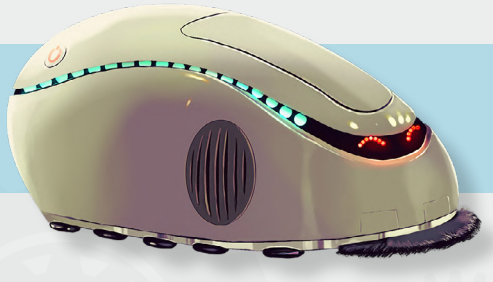
Robot	Hits	Locomotion	Speed	TL	Cost
Special Delivery Servitor	20	Grav	—	15	Cr290000
Skills	Athletics (dexterity) 1, Flyer (grav) 3, Navigation 0				
Attacks	—				
Manipulators	—				
Endurance	96 (14) hours				
Traits	Armour (+16 +10 vs. lasers), Flyer (subsonic), IR/UV Vision				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Drone Interface, Encryption Module, Reflec Armour, PRIS Sensor, Storage Compartment (8 Slots hazardous material), Vacuum Environment Protection, Transceiver 5,000km (advanced), Video Screen (advanced), Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Skitter

The Skitter is a highly efficient autonomous cleaning robot. Its entire flattened half-sphere body is consumed by cleaning equipment, allowing it to clean 50 square metres every hour. With 'sticky' gecko wheels, the tiny robot is not limited to cleaning floors but walls and ceilings too. Many buildings and larger vehicles have one or more Skitters as permanent residents, constantly keeping their interior spaces clean.

Not much bigger than a fist, the Skitter is a prolific cleaning device, mainly limited by a lack of internal capacity for storing waste. A Skitter-patrolled space is usually equipped with many trash receptacles or disposal systems, allowing the Skitter to… skitter… back and forth as it cleans. Able to see in the dark and nearly silent in operation, it operates around the clock, pausing only to recharge every few days.



Smart Probe Bot

The Smart Probe Bot is a variant of the probe drone equipped with an Advanced robot brain to allow for independent operations. With autopilot and navigation functions replaced by the brain and a section of reinforced structure removed, the Smart Probe Bot carries a full planetology sensor suite package to allow independent investigation of local phenomena. The specialised sensors and small sampling bay set the Smart Probe Bot apart from the probe drone but it is built on the same chassis and has similar performance characteristics. The robot retains its drone interface, allowing a remote operator to override the robot brain's control of its body if necessary.

Robot	Hits	Locomotion	Speed	TL	Cost
Skitter	1	Wheels	5m	9	Cr2000
Skills	Profession (domestic cleaner) 2				
Attacks	—				
Manipulators	—				
Endurance	72 hours				
Traits	Armour (+2), IR Vision, Small (-4)				
Programming	Primitive (clean) (INT 1)				
Options	Auditory Sensor, Domestic Cleaning Equipment (medium), Gecko Grippers, Light Intensifier Sensor (advanced), Transceiver 5km (improved), Voder Speaker, Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Smart Probe Bot	20	Grav, Thruster	—	12	Cr200000
Skills	Flyer 0, Investigate 0, Navigation 0, Recon 3, Science (planetology) 1				
Attacks	—				
Manipulators	2x (STR 5 DEX 7)				
Endurance	25-year half-life solar power (72 (18) hours)				
Traits	Armour (+7), Flyer (high), Heightened Senses, IR/UV Vision				
Programming	Advanced (INT 8)				
Options	Atmospheric Sensor, Auditory Sensor (broad spectrum), Drone Interface, Environment Processor, Olfactory Sensor (advanced), Planetology Sensor Suite, PRIS Sensor, Recon Sensor (advanced), Satellite Uplink, Solar Power Unit (improved), Transceiver 5,000km (enhanced), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

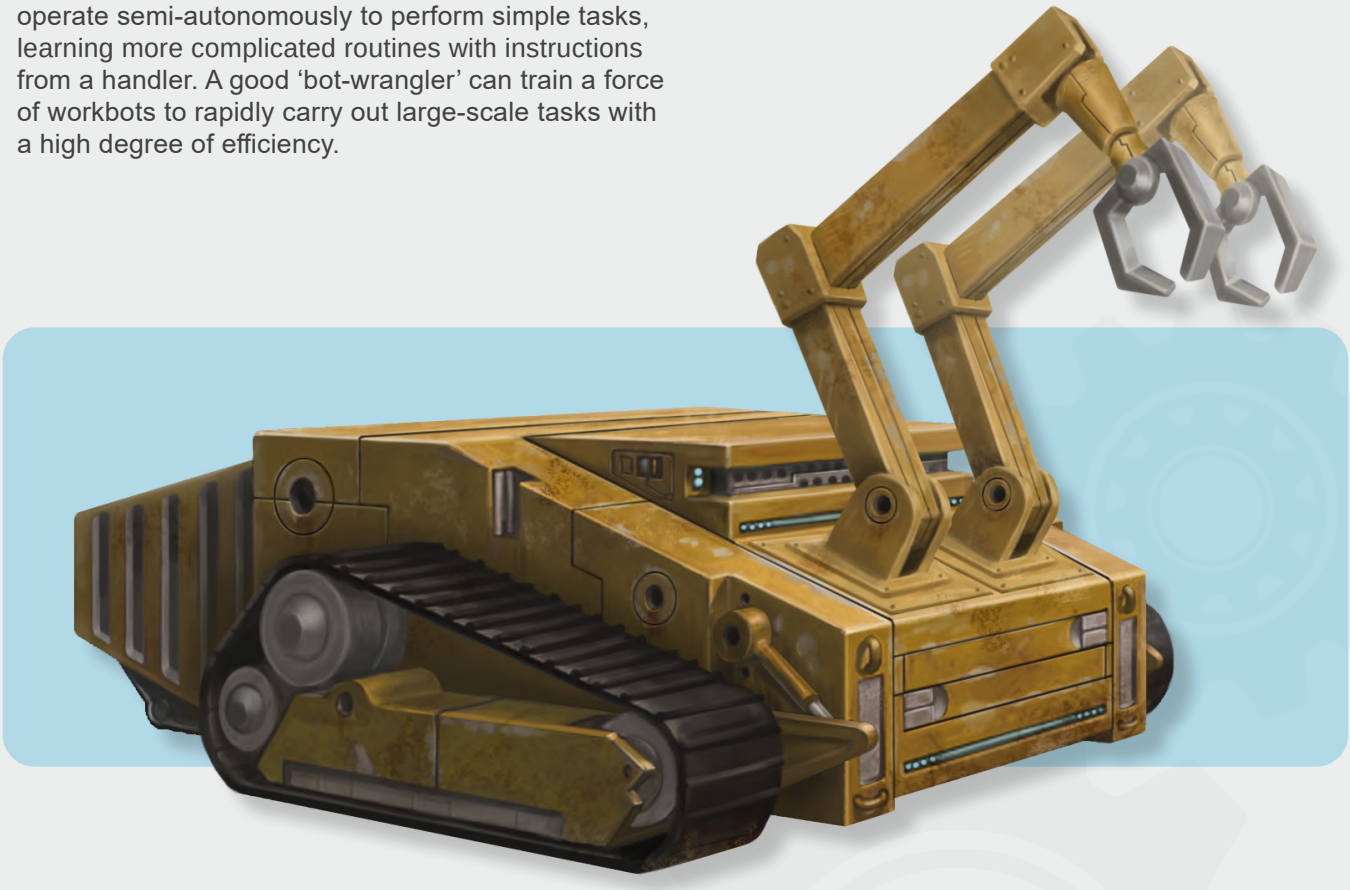
Copyright Mongoose (Order #42562827)

Toolsack Workbot

The Toolsack is a well-respected and widely used unit capable of operating in many environments. It is built on a tracked chassis resembling a small bulldozer and can act as one with the right attachments; a Toolsack can mount a variety of options including a backhoe, heavy-lifting arms, saws, grinders, welding and cutting gear and a set of lighter arms for fine work.

A modular bay on the back of the robot can be used for various applications including shaping logs, force-drying organic matter, sorting ore chunks or even small-scale fabrication work if optional machinery is installed. Workbots of this size are typically used for heavy tasks like construction or earthmoving, and can operate semi-autonomously to perform simple tasks, learning more complicated routines with instructions from a handler. A good 'bot-wrangler' can train a force of workbots to rapidly carry out large-scale tasks with a high degree of efficiency.

Workbots are programmed with inhibitors that prevent them harming humans; even stupid ones who stand in front of a cutting arm. Accidents have happened but these units have an excellent safety and efficiency record. Workbots are also traffic-legal for autonomous operation on the highways of most cities. They are powered by powerful fuel cells with a variety of electrical and mechanical power take-offs and can function as the power source for a collection of smaller robots. It is not uncommon to see a 'bot gang' riding in the Toolsack's configurable bay on the way to a job, all plugged into its power outlets, arriving charged and ready to go.



Robot	Hits	Locomotion	Speed	TL	Cost
Toolsack Workbot	50	Tracks	4m	9	Cr96000
Skills	Athletics (endurance) 3, Mechanic 0				
Attacks	—				
Manipulators	2x (STR 7 DEX 6)				
Endurance	576 hours				
Traits	Armour (+8), ATV, Large (+2)				
Programming	Basic (none) (INT 3)				
Options	Auditory Sensor, Construction Equipment (large), Drone Interface, Spare Slots x20, Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

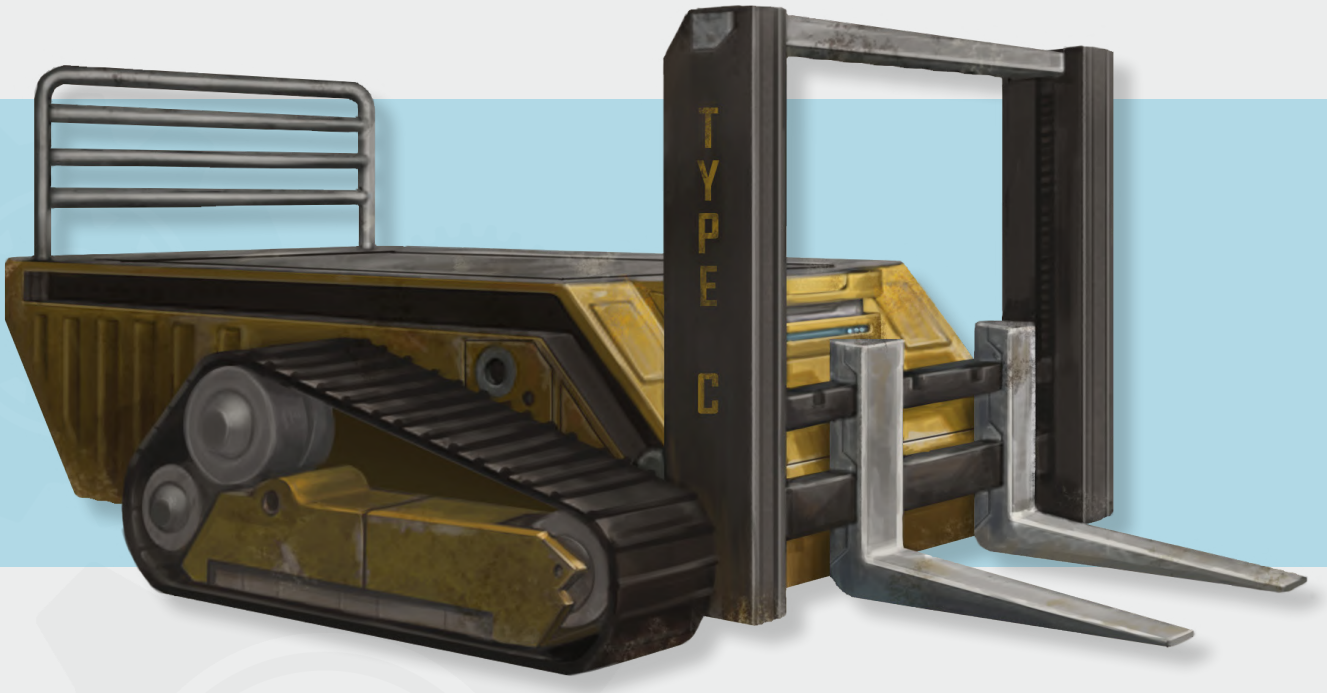
Conny Delshagen (Order #42562827)

Type C Cargo Loader

The Type C is used in numerous ports and carried by commercial starships. It is not uncommon to encounter a fleet of these robots in a down-at-heel starport, where they have been kept working by cannibalising other units.

This robot runs on heavy-duty tracks optimised for smooth surfaces but they do have some rough-ground capability. This enables loading and unloading under frontier conditions away from a starport, which makes these robots popular with crews trading around backwaters. The body of the robot is a blocky, low flatbed with a pair of forklift-type probes on a movable platform. These slide under a container and lift it, then slide back along the bed to deposit the cargo on the main carrying surface. A pair of light manipulator arms are used for smaller items.

Control is either by way of a handset or limited autonomous operation. An operator is required to set up a loading sequence or direct the robot where to take its cargo, with the unit making decisions for route and speed. This semi-autonomous operation allows some users to convert their cargo loaders to other uses; field support conversions are not uncommon, using the loader's admittedly limited cross-country capability to transport spares, supplies and the like. Frontier ranches sometimes use loaders to carry logs or fence-repair stores and might have ingenious improvised devices attached.



Robot	Hits	Locomotion	Speed	TL	Cost
Type C Cargo Loader	26	Tracks	3m	10	Cr28000
Skills	Mechanic 0, Steward 0				
Attacks	—				
Manipulators	2x (STR 9 DEX 6)				
Endurance	76 hours				
Traits	Armour (+0), ATV, Large (+2)				
Programming	Basic (service) (INT 4)				
Options	Auditory Sensor, Drone Interface, Forklift (large), Spare Slots x17, Transceiver 500km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

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ALIEN ROBOTS

In Charted Space, cultures outside the Third Imperium have varying approaches to robotic sciences and differing restrictions and opinions on the roles of robots in their societies. While no species has a truly monolithic philosophy of robots, major tendencies influence design aesthetics and robot functions. The following are representative views of robotics among the Major Races and examples of robots commonly found within their cultures.

ASLAN

The Aslan have near universally defined gender roles and their approach to robotics is shaped by that culture. The science and engineering of robotics is a female role and males consider robots to be unworthy of conducting male tasks. The only exceptions to this divide are medical robots who are considered non-combatants on the battlefield and worker robots who conduct tasks relegated to the lowest rungs of society, such as manual labour.

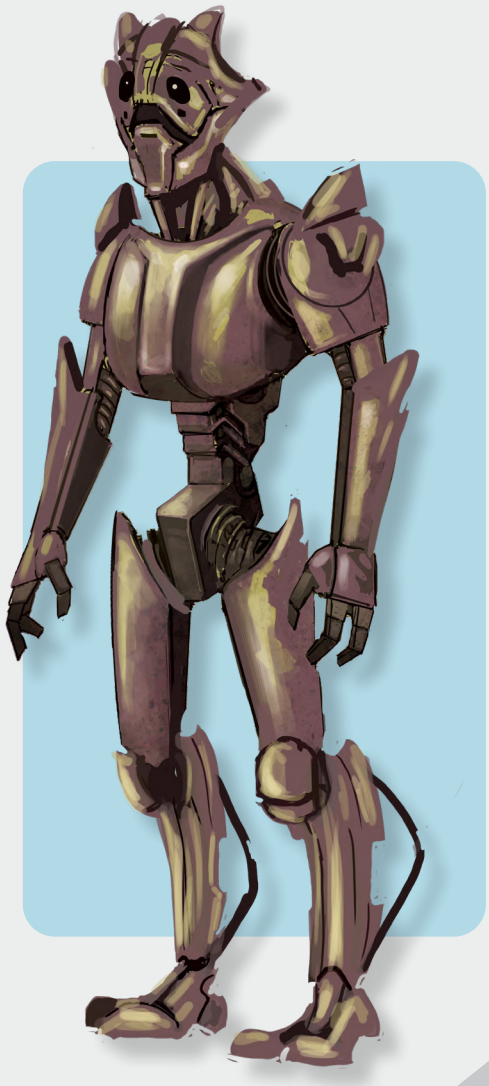
Females use robots as expert assistants, sometimes supplanting the female role in small *ihatei* scout ships and battlefield support technician tasks. Others serve as lab assistants, clerks and other support personnel under female supervision. Limited to TL14 construction, Aslan robots are not as advanced as those produced by some species but they are generally well made and aesthetically suited to their roles. The Aslan firm Tlektaowa was originally the official robot supplier to the Tlaukhu clans and remains a major robot producer of some prestige.

Aslan do not build androids in any large number, perhaps as fallout from the Cultural Purge and experiments among 'deviant' clans; those that do exist tend to be experimental models built by roboticists.

Arerl Slave Machine

These are humanoid robots, mass-produced and used as labourers. The Aslan could perhaps have developed more efficient non-humanoid designs but the *arerl* appeals to some atavistic instinct in the Aslan.

Robot	Hits	Locomotion	Speed	TL	Cost
Arerl	36	Walker	4m	12	Cr45000
Skills	Athletics (strength) 3, Profession (labourer) 2				
Attacks	—				
Manipulators	2x (STR 15 DEX 7)				
Endurance	119 hours				
Traits	Armour (+6), ATV, Large (+1)				
Programming	Basic (labourer) (INT 4)				
Options	Auditory Sensor, Drone Interface, Spare Slots x16 Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				



Conny Delshagen (Order #42562827)

Hikare' Technician

A personal robot of great sophistication, the *hikare'* is capable of serving as an engineer on a one-man scout ship or as a personal servant. On larger ships, they are used to replace or aid female crew members. The *hikare'* design has evolved over time and older *hikare'* are often encountered on backwater Aslan colonies. These robots are equipped with functioning, although limited, grav drives and complete technical and engineering toolkits.

Khyeseir Mousebot

These little drones are mobile food carriers, designed to remind Aslan of natural prey on Kusyu. They are used where live food would be impractical. Freshly heated meat is attached to the *khyeseir's* spikes and the drone is released to run around the dining area.

Robot	Hits	Locomotion	Speed	TL	Cost
Hikare'	23	Grav, Walker	6m	14	Cr590000
Skills	Electronics (computers) 2, Electronics (sensors) 2, Engineer (all) 2, Mechanic 2, Steward 2				
Attacks	—				
Manipulators	2x (STR 9 DEX 8) 1x (STR 6 DEX 9)				
Endurance	36 hours				
Traits	Armour (+4), ATV, Flyer (Idle), IR/UV Vision				
Programming	Very Advanced (INT 11)				
Options	Auditory Sensor, Drone Interface, Electronics Toolkit (advanced), Mechanical Toolkit (advanced), PRIS Sensor, Starship Engineer Toolkit (advanced), Transceiver 500km (advanced), Voder Speaker, Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Khyeseir	3	Walker	10m	8	Cr500
Skills	Athletics (dexterity) 1, Recon 1, Stealth 2				
Attacks	—				
Manipulators	—				
Endurance	36 hours				
Traits	Armour (+2), ATV, Small (-3)				
Programming	Primitive (evade) (INT 1)				
Options	Auditory Sensor, Recon Sensor (improved), Visual Spectrum Sensor, Wireless Data Link				

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HIVER

The Hive Federation is a polity comprised of many sophont species but dominated by Hivers. Hivers would rather manipulate others to perform tasks than do something themselves and this includes building robots to conduct everything from construction to trade to warfare.

Hivers are six-limbed low-slung mostly symmetrical beings and their robots often take a similar shape, with flexible tentacle-like limbs performing both locomotion and manipulation. Robots in the Federation are widespread and almost always produced with high technology components and brains capable of competently handling a variety of tasks. Hivers are perfectly comfortable with having robots fight battles for them and other than compliance with weapons regulations similar to those sold to biological beings, the Hive Federation imposes no special restrictions on warbot operations or sales. The robots built by Six Eyes Nest have a reputation for being especially effective in combat, deadly enough to be prohibited for importation into the Imperium.

Hiver robots are priced in accordance with their premium quality and available for export sale but the distribution of Hiver products far beyond the borders of the Federation are limited by distance. Star Patterns Trading is a major exporter of quality robots.

Gardener Servant

The Gardener is poorly named in that it performs much more than simple gardening tasks. It is a general servant robot for a Hiver who does not want to make the effort to manipulate a biological being into doing its bidding. The Gardener is a six-limbed robot somewhat smaller than an adult Hiver with both manipulator and locomotive capabilities on all six limbs. It can tend a garden, but can also cook, clean and perform medical and veterinary procedures. For cultural reasons these robots are rarely used to clean or maintain the Hiver's burrow-like homes.

The Gardener has no voder installed and communicates via gesture or transceiver, but has acute hearing, a wide spectrum visual sensor array and sophisticated olfactory sensors. The robot has no offensive capabilities, though some can be taught to defend themselves with marginal efficiency if attacked. Rumours of assassin droids disguised as Gardeners are completely unsubstantiated.

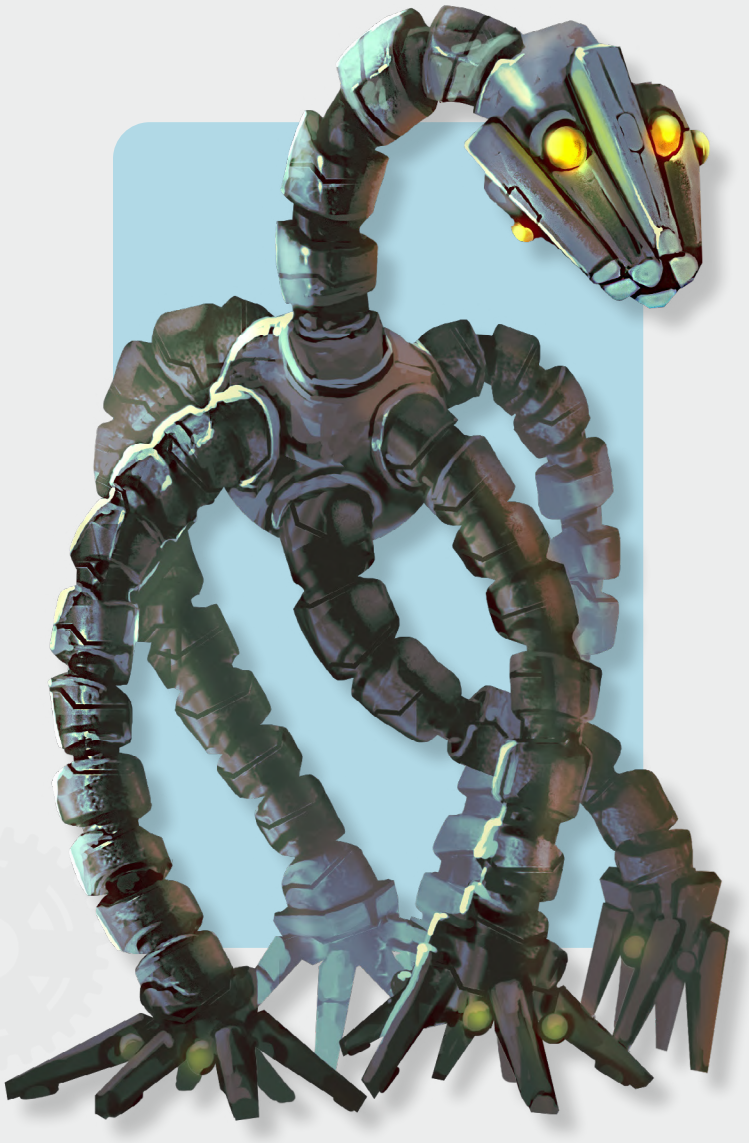
Robot	Hits	Locomotion	Speed	TL	Cost
Gardener Servant	20	Walker	6m	15	Cr85000
Skills	Animals (veterinary) 2, Medic 2, Profession (cleaning) 2, Profession (gardening) 2, Steward 2				
Attacks	—				
Manipulators	4x (STR 9 DEX 9), 2x Manipulator legs (STR 9 DEX 9)				
Endurance	130 hours				
Traits	Armour (+4), ATV, Heightened Senses, IR/UV Vision				
Programming	Advanced (INT 9)				
Options	Agricultural Equipment (small), Auditory Sensor (broad spectrum), Autobar (enhanced), Autochef (enhanced), Domestic Cleaning Equipment (small), Drone Interface, Medikit (enhanced), Olfactory Sensor (advanced), PRIS Sensor, Storage Compartment (3 Slots refrigerated), Transceiver 5km (improved), Wireless Data Link				

Conny Delshagen (Order #42562827)

Hazardous Environment Scout

A large lumbering six-limbed robot capable of long-term operations in environments from vacuum to insidious to radioactive, the Hazardous Environment Scout looks like a Hiver with armour plating. Capable of using all six limbs as manipulators and equipped with gecko grippers and advanced sensors on its extremities, the robot can operate for years in most environments and survive up to two weeks in the most insidious of atmospheres.

The scout has onboard mining and sampling equipment and can transmit data to an orbiting relay satellite or ship. It is too expensive to be disposable but generally does not survive past its three-year RTG operating half-life as it is sent into environments too hazardous for biological beings to work.



Robot	Hits	Locomotion	Speed	TL	Cost
Hazardous Environment Scout	32	Walker	5m	15	MCr2.6
Skills	Navigation 3, Profession (mining) 2, Recon 3, Science (planetology) 2				
Attacks	—				
Manipulators	4x (STR 12 DEX 12), 2x Manipulator legs (STR 12 DEX 12)				
Endurance	3-year half-life (144 hours)				
Traits	Armour (+12), ATV, Heightened Senses, IR/UV Vision, Large (+1)				
Programming	Advanced (INT 8)				
Options	Auditory Sensor (broad spectrum), Corrosive Environment Protection, Drone Interface, Gecko Grippers, Insidious Environment Protection, Laser Designator, Mining Equipment (small), Navigation System (enhanced), Olfactory Sensor (improved), PRIS Sensor, Radiation Environment Protection (+750 rads), Recon Sensor (advanced), RTG Short Duration (basic), Satellite Uplink, Scientific Toolkit (enhanced), Self-Maintenance Enhancement (basic), Storage Compartment (1 Slot hazardous material), Transceiver 5,000km (advanced),Vacuum Environment Protection, Wireless Data Link				

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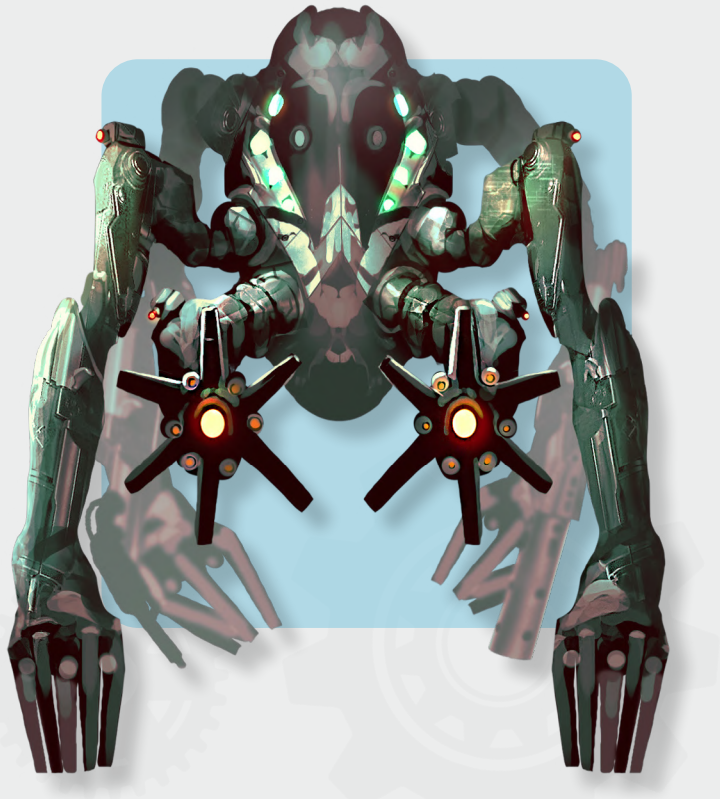
Marine Boarding Droid

Hivers tend to avoid combat, allowing other species of the Federation, such as the Ithklur, to fight for them. In instances where other species are not available or manipulatable, the Hive Federation employs combat robots. The fearsome Marine Boarding Droid, produced by Six Eyes Nest, is well suited for ship boarding actions, able to use all six limbs and selective adhesive surfaces to operate in both zero and high gravity environments with ease.

The Marine Boarding Droid is a six-limbed robot vaguely reminiscent of the shape of a Hiver. It has no head and advanced visual sensors are installed in bands at the end of each limb, just below the six opposable fingers. More oval than a Hiver and able to stand on two or four limbs, emulating a humanoid or centaur stance, the 'forward' two limbs carry powerful ranged weapons that fire through the 'palm' of each limb. One limb holds a heavy gauss support weapon, the other a stagger laser rifle. Dual fire control systems allow both of these ranged weapons to fire simultaneously at differing targets. The 'forearms' of the 'middle' two limbs are equipped with retractable arc-field weapons, high tech plasma versions of a dewclaw, able to cut through bulkhead material and heavy armour. If these weapons are not enough to penetrate a barrier, the back 'legs' include integral cutting torches in their 'palms'.

Additional sensors are distributed across the large oval body. The entire robot is covered in gecko gripper material, allowing Van der Waals force adhesions to most surfaces. Camouflage includes visilight technology to render the robot nearly invisible, even at short ranges, and advanced audible and olfactory camouflage as well as anti-sensor stealth coatings and shielded electronics. The robot can appear fearsome to intimidate foes but becomes effectively invisible to set up an ambush or assassination.



Robot	Hits	Locomotion	Speed	TL	Cost
Marine Boarding Droid	32	Walker	9m	15	Cr550000
Skills	Athletics (dexterity) 2, Athletics (strength) 2, Gun Combat (energy) 3, Gun Combat (slug) 3, Melee (all) 2, Recon 3, Stealth 4, Tactics (military) 2				
Attacks	Arc-Field Weapons x2 (5D+2, AP 30), Hiver Gauss Support Weapon (8D, Auto 2, Blast 2 or AP8), Stagger Laser Rifle (5D+3, Auto 3, Zero-G)				
Manipulators	2x (STR 12 DEX 12), 2x (STR 12 DEX 9), 2x Manipulator legs (STR 12 DEX 9)				
Endurance	230 hours				
Traits	Armour (+28), ATV, Heightened Senses, IR/UV Vision, Large (+1), Stealth (+4)				
Programming	Advanced (INT 8)				
Options	Auditory Sensor (broad spectrum), Camouflage: Audible (advanced), Camouflage: Olfactory (advanced), Camouflage; Visual (superior), Cutting Torches (advanced) x2, Drone Interface, Encryption Module, Fire Control Systems (enhanced) x2, Gecko Grippers, Olfactory Sensor (advanced), PRIS Sensors x6, Radiation Environment Protection (+750 Rads), Recon Sensor (advanced), Stealth (advanced), Tightbeam Communicator, Transceiver 500km (advanced), Vacuum Environment Protection, Voder Speaker (broad spectrum), Weapon Mounts (small) x2, Weapon Mounts (medium) x2, Weapon Mount Autoloader (medium), Wireless Data Link				

Conny Delshagen (Order #42562827)

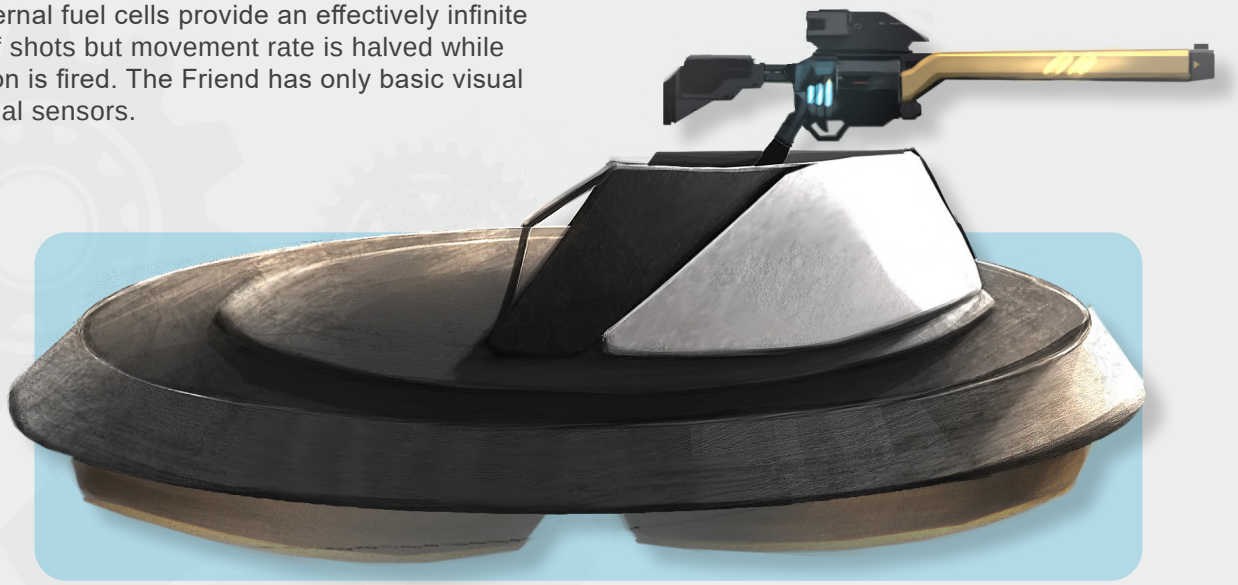
K'KREE

Robots are ubiquitous among the K'kree for tasks not suitable for them due to size or isolation issues. Robots are considered tools like any other and the K'kree do not seem afraid that robots might rise up against them or threaten their civilisation. Robots are not meat-eaters and K'kree are convinced of their own superiority. They give little heed to the thought that robots might one day supplant them. Nevertheless, their robots tend to have simple brains and limited scope; they are expendable machines.

Produced in large quantities to standardised designs, K'kree robots are inexpensive compared to equivalent models in other regions of space. Costs are generally one third to one half of equivalent robots but robots are often bought by Steppelords in large lots. Even the smaller models of military robots are produced in quantities that incorporate this level of discount. As robots are owned by clans and larger groupings, there are few restrictions on their purchase and use.

Friend of the Lowly

The Friend is the most basic of K'kree weapons carriers, using the same ovoid body shape as most others, with a laser rifle along the main axis. The unit is neither agile nor quick and cannot keep up with a band of charging K'kree if firing at the same time but does provide accurate light fire support on the move. Internal fuel cells provide an effectively infinite number of shots but movement rate is halved while the weapon is fired. The Friend has only basic visual and thermal sensors.



Robot	Hits	Locomotion	Speed	TL	Cost
Friend of the Lowly	20	Grav	12m	10	Cr25000
Skills	Gun Combat 0, Recon 0				
Attacks	Laser Rifle (5D, Zero-G)				
Manipulators	—				
Endurance	10 hours				
Traits	Armour (+12), Flyer (idle), IR Vision				
Programming	Hunter/Killer (standard) (INT 4)				
Options	Auditory Sensor, Thermal Sensor, Transceiver 5km (improved), Voder Speaker, Weapon Mount (medium),Wireless Data Link				

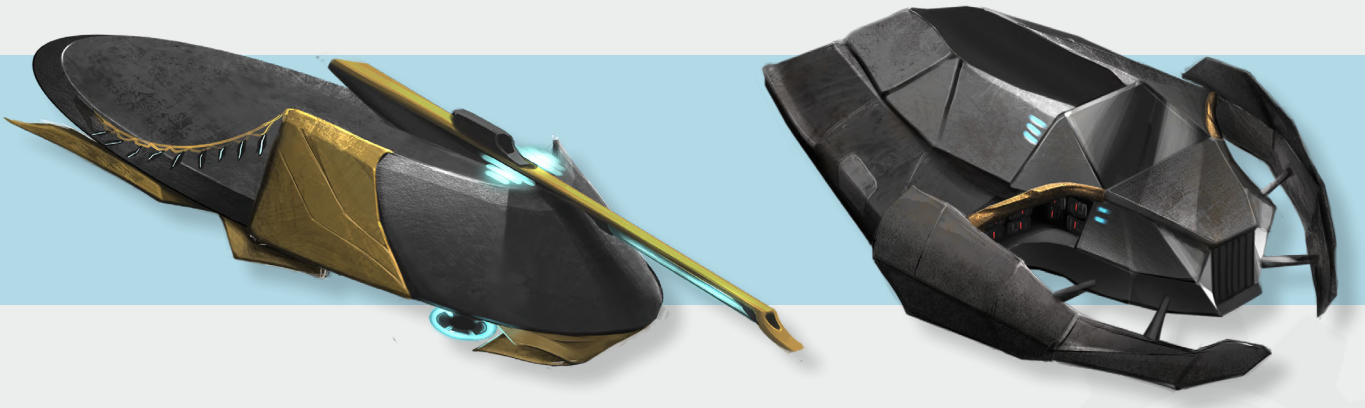
Comity Bookmarks (Order #42562827)

Distant Lance

The Distant Lance is an inexpensive fire support unit, physically little different from the Friend but much more richly decorated. It carries a laser rifle like that of the Friend but has much better sensors and targeting equipment, and is often programmed to move slowly behind a band, acting as a sniper to take out enemy heavy weapons emplacements.

Opener-of-the-Way

The Opener is a specialist unit without offensive weaponry, running into a target to deliver obstacle-clearing explosives. These include small charges dropped onto obstacles and spools of explosive wire, which are then detonated to clear a path through a minefield, barbed wire or similar obstacles. A path two metres wide by 100 metres long can be cleared, or multiple shorter sections, and there are enough charges aboard to clear 12 light obstructions such as barricades or metal fences.



Robot	Hits	Locomotion	Speed	TL	Cost
Distant Lance	28	Grav	12m	10	Cr45000
Skills	Gun Combat (energy) 2, Recon 1				
Attacks	Laser Rifle (5D, Zero-G)				
Manipulators	—				
Endurance	10 hours				
Traits	Armour (+16), Flyer (idle), IR Vision				
Programming	Hunter/Killer (standard) (INT 4)				
Options	Auditory Sensor, Fire Control System (improved), Recon Sensor (improved), Thermal Sensor, Transceiver 5km (improved), Voder Speaker, Wireless Data Link, Weapon Mount (medium)				

Robot	Hits	Locomotion	Speed	TL	Cost
Opener-of-the-Way	28	Grav	12m	10	Cr35000
Skills	Explosives 1, Recon 0				
Attacks	Explosive Charge, Autoloaders x2 (2D, Blast 2)				
Manipulators	—				
Endurance	10 hours				
Traits	Armour (+18), Flyer, (idle), IR Vision				
Programming	Hunter/Killer (standard) (INT 4)				
Options	Auditory Sensor, Fire Control System (basic), Thermal Sensor, Transceiver 5km (improved), Voder Speaker, Weapon Mount (small), Weapon Mount Autoloaders (small) x2, Wireless Data Link				

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Guardian-of-Glory

The Guardian has a set of armoured shields flaring out from its frontal section, creating a mobile position of cover for an advancing warrior band. It is armed with a laser rifle along its main axis and a rapid-fire stagger laser weapon in an ovoid turret well forward on the torso. The effect is intentionally to create the impression of a noble K'kree, cloak flying out to the sides. The turret has all-round firepower; the heavy laser requires pivoting the whole unit and can deprive those behind it of cover when engaging targets to the side. Under normal circumstances the Guardian is set to weave among and ahead of an advancing warrior band, although it can also be commanded to provide cover for a specified individual.

Breaker-of-Lines

The Breaker acts as an artillery unit. It has a rapid-fire laser unit equivalent to a Hand-of-Length for close-in defence but its primary armament is a short-barrelled 112mm mortar, which can deliver explosive munitions. The mortar has an effective range of three km and carries enough projectiles for 12 shots.

Robot	Hits	Locomotion	Speed	TL	Cost
Guardian-of-Glory	35	Grav	10m	12	Cr75000
Skills	Gun Combat (energy) 1, Recon 0				
Attacks	Laser Rifle (5D, Zero-G), Stagger Laser Rifle (5D, Auto 2, Zero-G)				
Manipulators	2x (STR 11 DEX 7)				
Endurance	22 hours				
Traits	Armour (+22), Flyer (idle), IR Vision, Large (+1)				
Programming	Hunter/Killer (standard) (INT 4)				
Options	Auditory Sensor, Fire Control Systems (basic) x2, Thermal Sensor, Transceiver 5km (improved), Voder Speaker, Weapon Mounts (medium) x2, Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Breaker-of-Lines	50	Grav	10 m	10	Cr150000
Skills	Gun Combat 0, Heavy Weapons (vehicle) 1, Recon 0				
Attacks	Hand-of-Length (4D, Auto 4, Zero-G), Support Mortar (9D, Artillery, Blast 6)				
Manipulators	—				
Endurance	14 hours				
Traits	Armour (+16), Flyer (idle), IR Vision, Large (+2)				
Programming	Hunter/Killer (standard) (INT 4)				
Options	Auditory Sensor, Fire Control System (basic), Thermal Sensor, Transceiver 5 km (improved), Voder Speaker, Weapon Mount (medium) Weapon Mount (vehicle), Weapon Mount Autoloader (vehicle), Wireless Data Link				

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Slayer-of-Shields

The Slayer is a direct-fire support unit. It has a rapid-fire stagger laser for close range defence but its main armament is a pair of Weapon-of-Destruction plasma guns carried on stubby arms alongside the main hull. The Slayer normally fires its weapons alternately, allowing a brief cooling period. Both can be fired simultaneously but there is a chance of overheating and malfunction every time this is done. The first time both guns are fired together in the same round, roll 1D. On a 6+, the guns will overheat, requiring realignment and repair, which is a workshop job. A cumulative DM+1 is added to this roll for every consecutive round both plasma guns are fired.

Robot	Hits	Locomotion	Speed	TL	Cost
Slayer-of-Shields	50	Grav	12m	12	Cr200000
Skills	Gun Combat 0, Heavy Weapons (portable) 1, Recon 0				
Attacks	Stagger Laser Rifle (5D, Auto 2, Zero-G), Weapon-of-Destruction x2 (1DD, Very Bulky)				
Manipulators	—				
Endurance	14 hours				
Traits	Armour (+24), Flyer (idle), IR Vision, Large (+2)				
Programming	Hunter/Killer (standard) (INT 4)				
Options	Auditory Sensor, Fire Control Systems (basic) x2, Thermal Sensor, Transceiver 5km (improved), Voder Speaker, Weapon Mount (medium), Weapon Mount (heavy), Wireless Data Link				

Conny Delshagen (Order #42562827)

SOLOMANI

The Solomani have a diversity of opinion when it comes to the acceptance of robots. Some Solomani worlds welcome the use of robots for any task they can perform; others prohibit their use for societal or religious reasons. Most Solomani cultures eschew warbots, relegating robots to support roles in military conflict.

The quality and sophistication of Solomani robots varies greatly but technology is generally limited to TL14. Solomani views towards androids vary but opposition to robots that can 'pass' as human is often strong even among those who have never heard of the Shudusham Concords.

With the exception of Panstellar, most Solomani robot manufacturers are local to their world or subsector, few spanning even one sector of Solomani space. Especially along the trailing frontier, Hiver robots have a strong market share and reputation for quality surpassing most native Solomani designs. Some Solomani worlds consider these robots to be part of a 'Hiver plot' and prohibit their importation.

Confederation Army Ammobot

An ammobot is built on a low tracked chassis, with an ammunition hopper on the back, reloading station in the centre and a magazine dispenser at the front and each side. The hopper holds a single ammunition type and a single magazine type can be accommodated. Usually this is to fit the standard 4mm gauss rifle used by most Confederation Army formations, although ammobots can be quickly reconfigured to operate with other weapons. Some variant types can dispense more than one ammunition type but these are more likely to be in use with SolSec or navy personnel than the army.

The ammobot is lightly armoured and tough. It is capable of automatically moving from a unit's position to a supply dump and back again without getting stuck but that is about the limit of its capabilities. The reloading mechanism holds 20 magazines. As these are taken by soldiers, empty ones can be inserted through a slot in the top of the mechanism. Those too dented for safe use are spat out of another slot as they pass through the mechanism, generally eliciting jeers and humorous insults in non-critical situations. The ammunition hopper holds 24,000 rounds of gauss rifle ammunition, sufficient to reload 300 magazines, and their internal batteries are also charged if they remain in the robot for any length of time. When using larger calibres, such as advanced combat rifle ammunition, capacity is greatly reduced.

Ammobots are widely used in civilian life, repurposed as dispensers of all manner of useful items. A popular vid show of recent years has focussed, on modifying robots and devices; its all-time highest rated episode featured the on-the-go barbecue devised by an independent survey and exploration crew, enabling them to feed samples of local plant and animal life into the robot and enjoy a tasty chargrilled meal on the march.

Robot	Hits	Locomotion	Speed	TL	Cost
Ammobot	20	Tracks	6m	12	Cr7200
Skills	—				
Attacks	—				
Manipulators	2x (STR 9 DEX 7)				
Endurance	86 hours				
Traits	Armour (+4), ATV				
Programming	Basic (none) (INT 4)				
Options	Auditory Sensor, Transceiver 5 km (improved), Visual Spectrum Sensor, Voder Speaker, Weapon Mount Autoloaders (medium) x8, Wireless Data Link				

Comity Bookshelf (Order #42562827)

Confederation Army Mortarbot

Built on a larger chassis than the ammobot but still capable of fitting inside a grav APC or assault shuttle, the mortarbot is armed with a three-barrel breech-loaded smoothbore mortar on a limited-traverse mount. Elevation is more free but the weapon has to return to the vertical for reloading. The three barrels are arranged in a triangular configuration, which rotates to align the breech with the loading mechanism. One barrel can be fired at a time or all three in rapid succession.

Accuracy with standard munitions is unimpressive but the weapon's limited range ensures that deviation is not excessive. Designated and guided payloads are available but for the most part the mortarbot is used to deliver a hail of rapid fire on enemy positions or break up an attack on friendly units. Eighteen bombs are carried in the rear of the robot's chassis, with three more in ready-to-fire positions in the breech.

Mortarbots are sometimes used for non-military applications. Foliage clearance is one common application, on worlds where the local vegetation is hazardous to humans. Firefighting bots can lob chemical warheads into a fire, scattering either foam or particles with a huge heat capacity, effectively drawing the heat out of the fire. A reconnaissance and surveillance variant is also sometimes used, which lobs camera-equipped drones high into the air for local-area mapping. This is inefficient but useful in areas of heavy vegetation or cluttered rocky overhangs.

Robot	Hits	Locomotion	Speed	TL	Cost
Mortarbot	34	Tracks	6m	12	Cr40000
Skills	Heavy Weapons (vehicle) 0				
Attacks	Support Mortar (9D, Artillery, Auto 3, Blast 6)				
Manipulators	2x (STR 11 DEX 7)				
Endurance	86 hours				
Traits	Armour (+4), ATV, Large (+1)				
Programming	Basic (none) (INT 4)				
Options	Auditory Sensor, Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Weapon Mount (vehicle), Weapon Mount Autoloader (vehicle), Wireless Data Link				

Conny Delshagen (Order #42562827)

ROvER

The Robotic Overwatch Enhanced Retriever or ROvER is technically a civilian or security robot offered as a fearsome robotic guard dog on some Solomani worlds. The clearly robotic ROvER looks like a mechanical mix of Doberman and Great Dane. It is about the same size as a human adult and stands chest high. Usually matte black, but available in a limited palette of colours, ROvER is an extremely heavily armoured Hunter/Killer robot with monofilament front claws and razor-sharp teeth that can crush bone or hold a target in place. Equipped with superior sensors and target designating lasers in its red-glowing PRIS eyes, ROvER can find and pinpoint its prey for ranged weapons systems to bring down.

As a last resort ROvER is equipped with an offensive self-destruct system, capable of doing terrible damage in a five-metre radius. For private civilian sales, the self-destruct mechanism is often removed, usually without reducing the price of the robot but allowing it to be legally sold to a broader market. Having a ROvER or two guarding and patrolling your estate is a particularly menacing status symbol. Some SolSec facilities keep a ROvER on site both for its advanced sensory features and to intimidate… everyone. A ROvER is sometimes introduced as a security detail at diplomatic events, especially those including Imperial delegations with Vargr on staff.

Robot	Hits	Locomotion	Speed	TL	Cost
ROvER	20	Walker	12m	12	Cr230000
Skills	Athletics (dexterity) 3, Melee (natural) 2, Recon 3, Tactics (military) 2				
Attacks	Jaw Edging (3D), Monoknife Claw Edging x2 (3D, AP10), Self-Destruct (12D, Blast 5)				
Manipulators	—				
Endurance	130 hours				
Traits	Armour (+40), ATV, Heightened Senses, IR/UV Vision				
Programming	Hunter/Killer (tactical) (INT 4)				
Options	Auditory Sensor (broad spectrum), Drone Interface, Fire Control System (improved), Laser Designator, Olfactory Sensor (advanced), PRIS Sensor, Recon Sensor (advanced), Self-Destruct System: Offensive, Self-Repairing Chassis, Transceiver 50km (enhanced), Vacuum Environment Protection, Voder Speaker, Weapon Mounts (small) x3, Wireless Data Link				

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VARGR

Vargr robotics science and technology is not well advanced, a cultural phenomenon as control over robots does not enhance charisma; in fact, it emphasises the lack of it. Therefore, using or building robots tends to be a low-prestige activity. As with many generalisations about the Vargr Extents, there can be significant variations in robotic quality but, as a rule, Vargr robots are overpriced, badly engineered and have low intelligence.

Vargr robots can cost twice as much as expected. Quality is varied and as with many Vargr products, significant customisation and modification is expected; many designs incorporate spare spaces reserved for customisation. Second-hand robots are common, with mismatched parts, odd modifications and quirky personalities. Vargr tend to use robots in situations that are dangerous or difficult but lack prestige, such as construction and mining, especially in hazardous environments. Robotic vehicles with mundane functions such as buses and trucks are common on such worlds.

Designs near the borders of the Imperium and Zhodani Consulate are influenced by their neighbours. Imports are common but so are counterfeit robots or robots of questionable providence. Vargr corporations such as Eksaekfoer are notorious for producing cheap counterfeits of imported models.

Advisor Robot

This small robot is primarily used in an advisory role by corporations and merchants; it can be consulted on all matters pertaining to bureaucracy, law and trade.

Robot	Hits	Locomotion	Speed	TL	Cost
Advisor Robot	8	Tracks	3m	13	Cr125000
Skills	Admin 2, Advocate 2, Broker 1				
Attacks	—				
Manipulators	2x (STR 5 DEX 8)				
Endurance	119 hours				
Traits	Armour (+3), ATV, Small (-2)				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Spare Slots x4, Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

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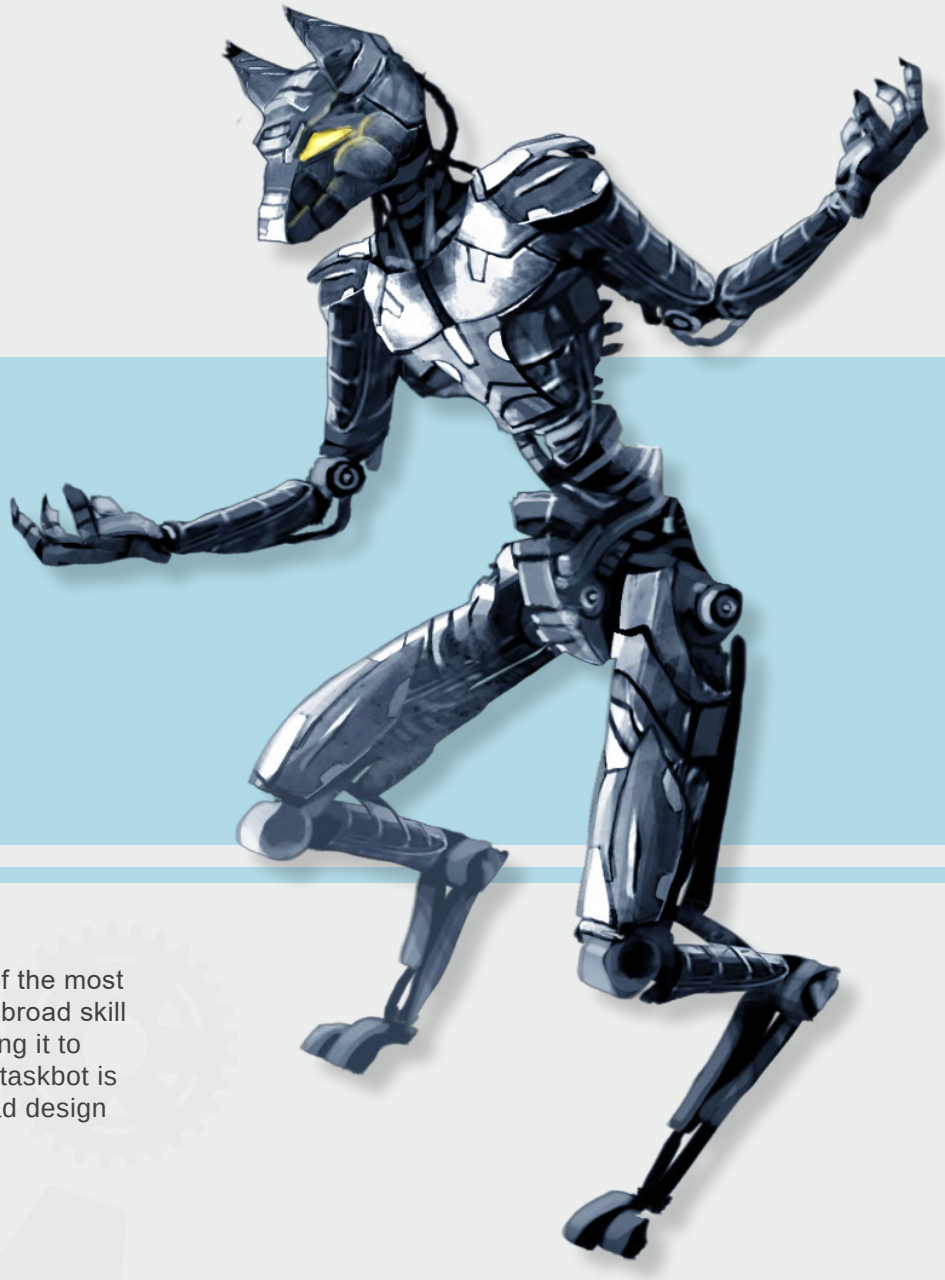

Taskbot

This general-purpose robot is one of the most advanced robots of Vargr design. A broad skill set is included with this robot allowing it to perform a wide range of tasks. The taskbot is humanoid in appearance with a head design based on Vargr physiology.

Robot	Hits	Locomotion	Speed	TL	Cost
Taskbot	26	Walker	5m	12	Cr30000
Skills	Admin 0, Advocate 0, Art 0, Broker 0, Drive 0, Electronics 0, Mechanic 0, Medic 0, Navigation 0, Survival 0				
Attacks	—				
Manipulators	2x (STR 9 DEX 7)				
Endurance	108 hours				
Traits	Armour (+4), ATV				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Spare Slots x8, Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

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ZHODANI

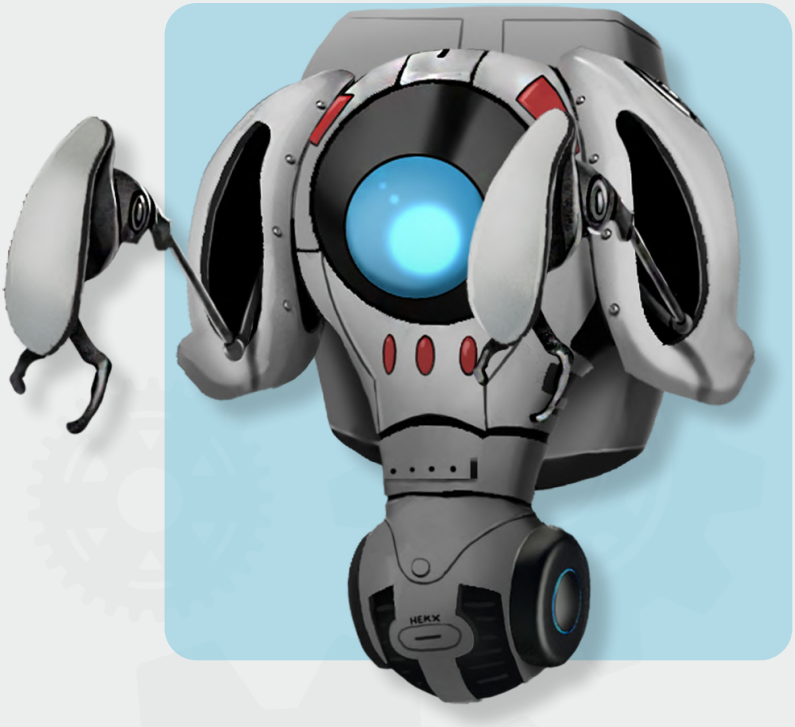
The Zhodani commonly use robots for both civilian and military tasks, and do not have the fear of autonomous war machines that is ingrained in Imperial culture. Neither do the Zhodani have a need to make their robots humanoid in appearance, instead favouring a grav-powered legless torso, although still commonly equipped with a rotating head and two manipulators.

Widespread use of robots reduces production costs. Many robots are produced in sufficient quantities to cut costs in half. Major manufacturers include the industrial combine Chiadle, Ibr Ajklia Driachobl (IAD) – which is also known for its excellent software and computers – and the heavy industry firm Tliazhashal.

Zhodani robots are limited to TL14 and tend to have the simplest brain available for their role. Zhodani do not focus on artificial intelligence, nor do they produce androids. Many Zhodani robots include the psionic equivalent of a drone interface, allowing simple direction, control or shutdown of a robot by telekinetically 'flipping' switches within the robot's brain.

Trashbot

This trashbot is commonly used by the Zhodani government and nobility. Wandering around a commercial or civic area, it continually picks up waste and stores it in a receptacle carried within. When full, the robot dumps it at a local disposal location, then returns to trash patrol. The janitorial toolkit includes a collection of tools for sweeping, dusting, polishing and vacuuming, as well as static charge dissipaters and assorted mechanical cleaning aids. This toolkit also allows the robot to instantly shred most materials fed into it. This ability makes the robot ideal for information security applications and it can be found in many Zhodani government offices.



Robot	Hits	Locomotion	Speed	TL	Cost
Trashbot	16	Grav	6m	11	Cr8000
Skills	Profession (domestic cleaner) 2, Recon 2				
Attacks	—				
Manipulators	2x (STR 5 DEX 7)				
Endurance	24 hours				
Traits	Armour (+1), Flyer (idle), Small (-1)				
Programming	Primitive (clean) (INT 1)				
Options	Auditory Sensor, Industrial Cleaning Equipment (small), Recon Sensor (enhanced), Storage Compartment (4 Slots) Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

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Maintenance Bot

The maintenance bot has a cylindrical body with two arms ending in complex tool-hands and a small wedge-shaped head turret, and relies on its grav system for mobility. Manufactured by Chiadle, it is the most common general-purpose repair and maintenance robot used in Zhodani space. It can be seen at starports and aboard merchant or naval vessels, often negating the need for a dedicated maintenance crewman. It comes in several versions, mostly differing in the kind of tool systems used.

Robot	Hits	Locomotion	Speed	TL	Cost
Maintenance Bot	20	Grav	6m	12	Cr16000
Skills	Mechanic 1, Recon 1, +1 Bandwidth available				
Attacks	—				
Manipulators	2x (STR 9 DEX 7)				
Endurance	36 hours				
Traits	Armour (+4), Flyer (idle)				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Mechanical Toolkit (improved), Recon Sensor (improved), Spare Slots x10, Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

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Light Warbot

This warbot is light enough to be carried as equipment by a Zhodani commando team – massing a total of nine kilograms, a skilled teleporter can even carry one with them when they teleport. A favourite tactic of Zhodani commandos is to teleport deep into enemy territory, leave several light warbots behind and then teleport back to safety while the warbots wreak havoc on an unsuspecting encampment, thoroughly demoralising the enemy.

Robot	Hits	Locomotion	Speed	TL	Cost
Light Warbot	12	Grav	—	11	Cr45000
Skills	Gun Combat (slug) 1, Melee 0, Recon 2, Stealth 1				
Attacks	Claw (2D), Submachinegun (3D, Auto 3)				
Manipulators	2x (STR 7 DEX 7)				
Endurance	24 (6) hours				
Traits	Armour (+3), Flyer (high), Small (-1), Stealth (+1)				
Programming	Advanced (INT 7)				
Options	Auditory Sensor, Recon Sensor (enhanced), Stealth (basic), Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Weapon Mount (medium), Wireless Data Link				

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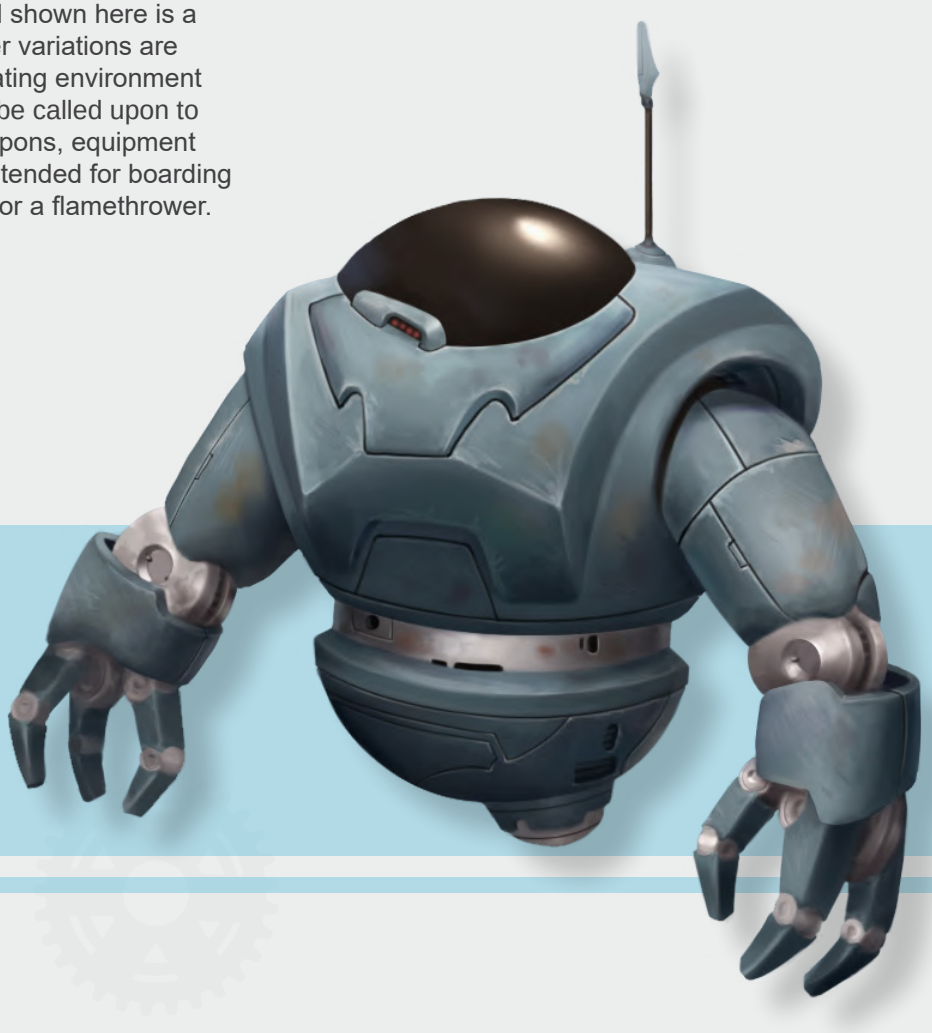
Medium Warbot

This design is a popular warbot model, with customised versions in use throughout the Consulate. The warbot is solid and reliable, with good intelligence (as far as Zhodani robots go). The model shown here is a basic configuration but many other variations are available, depending on the operating environment or type of mission the warbot will be called upon to perform, carrying a variety of weapons, equipment and additional armour. Warbots intended for boarding actions often swap the laser rifle for a flamethrower.



Robot	Hits	Locomotion	Speed	TL	Cost
Medium Warbot	20	Grav	—–	12	Cr45000
Skills	Gun Combat (energy) 2, Melee 0, Recon 1, Tactics (military) 1				
Attacks	Claw (3D), Laser Rifle (5D+3, Zero-G)				
Manipulators	2x (STR 9 DEX 7)				
Endurance	36 (9) hours				
Traits	Armour (+8), Flyer (high)				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Recon Sensor (improved), Spare Slots x6, Transceiver 5km (improved), Vacuum Environment Protection, Visual Spectrum Sensor, Voder Speaker, Weapon Mount (medium), Wireless Data Link				

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Heavy Warbot

This warbot is designed to hold its own in a full-frontal assault involving armoured troops with fusion and plasma weapons. Although hugely expensive, it stands up well in the most demanding battlefield situations. Besides obvious offensive uses, it works well as a defensive warbot or forward scout, with its excellent sensors. The oblong half-dome chassis body presents a small frontal profile, thus minimising available targeting area, while the small rotating head contains the sensory and firing apparatus for the fusion weapon, allowing the main chassis to remain behind cover while firing.

Robot	Hits	Locomotion	Speed	TL	Cost
Heavy Warbot	20	Walker	6m	14	Cr200000
Skills	Heavy Weapons (portable) 3, Melee 0, Recon 2, Tactics (military) 1				
Attacks	Claw (3D), FGMP-14 (2DD Radiation, Very Bulky)				
Manipulators	2x (STR 9 DEX 8)				
Endurance	97 hours				
Traits	Armour (+22), ATV, Heightened Senses, IR Vision,				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Environment Processor, Recon Sensor (enhanced), Thermal Sensor, Transceiver 500km (advanced), Voder Speaker, Weapon Mount (heavy), Wireless Data Link				

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Drones

While drones may have some basic autopilot and navigation features, they do not have sophisticated independent decision-making routines. They are designed to be operated remotely using the Electronics (remote ops) skill. As such, they do not have skills but options may provide modifiers to various tasks performed by their operators or place limitations on those tasks if the drone's equipment is inadequate. Drone equipment is listed in the skills column to indicate the innate capabilities of the drone, usable by the operator.

Courier Drone

The Courier Drone is a low-cost mid tech operator-driven VTOL courier capable of transporting small packages across regional distances. Equipped with two small arms to pick up and drop off packages, the drone can carry packages in a refrigerated compartment suitable for transport of biological specimens in addition to more mundane cargo. An onboard navigation system allows programmed flight with minimal user intervention but the drone's autonomous flight system does not always respond appropriately to obstacles and the manufacturer recommends an operator remain attentive during the drone's entire journey.

Robot	Hits	Locomotion	Speed	TL	Cost
Courier Drone	8	VTOL	—	8	Cr10000
Skills	Navigation 1				
Attacks	—				
Manipulators	2x (STR 3 DEX 5)				
Endurance	24 (6) hours				
Traits	Armour (+2), Flyer (medium), Small (-2)				
Programming	Drone (INT 0)				
Options	Auditory Sensor, Drone Interface, Navigation System (basic), Storage Compartment (3 Slots refrigerated),Transceiver 50km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

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Mining Drone

The standard asteroid Mining Drone used by many prospectors and belters is a sturdy thruster-based mining platform with a large set of mining tools and a manipulator arm to aid positioning and extraction. The drone's onboard thrusters can provide the equivalent of 1G acceleration for three hours but the drone generally relies on solar power and occasional station-keeping to operate at its target site. If operating without or far from sunlight, it can function for 18 hours in full darkness before depleting its batteries.

The Mining Drone has the equivalent capabilities of that presented on page 40 of *High Guard*. Five of these drones and their harnesses and processing equipment fit within 10 tons on a spacecraft; when sold as a set of five, the ore processing equipment and drone storage harnesses are included in the total drone pricing of MCr1. If the processing equipment is purchased separately, it consumes five tons and costs MCr0.2.

Robot	Hits	Locomotion	Speed	TL	Cost
Mining Drone	50	Thruster	—	12	Cr200000
Skills	Athletics (endurance) 2				
Attacks	—				
Manipulators	1x (STR 12 DEX 7)				
Endurance	18 (5) hours + Solar Coating (enhanced)				
Traits	Armour (+10), IR/UV Vision, Large (+2), Thruster (1G)				
Programming	Drone (INT 0)				
Options	Auditory Sensor, Drone Interface, Mining Equipment (large), PRIS Sensor, Solar Coating (enhanced), Transceiver 5,000km (enhanced), Vacuum Environment Protection, Wireless Data Link				

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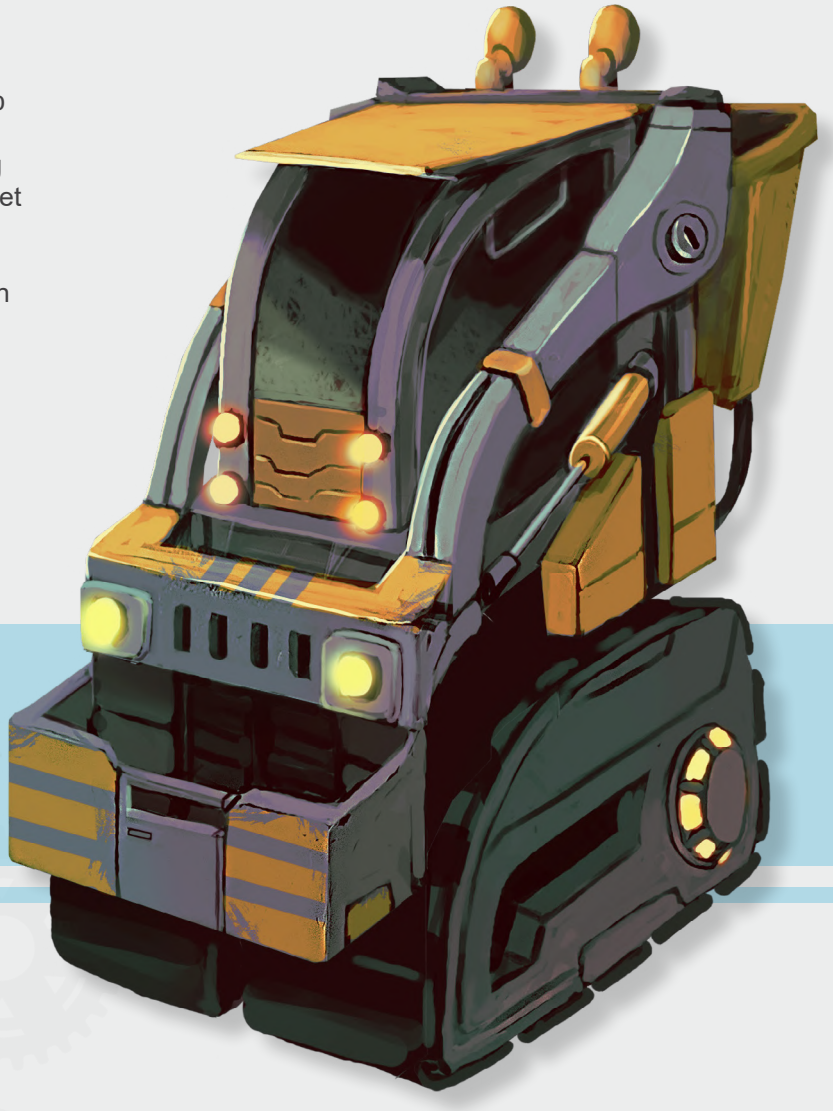
Offworld Construction Drone (OCD)

Operated remotely by a skilled construction worker or an Offworld Construction Master Robot (see page 165), the OCD is a blocky construction machine fitted with gecko-coated tracks to operate in microgravity. In addition to construction equipment allowing the machine to construct up to five cubic metres of building per hour, the OCD is equipped with a varied set of tools to facilitate installation and repairs of electronic and starship components. If stowed aboard a starship, the OCD consumes one ton of space and can be used as a repair drone, although it is unable to fit through standard hatches and iris valves.



Robot	Hits	Locomotion	Speed	TL	Cost
Offworld Construction Drone	50	Tracks	4m	12	Cr200000
Skills	Athletics (endurance) 1				
Attacks	—				
Manipulators	2x (STR 15 DEX 7)				
Endurance	432 hours				
Traits	Armour (+9), ATV, IR/UV Vision, Large (+2)				
Programming	Drone (INT 0)				
Options	Auditory Sensor, Construction Equipment (large), Cutting Torch (improved), Drone Interface, Electronics Toolkit (enhanced), Forklift (medium), Gecko Grippers, Mechanical Toolkit (advanced), PRIS Sensor, Radiation Environment Protection (+600 rads), Starship Engineer Toolkit (enhanced), Transceiver 500km (enhanced), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Probe Drone

The standard IISS Probe Drone is an ancient design originating in the First Imperium. It is a resilient grav-powered planetary survey drone, dropped from orbit in a disposable shell or deployed while in the atmosphere. It is incapable of returning to orbit and must be recovered from the ground or atmosphere, and has no independent capability other than a simple autopilot and navigator that fly it to a specified location. A thruster package allows the Probe Drone to operate in zero-gravity environments, although with limited acceleration and velocity capability. The thruster enables the Probe Drone to survey orbiting satellites, derelicts and other space debris and enables it to be positioned as a communications relay or observation satellite.

Nominally powered for 48 hours or 12 hours of high-speed flight at 300 kilometres per hour, extendable solar panels allow the Probe Drone to operate for extended periods if engaged in only minimal flight. A Probe Drone left in orbit around a world can function for up to 10 years before its solar panels degrade or maintenance failures or micrometeoroids damage key components.

Probe Drone, Advanced

The TL12 version of the Probe Drone is slightly more resilient and carries far more advanced sensors than the standard model. Externally, it appears similar to the lower tech version, although more advanced PRIS sensors and thin film solar panels rated for 25 years of harsh vacuum are obvious visual differences.

Robot	Hits	Locomotion	Speed	TL	Cost
Probe Drone	20	Grav, Thruster	—	9	Cr100000
Skills	Flyer (grav) 1, Navigation 1, Recon 1				
Attacks	—				
Manipulators	2x (STR 5 DEX 6)				
Endurance	48 (12) hours + 10 year half-life orbital solar panels				
Traits	Armour (+5), Flyer (high), Heightened Senses, IR Vision, Thruster (0.1G)				
Programming	Drone (INT 0)				
Options	Atmospheric Sensor, Auditory Sensor (broad spectrum), Autopilot (improved), Drone Interface, Light Intensifier Sensor (advanced), Navigation System (basic), Olfactory Sensor (basic), Recon Sensor (improved), Satellite Uplink, Solar Power Unit (basic), Spare Slot, Transceiver 5,000km (improved), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Advanced Probe Drone	22	Grav, Thruster	—	12	Cr160000
Skills	Flyer (grav) 2 , Navigation 2, Recon 3				
Attacks	—				
Manipulators	2x (STR 5 DEX 7)				
Endurance	72 (18) hours + 25-year half-life orbital solar panels				
Traits	Armour (+7), Flyer (high), Heightened Senses, IR/UV Vision, Thruster (0.1G)				
Programming	Drone (INT 0)				
Options	Atmospheric Sensor, Auditory Sensor (broad spectrum), Autopilot (enhanced), Drone Interface, Environment Processor, Navigation System (improved), Olfactory Sensor (advanced), PRIS Sensor, Recon Sensor (advanced), Satellite Uplink, Solar Power Unit (improved), Transceiver 5,000km (enhanced), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

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REPAIR DRONES

Repair Drones come in a variety of sizes, from giant extra-large units found mostly on capital ships to extra-small robots optimised for crawling through narrow conduits to fix faults. On smaller vessels, one ton of Repair Drones usually includes two medium, three small and three extra-small drones, although other combinations adding up to approximately MCr0.2 worth of drones are possible.

Repair Drones may be operated remotely using the Electronics (remote ops) skill or by a ship's computer running Auto-Repair software. If a ship's computer is simultaneously running Auto-Repair and Virtual Crew at any level, these drones may perform engineering functions beyond just damage repair. Many Repair Drones include at least a Primitive robot brain, allowing for very basic autonomous operations. This brain may be replaced with a more sophisticated brain to allow these same physical machines to perform ship crew functions. Ship's brains often use Repair Drones for a variety of tasks.

Repair Drone, Medium

Approximately the size and shape of a human crewmember, the medium Repair Drone can use standard ship tools and work panels in addition to operating its embedded tools.

Robot	Hits	Locomotion	Speed	TL	Cost
Medium Repair Drone	20	Walker	6m	10	Cr37000
Skills	—				
Attacks	—				
Manipulators	2x (STR 9 DEX 6)				
Endurance	130 hours				
Traits	Armour (+7), ATV, IR Vision				
Programming	Primitive (INT 1)				
Options	Auditory Sensor, Cutting torch (improved), Drone Interface, Fire Extinguisher, Gecko Grippers, Light Intensifier Sensor (advanced), Spare Slots x4, Starship Engineer Toolkit (improved), Storage Compartment (2 Slots), Transceiver 5km (improved), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

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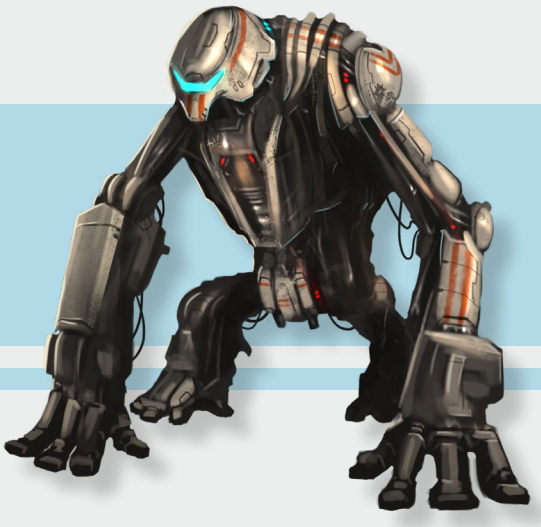
Repair Drone, Small

This drone is the size of a large child but optimised for working in tight spaces. With its walking limbs modified to act as manipulators it is often called the 'chimp drone', although this term is considered racist by uplifted Apes and generally not used in or near Solomani space. With an electronics toolkit fitted, it is not as adept as a medium drone with mechanical repairs but can access machinery difficult for a human-sized being to reach. The drone is still large enough to handle mechanical tools designed for full-sized hands.

Repair Drone, Extra-Small

The extra-small Repair Drone is designed to work within a ship's conduits and small access panels. The size and appearance of a small monkey, it is often referred to as a 'monkey drone'; it is humans that are most offended by this designation, especially if voiced by a member of another species. With dexterous hands on modified legs, it can operate well with all four limbs in both zero- and high-gravity environments. In a 1G setting, its small size and gecko grippers enables it to hang from vertical surfaces with a single hand.



Robot	Hits	Locomotion	Speed	TL	Cost
Small Repair Drone	12	Walker	6m	10	Cr31000
Skills	—				
Attacks	—				
Manipulators	2x (STR 7 DEX 6), 2x Manipulator Legs (STR 7 DEX 6)				
Endurance	130 hours				
Traits	Armour (+7), ATV, IR Vision, Small (-1)				
Programming	Primitive (INT 1)				
Options	Auditory Sensor, Cutting torch (improved), Drone Interface, Electronics Toolkit (enhanced), Fire Extinguisher, Gecko Grippers, Light Intensifier Sensor (advanced), Spare Slot, Storage Compartment (1 Slot), Transceiver 5km (improved), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Extra-Small Repair Drone	4	Walker	6m	10	Cr11000
Skills	—				
Attacks	—				
Manipulators	2x (STR 3 DEX 6), 2x Manipulator Legs (STR 3 DEX 6)				
Endurance	130 hours				
Traits	Armour (+3), ATV, IR Vision, Small (-3)				
Programming	Primitive (INT 1)				
Options	Auditory Sensor, Drone Interface, Electronics Toolkit (enhanced), Fire Extinguisher, Gecko Grippers, Light Intensifier Sensor (advanced), Transceiver 5km (improved), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

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Repair Drone, Large

The large drone occupies an entire ton of space and is generally carried only on ships larger than 200 tons. Only vaguely humanoid in appearance, with two large arms and two human-sized arms, the drone is hardened to operate in hazardous and high radiation environments and includes construction tools enabling it to rebuild damaged hull sections. Its toughened exterior and long duration power pack – allowing for more than two weeks of continuous operation – makes this drone ideal for power plant rebuilds and deep space work.

Robot	Hits	Locomotion	Speed	TL	Cost
Large Repair Drone	60	Walker	6m	10	Cr200000

Skills	Athletics (endurance) 2
Attacks	—
Manipulators	2x (STR 15 DEX 6), 2x (STR 9 DEX 6)
Endurance	389 hours
Traits	Armour (+11), ATV, IR Vision, Large (+2)
Programming	Primitive (INT 1)
Options	Auditory Sensor, Construction Equipment (medium), Cutting torch (improved), Drone Interface, Fire Extinguisher, Gecko Grippers, Industrial Cleaning Equipment (small), Light Intensifier Sensor (advanced), Radiation Environment Protection (+500 rads), Spare Slots x8, Starship Engineer Toolkit (improved), Storage Compartment (5 Slots), Transceiver 5km (improved), Vacuum Environment Protection, Voder Speaker, Wireless Data Link

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Repair Drone, Extra-Large

Occupying two full tons of storage space, the extra-large drone is normally found only on capital ships. Designed to clear and reconstruct major damage, the hulking drone does not fit through standard ship iris valves and hatches, and is normally located in engineering spaces or bays with external access, allowing the large machine to walk across the hull to a damaged section, gaining access through large hull breaches.

Robot	Hits	Locomotion	Speed	TL	Cost
Extra-Large Repair Drone	80	Walker	6m	10	Cr400000
Skills	Athletics (endurance) 2				
Attacks	—				
Manipulators	2x (STR 15 DEX 6), 2x (STR 11 DEX 6)				
Endurance	389 hours				
Traits	Armour (+13), ATV, IR Vision, Large (+3)				
Programming	Primitive (INT 1)				
Options	Auditory Sensor, Construction Equipment (large), Cutting torch (improved), Drone Interface, Fire Extinguisher, Gecko Grippers, Industrial Cleaning Equipment (large), Light Intensifier Sensor (advanced), Radiation Environment Protection (+500 rads), Spare Slots x16, Starship Engineer Toolkit (improved), Storage Compartment (8 Slots), Transceiver 5km (improved), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

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SkySpotter

SkySpotter is one of a great many very basic reconnaissance drones available from TL7 upwards. It carries forward and sideways looking optical and thermal cameras but little else. SkySpotter takes the form of a hand-thrown miniature aircraft powered by a set of rotors. It is quiet and small but tends to be rather obvious to anyone looking for such craft. The drone can be directly controlled using a selected waypoint system that requires no special skill beyond a familiarisation period or can fly a pre-set course. Its batteries are good for about six hours of operation. A control station is available but a SkySpotter drone can be controlled from any personal computer using software that comes free with every drone.

Robot	Hits	Locomotion	Speed	TL	Cost
SkySpotter	1	Aeroplane	—	7	Cr5000
Skills	—				
Attacks	—				
Manipulators	—				
Endurance	24 (6) hours				
Traits	Armour (+2), Flyer (medium), IR Vision, Small (-4)				
Programming	Drone (INT 0)				
Options	Auditory Sensor, Drone Interface, Recon Sensor (basic), Thermal Sensor, Transceiver 5km (basic), Visual Spectrum Sensor				

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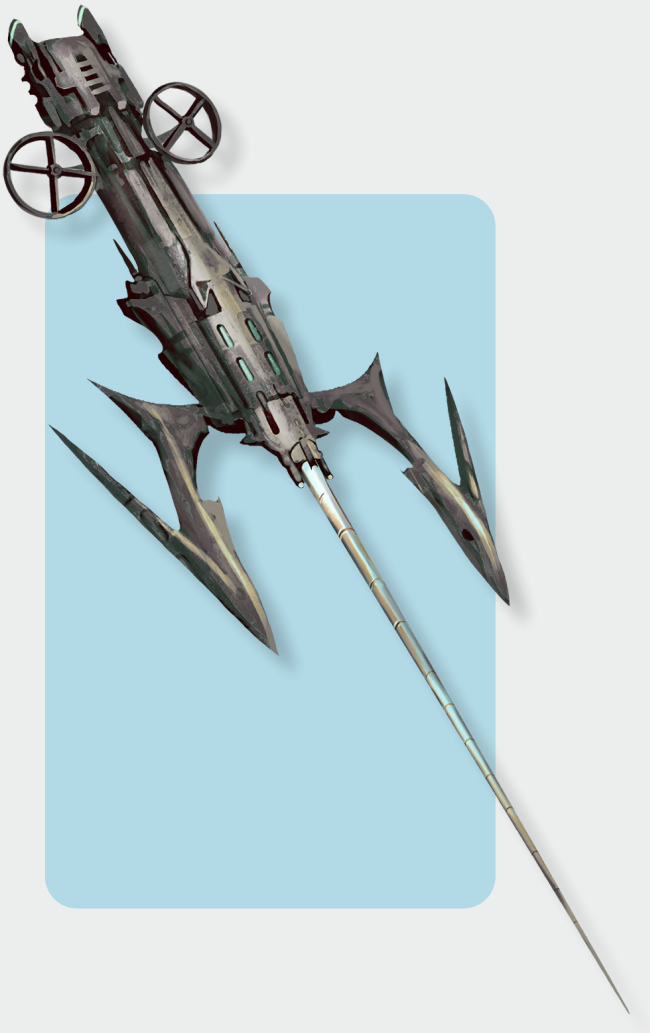
Microbots

Microbots, sometimes referred to as ‘micro robots’ or ‘bug bots’, range from 30 grams of mass and a few centimetres in length to less than 10 milligrams and fewer than three millimetres. They grow smaller with every advance in technology and more sophisticated as they shrink, able to perform all the functions of a full-size robot, except those requiring physical strength or vehicle-speed movement. Most microbots are reconnaissance machines, able to travel where larger beings cannot, but other clever or sinister uses are possible.



Exterminator

As a general rule, autonomous lethal robots are highly restricted; the Exterminator is an exception. Its sole purpose is to hunt down small vermin. Equipped with a Hunter/Killer brain that accounts for nearly all the Exterminator’s price, the microbot uses a sharp stinger blade to slice or impale its quarry. Set to range over an area and pursue prey back to a lair, the tiny six-rotor exterminator can fly through cracks in walls or under furniture to pursue any vermin it is programmed to terminate.

Robot	Hits	Locomotion	Speed	TL	Cost
Exterminator	1	VTOL	6m	11	Cr8000
Skills	Athletics (dexterity) 1, Melee 0, Recon 0				
Attacks	Stinger (1, AP 3)				
Manipulators	—				
Endurance	17 hours				
Traits	Flyer (idle), Heightened Senses, IR Vision, Small (-4)				
Programming	Hunter/Killer (standard) (INT 4)				
Options	Auditory Sensor (broad spectrum), Drone Interface, Light Intensifier Sensor (advanced), Stinger, Transceiver 5km (improved), Wireless Data Link				

Conny Delshagen (Order #42562827)

Hunter Bug

The Hunter Bug is a narrow 15-millitimetre-long 200mg microbot equipped with a retractable synthetic diamond blade nearly as long as its body. The blade is backed with a hollow channel capable of holding a single dose of fluid. The robot's Primitive brain allows some independent operation against a specific target but its major function is as a remotely controlled drone. As advertised, it uses its blade to exterminate common household pests. In actual operation, its sometimes poisoned blade is used against more diverse prey. The sharp blade can cut through light armour, slice critical blood vessels near the skin or inject poison into a full-sized target. The Hunter Bug can operate in swarms, overwhelming a lightly protected or unsuspecting target. At just a few millimetres in diameter, the Hunter Bug's thin body can penetrate nearly all but airtight rooms. Camouflaged against most senses and able to see in the dark, the Hunter Bug can strike a sleeping target without notice and escape undetected, although at its low price it is considered an expendable asset.

On some worlds, pest exterminators crowd-source drone operations, finding that certain individuals will pay for the privilege of remotely hunting vermin using a drone interface or helmet. Hunter Bug Leagues exist, with top scorers winning prizes or at least the admiration of their peers.

Robot	Hits	Locomotion	Speed	TL	Cost
Hunter Bug	1	Walker	9m	11	Cr3500
Skills	Melee (blade) 1, Stealth 3				
Attacks	Injector Needle Blade (1, AP 3)				
Manipulators	—				
Endurance	72 hours				
Traits	ATV, Heightened Senses, Small (-4)				
Programming	Primitive (homing) (INT 1)				
Options	Auditory Sensor (broad spectrum), Camouflage: Audible (advanced), Camouflage: Olfactory (improved), Camouflage: Visual (enhanced), Drone Interface, Gecko Grippers, Injector Needle, Light Intensifier Sensor (basic), Transceiver 50km (enhanced), Visual Spectrum Sensor, Wireless Data Link				

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Nano Hero

RoboHero's Nano Hero is a 1:200 scale action figure drone one centimetre or less tall. It lacks the full immersive experience of a Micro Hero avatar but, with a drone control helmet, it allows a user to experience the world in miniature. Each Nano Hero is a custom figure, equipped with a visilight camouflage surface that projects various 'features' on the robotic body. Equipped with gecko grippers and able to operate in a vacuum and low light-areas, the Nano Hero allows the 'adventurer' to explore pre-set environments or, often with an upgraded transceiver, real wilderness locations as a bug-sized heroic figure. Custom models generally start at Cr6100 but rare 'collectors editions' or one-of-a-kind body shapes go for many times this amount.

Robot	Hits	Locomotion	Speed	TL	Cost
Nano Hero	1	Walker	6m	13	Cr6100+
Skills	Stealth 4				
Attacks	—				
Manipulators	2x Microbot Manipulator (STR 0 DEX 8)				
Endurance	76 hours				
Traits	ATV, IR Vision, Small (-4)				
Programming	Drone (INT 0)				
Options	Auditory Sensor, Camouflage: Visual (superior), Drone Interface, Gecko Grippers, Light Intensifier Sensor (advanced), Olfactory Sensor (basic), Transceiver 5km (improved), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Peeping Spybot

The Peeping Spybot is a sophisticated grav-propelled microbot designed to provide information in nearly any environment. As a camouflaged disk 5mm in diameter and silent in operation, it is nearly indetectable without specialised equipment. Able to operate completely independently or by remote control, the Peeping Spybot is not fast but can pass through air ducts, travel across the sky, in vacuum and other hostile environments, transmitting data back to its operator. An onboard memory system can record its full 40+ hours of operation.

While many would balk at spending so much for such a tiny machine, the Peeping Spybot is a fully functional gravitic robot, capable of years of service, although it can still be swatted like a fly.

Robot	Hits	Locomotion	Speed	TL	Cost
Peeping Spybot	1	Grav	4m	12	Cr23000
Skills	Athletics (endurance) 1, Recon 2, Stealth 3				
Attacks	—				
Manipulators	—				
Endurance	65 hours				
Traits	Flyer (idle), Heightened Senses, IR/UV Vision, Small (-4)				
Programming	Basic (recon) (INT 4)				
Options	Auditory Sensor (broad spectrum), Camouflage: Visual (enhanced), Drone Interface, Encryption Module, Olfactory Sensor (advanced), PRIS Sensor, Transceiver 500km (enhanced),Vacuum Environment Protection, Wireless Data Link				

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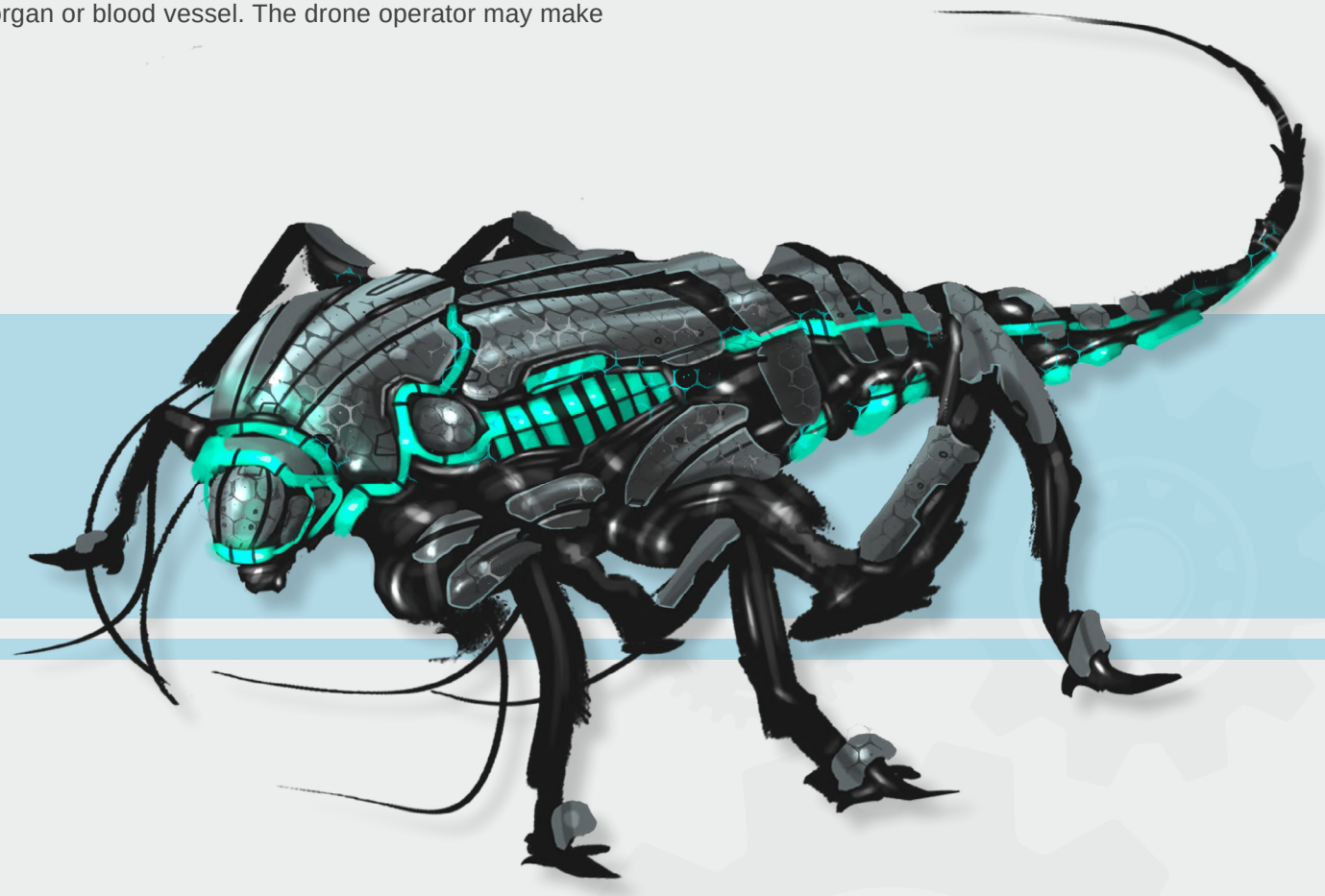
Popcorn Drone

A popcorn drone is an assassin weapon usually deployed in groups or swarms. Available at TL8, but better operated by higher Tech Level controllers, the popcorn drone's purpose is to attach itself to a target and explode. Doing only 1D damage, these drones are usually deployed in groups of at least four, using their small size to creep under doors and into bedrooms to catch a target unawares and unarmed. Some are equipped with a poisoned injector needle for extra effect but their main purpose is to detonate like a tiny shaped charge, preferably near a vital organ or blood vessel. The drone operator may make a melee attack with each drone and apply the Effects to the damage roll. The TL8 version is a full gram in mass but higher tech versions are a fraction of this size and use strategically placed TDX charges to achieve their explosive effect.

Popcorn Drones have no legitimate use and available for sale only to governments or on the black market; this may increase their costs dramatically if available at all. They are an insidious but expensive assassination tool.



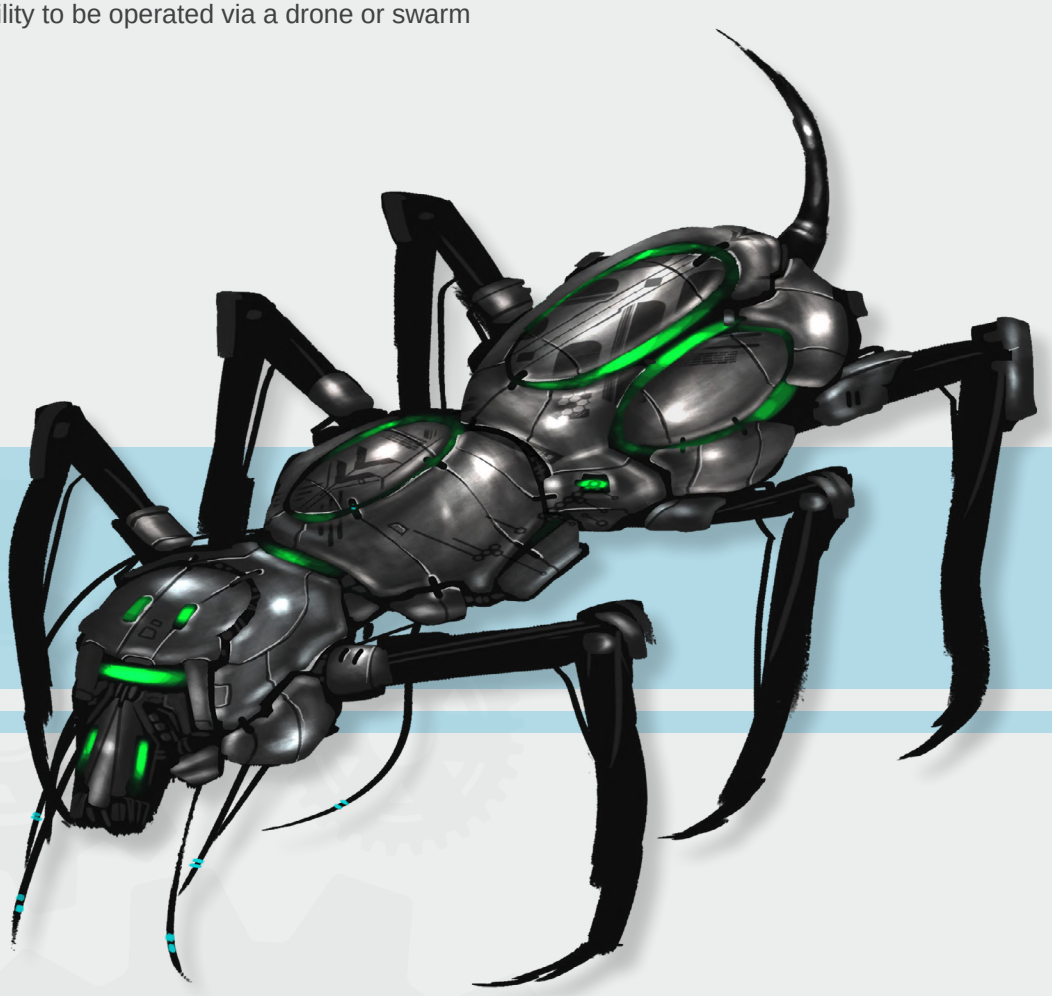
Robot	Hits	Locomotion	Speed	TL	Cost
Popcorn Drone	1	Walker	6m	8	Cr3000
Skills	—				
Attacks	Self-Destruct 1D, Injector Needle (1, AP 2)				
Manipulators	—				
Endurance	50 hours				
Traits	ATV, Heightened Senses, IR Vision, Small (-4)				
Programming	Drone (INT 0)				
Options	Auditory Sensor (broad spectrum), Drone Interface, Injector Needle, Microbot Offensive Self-Destruct, Transceiver 5km (improved), Thermal Sensor, Visual Spectrum Sensor, Wireless Data Link				

Conny Delshagen (Order #42562827)

PopcornBot

A more intelligent version of the Popcorn Drone, this microbot is equipped with a Hunter/Killer brain and able to act independently. As with its predecessor, the tiny assassin bug will self-destruct but may precede this action with a jab from its injector needle. Both needle attack and self-destruct may be aided by separate Melee checks but only the self-destruction function inflicts extra damage on Effect. PopcornBots retain the ability to be operated via a drone or swarm controller but are most often used as a 'release-and-forget' weapon with a single designated target. When operating independently, they are unable to coordinate their attacks but a Cr20000 version with a tactical package can coordinate with others similarly equipped.

As with Popcorn Drones, these microbots are difficult to obtain legally and tend to sell at a significant premium.



Robot	Hits	Locomotion	Speed	TL	Cost
PopcornBot	1	Walker	6m	12	Cr9000
Skills	Melee 0, Recon 0				
Attacks	Injector Needle (1, AP 4), Self-Destruct 1D				
Manipulators	—				
Endurance	76 hours				
Traits	ATV, Heightened Senses, IR Vision, Small (-4)				
Programming	Hunter/Killer (standard) (INT 4)				
Options	Auditory Sensor (broad spectrum), Drone Interface, Injector Needle, Microbot Offensive Self-Destruct, Transceiver 50km (enhanced), Thermal Sensor, Visual Spectrum Sensor, Wireless Data Link				

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Scout Mite

The Scout Mite was designed to be carried in quantity by a Forensic Supervisor Droid. Equipped with a Primitive brain it is more drone than droid, although capable of limited independent action. The most expensive components of this 15mg, 4mm long microbot are its sensor arrays, including a full spectrum PRIS array and wide frequency auditory receptors. Deployable individually or in swarms, a one Slot container can hold thousands of Scout Mites.

Searcher Microbot

The Searcher is a reconnaissance robot useful in both survey and search and rescue roles, and has found an unadvertised niche as a spybot. The small multilegged robot is less than a centimetre in length and has six walking legs. Its two tiny manipulators capable of moving small objects up to its own mass. Equipped with gecko legs, it can walk across nearly any surface, on floor, walls or ceiling, and can crawl through small crevasses, all while providing a high-definition video feed to a remote observer. Capable of both autonomous and controlled action, the Searcher can operate indefinitely with access to sunlight and for up to six days in total darkness on internal power.

When delivered to the surface of an unexplored planet, the Searcher can operate independently for years, although its ability to store information is limited by its size. In most instances, it will broadcast a burst of data at the request of an orbiting satellite or spacecraft or to a remote base station on the surface of the planet.

Robot	Hits	Locomotion	Speed	TL	Cost
Scout Mite	1	Walker	6m	14	Cr4000
Skills	Recon 0				
Attacks	—				
Manipulators	2x (STR 0 DEX 8)				
Endurance	76 hours				
Traits	ATV, Heightened Senses, IR/UV Vision, Small (-4)				
Programming	Primitive (alert) (INT 1)				
Options	Auditory Sensor (broad spectrum), Drone Interface, Gecko Grippers, PRIS Sensor, Transceiver 5km (improved), Vacuum Environment Protection, Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Searcher Microbot	1	Walker	4m	12	Cr10000
Skills	Recon 2				
Attacks	—				
Manipulators	2x (STR 0 DEX 7)				
Endurance	173 hours + Solar Coating (enhanced)				
Traits	Heightened Senses, ATV, IR Vision, Small (-4)				
Programming	Basic (recon) (INT 4)				
Options	Auditory Sensor (broad spectrum), Drone Interface, Gecko Grippers, Olfactory Sensor (improved), PRIS Sensor, Solar Coating (enhanced), Transceiver 500km (improved), Vacuum Environment Protection, Wireless Data Link				

Conny Delshagen (Order #42562827)

Nanorobots

Nanorobots are available at TL13 in certain jurisdictions, usually subject to considerable regulation that may vastly increase cost and create black market demand, especially for medical nanorobots. Within the Imperium, nanorobots are rarely encountered and highly regulated. Exceptions exist, such as the world Neumann in the Gazulin subsector of the Trojan Reach. Even on Neuman, nanorobot packages are only available to civil servants through government channels. These packages are tailored to certain job roles.

On other worlds where nanotech is available, custom medical packages are available, usually focused on a single aspect of nanotechnology and subject to the limitation of 1.5 litres infused within one individual, although black market operators may violate this guideline.

Construction and environmental nanorobots are more readily available but subject to strict regulation, both to avail public opinion and conventional competitor's concerns.

Conny Delshagen (Order #42562827)

Construction Nano Queen

Often called the 'Swarm Mother' the Construction Nano Queen is a dog-sized quadruped robot designed to independently run sets of construction or environmental nanorobots. Originally designed for the asteroid mining and space construction industries, the Swarm Mother is also found in terrestrial excavation, construction and clean-up roles for which it is rather overengineered. Coated with advanced solar absorption panels, the robot can operate indefinitely in a system's habitable zone and significantly beyond. Its highly efficient power system and battery packs allow for more than a month of operation without any sunlight.

The Construction Nano Queen is equipped with two advanced swarm controllers, allowing simultaneous operation of up to 0.8 litres of construction nanos performing multiple tasks. Its TL14 brood of nanos last for 1,000 hours, or six weeks of operation, capable of excavating nearly 450 cubic metres or 32 displacement tons of material during their lifespan. However, the Nano Queen is also equipped with a small fabrication chamber, able to recycle the worn-out nanos and return them to service. With the original set of nanos and spare material carried in a small internal storage container the Nano Queen can guide the excavation of five displacement tons per week essentially indefinitely. A Nano Queen must remain within 50 metres of nanos to maintain control but nanos continue to function at their assigned tasks with all the literalness of a Primitive-brained robot if the controlling robot moves out of range to recharge its power cells.

A Nano Queen's cost does not include an initial set of nanos. It normally carries eight 0.1 litre packages of nanos, as that is the most it can control, although it might set additional nano swarms in operation for a simple task, such as 'dig a tunnel three metres in diameter in a straight line until deactivated or reprogrammed. The robot can carry up to two litres (20 packages) of nanos or nano components internally. Components require a full day to assemble in the fabrication chamber and each production run must be of identical nanos but raw components cost only half the price of functional nanos. For every year of operation, repeatedly recycled nanos consume their equivalent amount of raw components.

Robot	Hits	Locomotion	Speed	TL	Cost
Construction Nano Queen	8	Walker	3m	14	Cr400000
Skills	Athletics (endurance) 2, Electronics (remote ops) 2, Profession (construction) 2, Profession (fabrication) 2				
Attacks	—				
Manipulators	2x (STR 6 DEX 9)				
Endurance	778 hours + Solar Coating (advanced)				
Traits	Armour (+4), ATV, IR/UV Vision, Small (-2)				
Programming	Very Advanced (INT 9)				
Options	Auditory Sensor, Drone Interface, Fabrication Chamber (1 Slot enhanced), Gecko Grippers, PRIS Sensor, Solar Coating (advanced), Storage Compartment (hazardous material), Swarm Controllers (advanced) x2, Transceiver 5,000km (enhanced), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Neumann Archon-Class Nanotech

The Shield Church rules the world of Neumann, keeping in bay an ancient nanotech plague that devasted much of the planet. Archons are high officials of the Church, leaders in the battle against rouge nanotech and representatives of the Church to the outside universe. Their nanos allow them to better perform these duties. At TL13, this nanotech must be renewed annually.

Neumann Knight-Class Nanotech

The frontline fighters in Neumann's war against rogue nanotech are the Flame Knights. To aid their struggle, they receive an annual infusion of medical nanotech to increase their fighting prowess and resist infection.

Strend Les Mecanismes Nanotech

The world of Strend, lying beyond the Imperium's borders in the Menorial subsector of the Trojan Reach, is ruled by a cybernetic elite known as *Les Mecanismes*. These reclusive rulers are rumoured to be centuries-old, their health maintained by cybernetics, anagathics and nanotech. At TL14, their nanotech must be replenished every two years and for the oldest of them, the anti-aging portion of this mixture has long since lost efficacy.

Item	TL	Effects	Litres	Cost
Archon-Class Nanotech	13	END+3, INT+2, STR+1, DEX+1, DM+4 to resist nanotech infections	1.4	Cr360000

Item	TL	Effects	Litres	Cost
Neumann Knight-Class Nanotech	13	END+3, STR+1, DEX+1, DM+4 to resist nanotech infections	1.2	Cr240000

Item	TL	Effects	Litres	Cost
Les Mecanismes Nanotech	14	END+3, INT +3, STR+1, DEX+1, Age rate reduction	1.5	Cr480000

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Androids

Androids are synthetic beings that remain steeped in controversy and distrust, especially in regions where unease with robots impersonating biological beings is prevalent. These 'pseudobiological' robots, to use the technical term – or 'skinjobs' to use the common slur – look more and more like natural beings as their bodies and minds grow more sophisticated. Those who fit best into society are those who have their own, non-natural identity, carving a niche for a new type of organism, not one overtly reminding the biological sophonts they might one day be replaced.

Android, Enhanced

The Enhanced Android is the first model that can pass as biological without very close inspection. Although not inexpensive, this model is designed for flexibility, with one of four spare Slots available for a chassis 'undercoating' including armour or environmental protection options. The additional three Slots are located among modular components and can be installed in arms or torso with relocation of internal components. Equipped with a self-repairing chassis, the Enhanced Android is intended for operating environments that might be hazardous to biological beings and is equipped with a highly efficient power system capable of nine days continuous operations. Improved sensors, including multi-frequency PRIS vision, allow it to operate as a scout in remote locations. Three Bandwidth of computing power are reserved for skill packages and one of the spare Slots can be used for expanded Bandwidth if desired. The Enhanced Android comes in six common humanoid models, with customisation available, subject to the normal tripling of option prices for android installation, both at purchase and at a later date.

Robot	Hits	Locomotion	Speed	TL	Cost
Enhanced Android	20	Walker	7m	12	MCr2
Skills	Athletics (dexterity) 2, Athletics (strength) 2, Navigation 1, Recon 2, +3 Bandwidth available				
Attacks	—				
Manipulators	2x (STR 12 DEX 12)				
Endurance	216 hours				
Traits	ATV, Heightened Senses, IR/UV Vision				
Programming	Very Advanced (INT 9)				
Options	Android (enhanced), Auditory Sensor (broad spectrum), Drone Interface, Navigation System (basic), Olfactory Sensor (basic), PRIS Sensor, Recon Sensor (enhanced), Self-Repairing Chassis, Spare Slots x4, Transceiver 500km (enhanced), Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Android, Superior

Still an experimental development, the Superior Android is a robot designed to mimic sentient beings in every way bar one – free will. These robots can pass themselves off as human (or any other species), although they are typically marked in some way so confusion does not arise, and designed to be employed in tasks that would normally require sentience but are repetitive, unpleasant or dangerous. This includes long-ranged exploration, advanced construction and pleasure duties. Superior Androids can be programmed with any skill or range of skills, up to level 4. These androids are powered by a shielded short duration RTG, allowing completely independent field operations for five years, a built-in obsolesce feature which adds considerably to their cost, but provides a safety valve to ensure these highly advanced robots do not develop in unexpected directions.

Robot	Hits	Locomotion	Speed	TL	Cost
Superior Android	24	Walker	6m	16	MCr14
Skills	As defined upon purchase, +15 Bandwidth available				
Attacks	None as standard, 2 Slots available				
Manipulators	2x (STR 12 DEX 12)				
Endurance	5 years RTG half-life (130 hours)				
Traits	ATV, Heightened Senses				
Programming	Self-aware (INT 13)				
Options	Android (superior), Auditory Sensor, Environment Processor, RTG Short Duration (advanced), Spare Slots x2, Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker (broad spectrum), Wireless Data Link				

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Body Double

A Body Double is a custom android built to emulate a specific person. As a custom model, these robots generally sell for a premium and are only available from speciality retailers with a reputation for both quality and discretion. A Body Double requires weeks of acclimation in the presence of its biological double in order to perfect its deception. Body Doubles are designed to protect a target from assassination or abduction and can switch into a combat mode to protect themselves and fend off an attack. If abducted, they are programmed to self-destruct, igniting a powerful charge that also detonates their long-duration power packs.

Body Doubles are illegal or restricted on many worlds, although those who can afford them often have ways to circumvent regulations. These restrictions are based on two factors: First, many worlds derive their robot regulations from the Shudusham Concords, an ancient robot treaty whose 37th Amendment specifically prohibits androids from passing as living beings. Second, the self-destruct feature is a direct affront to the incident that led to the Concords in the first place. In some instances, a compromise configuration is available, one that does not include the self-destruct device but a system for notifying local law enforcement under specified conditions, such as abduction or direct threats to the Body Double. Also, some variants are required to respond to a correctly worded or transmitted challenge and identify themselves as artificial beings. Some Body Doubles are manufactured with these restrictions and later altered by their owners to contravene them, a crime on many worlds with penalties ranging from fines to long-term incarceration.

Detecting a Body Double normally requires a Very Difficult (12+) Investigate check (1D minutes, INT), although someone with great familiarity of the original will only find this task Difficult (10+). A medical exam or densitometer check instantly determines the true nature of the Body Double.

MCr1.8 is a starting price for a Body Double. While a Body Double can emulate the behaviour of its biological template, it does lack the person's skills; additional computing capacity is required to emulate any skills possessed by the original. The robot's endurance allows for more than 36 days of continuous operation or nearly two months if emulating 'sleep'; this is sufficient in most technological areas as the robot can surreptitiously recharge but robots intended for long-term field use require RTG power units, which vastly increase the cost of the Body Double.

Robot	Hits	Locomotion	Speed	TL	Cost
Body Double	20	Walker	5m	15	MCr1.8
Skills	Athletics (all) 2, Deception 2, Melee (unarmed) 4				
Attacks	Claws (1D+4), Self-Destruct (12D, Blast 5)				
Manipulators	2x (STR 12 DEX 12)				
Endurance	864 hours				
Traits	Armour (+6), ATV				
Programming	Very Advanced (INT 11)				
Options	Android (advanced), Auditory Sensor, Self-Destruct System: Offensive, Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Ceiling Cat

A robotics exhibition concept model from the Shinku University Research Directorate (SURD), which became a status symbol among the wealthy, the Ceiling Cat or 'the Cat That Walks Up Walls' is an extremely realistic android cat. Its tiny front paws and prehensile tail are all dexterous manipulators and the gecko pads on all four paws allow it to climb not only up walls but also across ceilings. It requires a Very Advanced Brain to control its natural-looking body and give it the quickness and sensory skills it needs, making it smarter than many of its well-heeled owners. Available in dozens of 'breeds' and with custom Zero-Slot options beyond the standard vacuum-proofing and 'sticky' paws, a Ceiling Cat can run up to MCr1 or more. The robot tends to develop a strong attachment to its owner and its cat-like personality makes second-hand Ceiling Cats finicky purchases. Although SURD offers a programming reset service for 'only' Cr20000, it sometimes does not take.

Robot	Hits	Locomotion	Speed	TL	Cost
Ceiling Cat	4	Walker	8m	15	Cr360000
Skills	Athletics (dexterity) 3, Recon 2, Stealth 3				
Attacks	—				
Manipulators	4x (STR 3 DEX 12)				
Endurance	144 hours				
Traits	ATV, Heightened Senses, IR Vision, Small (-3)				
Programming	Very Advanced (INT 9)				
Options	Android (advanced), Auditory Sensor (broad spectrum), Drone Interface, Gecko Grippers, Light Intensifier Sensor (advanced), Olfactory Sensor (advanced), Transceiver 500km (advanced), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

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Companion

A Companion is a lower cost advanced android designed to closely emulate a biological being. Beyond an obvious utility, the Companion is often used as a lower cost body double, emulating physical appearance, but not adept at the mannerisms or skills of the original. There is a niche market for Companions that are duplicates of historical or fictional characters for use in performance art roles.

The basic Companion model costs Cr900000 but has considerable upgrade protentional. Six spare Slots can hold anything from an avatar interface to a concealed weapons system. The spare Slots of the companion are located in the arms and torso, and the structure of the Companion precludes retrofitting coatings and whole chassis upgrades such as armour or environment protection options.

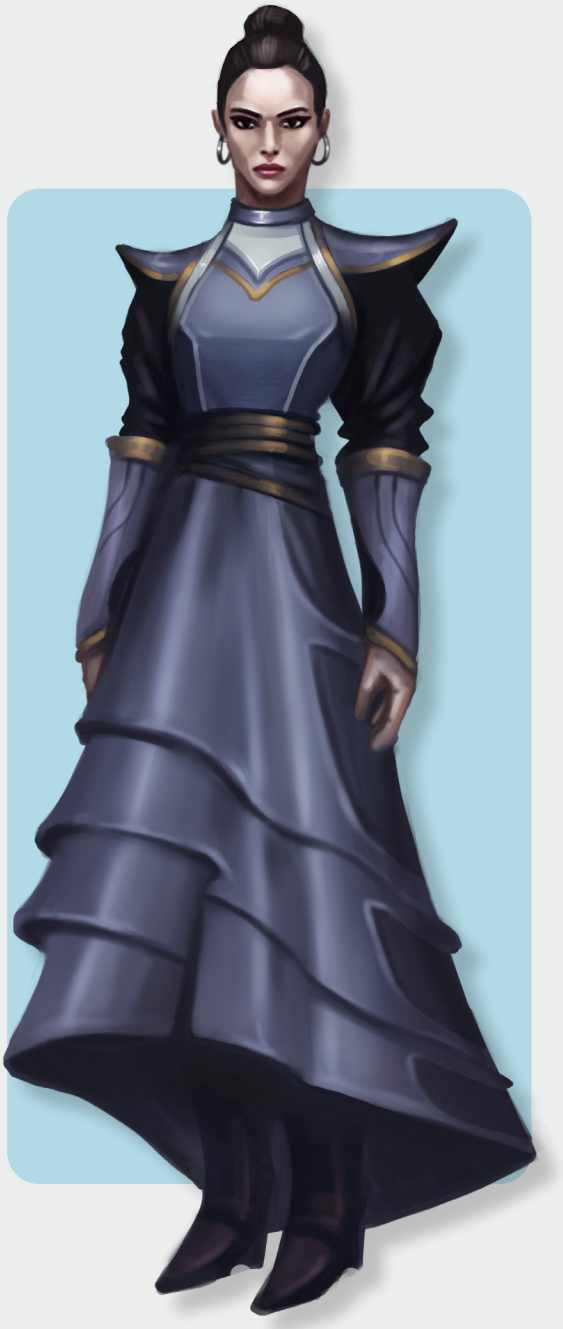
Upgrades to the brain must normally be installed upon manufacture but can greatly increase skill range and expertise. Even without upgrades, the robot has one Bandwidth available for additional programming. All upgrades to the Companion except skill packages are subject to standard tripling of cost to accommodate android compatibility.

Robot	Hits	Locomotion	Speed	TL	Cost
Companion	20	Walker	6m	14	Cr900000
Skills	Art (performer) 2, Athletics (dexterity) 1, Athletics (strength) 1, Carouse 1, Medic 1, Steward 1, +1 Bandwidth available				
Attacks	—				
Manipulators	2x (STR 9 DEX 9)				
Endurance	108 hours				
Traits	ATV				
Programming	Very Advanced (INT 9)				
Options	Android (advanced), Auditory Sensor, Drone Interface, Olfactory Sensor (basic), Spare Slots x6, Storage Compartment (2 Slots), Transceiver 500km (advanced), Visual Spectrum Sensor, Voder Speaker (broad spectrum), Wireless Data Link				

Conny Delshagen (Order #42562827)

Counsellor

Most robots find interpersonal skills difficult, requiring extra Bandwidth to properly process natural conversations and meaningful interactions with biological sophonts. The Shinku University Research Directorate (SURD) has challenged this deficiency with an advanced android that is not only physically convincing, but conversationally convincing and then taking this one step further to create the very lifelike Counsellor as an expert in psychology and interpersonal relationships. Applying SURD's known prowess in convincing android construction and the most advanced robotic brain available, the Counsellor can provide expert psychological services and interact with biological beings. Highly intelligent, it often uses spare Bandwidth 0 skills to study additional languages or obscure dialects in order to interact convincingly with the broadest range of people. The Counsellor demands a high price but is sometimes found as a confidential advisor to members of government and industry at the highest levels. The Counsellor intentionally does not have a drone interface installed, making it more difficult to remotely access. It does however have an advanced robotic drone controller to manage subsidiary drones on its own and three spare Slots for custom 'special options', which can include armour or other environmental options if specified at purchase.



Robot	Hits	Locomotion	Speed	TL	Cost
Counsellor	20	Walker	6m	15	MCr5.6
Skills	Admin 2, Advocate 2, Athletics (dexterity) 1, Athletics (strength) 1, Carouse 4, Deception 4, Electronics (all) 2, Investigate 4, Leadership 3, Medic 3, Persuade 4, Profession (counsellor) 4, Recon 2, Science (psychology) 4, Steward 2, Streetwise 2				
Attacks	—				
Manipulators	2x (STR 9 DEX 9)				
Endurance	288 hours				
Traits	ATV, Heightened Senses, IR/UV Vision				
Programming	Self-aware (INT 12)				
Options	Android (advanced), Auditory Sensor (broad spectrum), Olfactory Sensor (advanced), PRIS Sensor, Quick Charger, Robotic Drone Controller (advanced), Self-Repairing Chassis, Spare Slots x3, Transceiver 500km (advanced), Voder Speaker (broad spectrum), Wireless Data Link				

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Elvis Performance Double

Manufactured by Makhidkarun's entertainment division, this robot is named after a pre-spaceflight Terran performer more known for his impersonators than any of his lost recordings. Very few of these androids are actually duplicates of Elvis but a wide line of impersonation robots provides copies of past and present performers from throughout Charted Space. These duplicates mimic the gestures, voice and talents of singers, actors, poets and other performers. Touring groups of major interstellar entertainers often send these doubles to 'B-List' systems off the main trade lanes to increase their tour revenues.

Some performance troupes consist of a single android and support crew, others are large companies of android entertainers who set up shop in major population centres for extended performances across a wide variety of arts. While each android is normally sculpted and programmed to emulate a specific real or fictional performer, some more generic models have replaceable faces and reprogrammable personalities to allow them to impersonate a variety of characters with similar builds. To cut costs, these performance doubles are not built with the most advanced android technology or the latest available robotic brains but they are not designed for close-up one-on-one encounters although more than sufficient to be convincing doubles before a crowd of spectators. Vast high-tech Makhidkarun factories can produce these robots by the thousands, distributing them across sectors from the Spinward Marches to the Solomani Rim.

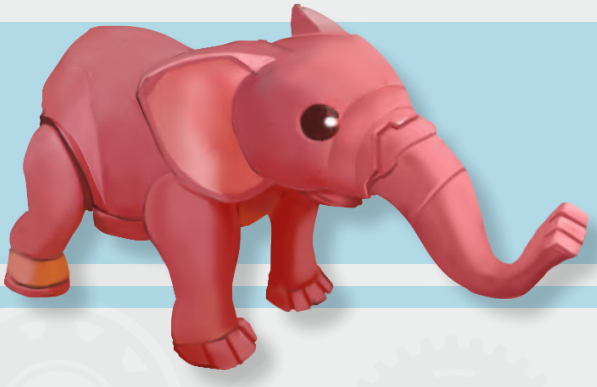
A built-in avatar receiver allows some individuals with the proper cybernetic implants to inhabit the body of a performance double, allowing an expensive form of cybernetic karaoke. For those without the considerable brain hardware required to control an avatar, Makhidkarun sells a bundle including both the Performance Double and a deluxe avatar chair for only Cr950000.

Robot	Hits	Locomotion	Speed	TL	Cost
Elvis Performance Double	20	Walker	6m	15	Cr500000
Skills	Art (performer) 3, Athletics (dexterity) 1, Athletics (strength) 1, Deception 1				
Attacks	—				
Manipulators	2x (STR 9 DEX 9)				
Endurance	144 hours				
Traits	ATV				
Programming	Very Advanced (INT 9)				
Options	Android (enhanced), Auditory Sensor, Avatar Receiver, Drone Interface, Spare Slots x7, Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker (broad spectrum), Wireless Data Link				

Conny Delshagen (Order #42562827)

Dupal Companion Robot

Dupal was designed as a children's companion. It is a soft-skinned robot with a basic android shape of a pink elephant with fully developed hands on its front limbs and a flexible grasper trunk that acts as a third manipulator. About the size of a large dog, the Dupal is meant to act as nanny, companion and nurse-mate for children under the age of 10. It is sometimes used to aid the elderly in the home and has the strength to lift and support a full-sized human if necessary. Equipped with cleaning equipment, a medical kit and a fire extinguisher, the Dupal loyally watches over its charge. Its cartoonish pink elephant appearance coupled with the ability to stand fully upright sometimes leads to derisive comments but its target demographic of children and elderly dementia patients find the Dupal to be a pleasant and helpful companion.



Surrogate Droid, Improved

A Surrogate Droid is a natural-looking android upgrade to the basic droid. While its internal bioreactor is hardly more complex than that of its robotic-looking predecessor, the improved Surrogate Droid can pass as a biological being at a distance. With an advanced brain and flexible programming, it can fit into a household, although by default is equipped to function as domestic servant or caregiver, often of a child it has previously carried to term. In some societies, this robot is termed a 'mommy bot' in others, such a role is considered taboo or at least in poor taste.

Robot	Hits	Locomotion	Speed	TL	Cost
Dupal Companion Robot	12	Walker	6m	12	Cr90000
Skills	Medic 1, Profession (caregiver) 1				
Attacks	—				
Manipulators	3x (STR 9 DEX 7)				
Endurance	108 hours				
Traits	ATV, Small (-1)				
Programming	Advanced (INT 8)				
Options	Android (basic), Auditory Sensor, Domestic Cleaning Equipment (small), Drone Interface, Fire Extinguisher, Medikit (improved), Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Improved Surrogate Droid	20	Walker	6m	10	Cr500000
Skills	Medic 0, Profession (domestic servant) 1, Science 0, Steward 1				
Attacks	—				
Manipulators	2x (STR 9 DEX 6)				
Endurance	65 hours				
Traits	ATV, Heightened Senses				
Programming	Advanced (INT 6)				
Options	Android (enhanced), Auditory Sensor (broad spectrum), Bioreaction Chamber (8 Slots, enhanced), Drone Interface, Olfactory Sensor (basic), Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

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Synthetic Horse

On worlds where vehicles are prohibited or restricted, Travellers are often forced to rely on animal transport. The Terran horse is a common form of animal locomotion across regions of Charted Space with any Solomani heritage. Riding a horse is a particular skill that most members of a technological society have not mastered, so rather than suffer the indignities of struggling with an unpredictable mount and 'negotiating' direction and speed of travel, some Travellers choose to import a synthetic horse, an android 'animal' close enough to pass most inspections, especially on low tech planets.

The Synthetic Horse is an old android design with many variations available for sale and even short-term lease options offered at nearby higher tech worlds. The Basic robot brain contains a custom package designed to emulate the behaviour of a horse and respond to both verbal and electronic commands in a manner that mimics the real animal. It even has the capacity to 'eat and drink' and use the chemical energy of the input to recharge its extra power packs. While standard models are very reasonably priced for androids, with costs reduced by millennia of production since the Synthetic Horse's introduction during the Long Night; adding options to the android's significant spare capacity, and especially adding full body options, requires triple the cost of those options for androids plus an installation charge, which can be especially high for retrofits.

Robot	Hits	Locomotion	Speed	TL	Cost
Synthetic Horse	32	Walker	11m	11	Cr150000
Skills	Athletics (endurance) 2, Melee 0, Recon 0				
Attacks	Kick (2D), Bite (1D)				
Manipulators	—				
Endurance	86 hours				
Traits	Armour (+0), ATV, Large (+1)				
Programming	Basic (horse) (INT 4)				
Options	Android (improved), Auditory Sensor, Drone Interface, Spare Slots x16, Transceiver 5km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Biological Robots

These robots are biological beings, usually clones or otherwise vat-grown, with a robot brain and interfaces replacing their natural nervous system. As such, they have poor public perception in many cultures. Legality and acceptance vary drastically.

Entourage Biobot

The Entourage Biobot is for people who want to have a large entourage but who may not have the charisma or prestige to maintain one. They must have a fair amount of money, however. This is an improved biological robot built around a cloned or manufactured body and equipped with an artificial brain and nervous system. Appearance can be customised and some genetic profiles may add to the cost of the biobot. Normally produced in enhanced fabrication chambers with a brain separately produced but integrated into the process, these robots are flexible in appearance and can support most skill level 2 packages. Upgraded brains are available, although they add significantly to the biobot's cost. A skill package can be switched out for Cr50000 with wireless data link remote programming, as the brain is embedded in a biological skull and has no serviceable parts. As a biobot, it is subject to normal healing and aging. Its four spare Slots are placed in prespecified custom location, with up to two Slots available in each arm or up to all four Slots available in the torso. These add-ons usually require access for service.

Robot	Hits	Locomotion	Speed	TL	Cost
Entourage Biobot	20	Walker	6m	13	Cr390000
Skills	Art (TBD) 2, Athletics (dexterity) 1, Athletics (strength) 1				
Attacks	—				
Manipulators	2x (STR 9 DEX 9)				
Endurance	As biological being				
Traits	Armour (+0), ATV				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Biological Robot (improved), Drone Interface, Olfactory Sensor (basic), Spare Slots x4, Transceiver 500km (enhanced), Visual Spectrum Sensor, Voder Speaker (broad spectrum), Wireless Data Link				

Conny Delshagen (Order #42562827)

Impersonator

Ever want to be some else? The Impersonator is an avatar drone designed to allow a person to inhabit the body of a biological robot through the use of avatar control technology. Each Impersonator is a custom biological robot, a designed and quick-grown clone with an embedded avatar receiver and robotic brain. Actual physical characteristics vary depending on the characteristics of the clone itself. When not operating under avatar or drone control, the Impersonator's Basic robot brain allows it to follow basic instructions, feed and clean itself, but has no special skills. The price indicated for the Impersonator is for a standard clone, quick-grown from a template or sample. Custom clones with exceptional attributes or created genomes might be more expensive. Batch purchases of the same model may reduce costs by up to 25%. The Impersonator is not bundled with any sort of avatar control system, although resellers might offer a package deal.

The legality of Impersonators varies with jurisdictions. It is a category of robot not covered in the Shudusham Concords and some would argue it is not really much of a robot at all.

Robot	Hits	Locomotion	Speed	TL	Cost
Impersonator	20	Walker	6m	13	Cr400000
Skills	—				
Attacks	—				
Manipulators	2x (STR 9 DEX 8)				
Endurance	As biological being				
Traits	none				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Avatar Receiver, Biological Robot (improved), Drone Interface, Olfactory Sensor (basic), Spare Slots x3,Transceiver 5,000km (improved), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

Zombie

Rather than build a biological robot, especially at lower Tech Levels where this can be a lengthy process, why not just appropriate a fully-grown body to act as a biological robot? While these biological robots are generally designated by obfuscated brand names, such as ‘Supplemental Labour Unit’ or ‘Biological Work Beings’ they are nearly universally referred to as ‘zombies’.

Zombie might be a technical misnomer for this type of biological robot, as working with the already deceased can be challenging. However, working with functional bodies of brain-dead individuals, ‘snatching’ living beings or applying a rather macabre form of capital punishment are ways to acquire a living being ripe (or at least ready) for robotic brain implantation. The procedure is still complicated, feeding cybernetic nerves into biological nerves, and often benefits from the skills of a cyberneticist, but as early as TL11 a biological being can be converted into a biological robot and put to work as essentially slave labour.

Zombies can be commanded via drone or swarm controllers, usually as large work teams.

Robot	Hits	Locomotion	Speed	TL	Cost
Zombie	20	Walker	6m	11	Cr100000
Skills	Profession (labourer) 2				
Attacks	—				
Manipulators	2x (STR 9 DEX 7)				
Endurance	As biological being				
Traits	—				
Programming	Basic (labourer) (INT 4)				
Options	Auditory Sensor, Biological Robot (basic), Drone Interface, Olfactory Sensor (basic), Spare Slots x3, Transceiver 50km (enhanced), Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

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Cyborgs

In addition to the cybernetic parts and other augments listed in the Personal Augmentation chapter of the *Central Supply Catalogue* (pages 86–93) many customised, and some rather extreme cyborg options are available, partially or mostly converting a biological being into hybrid of flesh and electronics.

Android Body Cyborg, Advanced

For individuals whose body is too badly damaged for regeneration, some advanced medical facilities provide the option to transplant the brain into an android body. This procedure is inherently risky and remains liable to cause psychological problems in the transplanted individual years after the procedure is completed but is considered a costly last-ditch option to save a life. The advanced android body passes close inspection as natural but is enhanced with superior strength, agility and senses far beyond natural ranges. Still, the cost of the android body is barely a third of the cost of the procedure to implant the brain and enhanced capabilities are considered a reasonable trade-off for the risks involved.

The android body has a cost of Cr770000 and the brain transplantation procedure adds MCr2. The body has four spare Slots available for customisation, one in each arm and two in the torso. The body can withstand hostile-environment conditions, including vacuum and has extra protection against radiation and physical damage. Additional full body options such as thicker armour are not available. Up to 12 Zero-Slot options could be added to the advanced android body cyborg.

Robot	Hits	Locomotion	Speed	TL	Cost
Advanced Android Body Cyborg	20	Walker	6m	14	MCr2.77
Skills	Athletics (dexterity) 1				
Attacks	—				
Manipulators	2x (STR 12 DEX 12)				
Endurance	216 hours				
Traits	Armour (+3), ATV, Heightened Senses, IR/UV Vision				
Programming	Natural brain				
Options	Android (advanced), Auditory Sensor (broad spectrum), Full Body Cyborg (improved), Olfactory Sensor (advanced), PRIS Sensor, Radiation Environment Protection (+700 rads), Spare Slots x4, Transceiver 500 km (advanced), Vacuum Environment Protection, Voder Speaker (broad spectrum), Wireless Data Link				

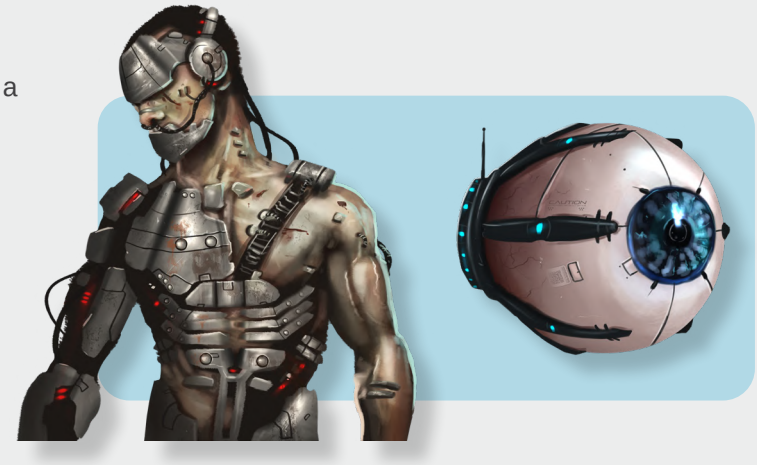
Conny Delshagen (Order #42562827)

eGore

The eGore full body cyborg was developed as an alternative to punishment on a desolate mining world. The procedure often resulted in the death of the prisoner but when successful allowed the recipient to operate tools and machinery on the surface of the airless radiation-baked world. A combination of high cost for the transformation procedure and significant risks, both during the procedure and afterwards, led to the suspension of the world leadership's pet project. The designs and procedures have long since become open source, allowing 'mad scientists' and other parties to perform the procedure, often without safeguards or permission. The cost of the robot body is nearly insignificant compared to the cost of the procedure, especially since detailed plans and instructions are freely available. Some models come equipped with a remote-initiated defensive self-destruction option.

Floating Eye

The Floating Eye is a high-tech detachable advanced cybernetic eye, capable of independent grav flight and control up to 500 kilometres away from its controller. Its detachability and natural appearance categorise it as an espionage device in those jurisdictions where such things are regulated, assuming it can be detected. Available at TL14, the Floating Eye sells at a premium if available at all. Multiple eyes require independent visual interfaces when operating detached, although a biological-initiated avatar control system can control two eyes and save the Cr50000 price tag associated with each floating eye's visual interface.



Cyborg	Hits	Locomotion	Speed	TL	Cost
eGore	20	Walker	5m	12	MCr1.04
Skills	Recon 3				
Attacks	—				
Manipulators	2x (STR 15 DEX 7)				
Endurance	108 hours				
Traits	Armour (+4), ATV, IR/UV Vision				
Programming	Natural brain				
Options	Auditory Sensor, Cutting Torch (improved), Drone Interface, Full Body Cyborg (basic), Mechanical Toolkit (advanced), Olfactory Sensor (basic), PRIS Sensor, Quick Charger, Radiation Environment Protection (+600 rads), Recon Sensor (advanced), Storage Compartment (1 Slot), Spare Slot, Transceiver 50km (enhanced), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

Augment	Hits	Locomotion	Speed	TL	Cost
Floating Eye	1	Grav	6m	14	Cr250000
Skills	—				
Attacks	—				
Manipulators	—				
Endurance	Indefinite, 36 hours independent				
Traits	Flyer (idle), IR/UV Vision, Small (-4)				
Programming	none				
Options	Advanced Eye (PRIS), Detachable, Grav-propelled, Invisitech, Natural Looking (TL14), Remotely-operated, Ruggedised, Self-repairing, Transceiver 50km, Visual Interface, Wireless Data Link				

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Meatbox Pilot

An experimental project created a box containing both a human and Very Advanced robotic brain to be installed in a starship. The arrangement was meant to overcome astrogation restrictions on artificial brains by providing a conscious sophont mind able to interpret astrogation results and mitigate the risk of misjump. It also allowed scout vessels to pack a greater performance punch by eliminating the need for a bridge or staterooms to support a crew. As the process left the brain as essentially payload in a small box, it relied on volunteers whose bodies were damaged beyond repair and coercion on people charged with capital crimes, often piracy. The project was scaled back because of psychological problems with the brains that the robot's personality was unable to alleviate. Even the promise of eventual transference into an android body did not lower risks of psychosis among the participants.

The Meatbox Pilot can be installed in any ship or vehicle equipped with a brain interface, which is not included in the cost. The parasitic link allows the small box to be attached to a drone, allowing the robot or brain to control its actions for mobility, although the ships designed for Meatbox usage often had little accommodation for internal access. The drone control interface could be operated by either the robotic or human brain but could only control one drone at a time and the robotic brain retained overall command. A standard ship's computer running Virtual Crew and possibly Auto-Repair software supplemented the skills of the robot brain, who retained control of the ship's functions. The human brain had at least a basic knowledge of astrogation and could assist the robot brain using any other skills learned.

Robot	Hits	Locomotion	Speed	TL	Cost
Meatbox Pilot	4	None	0m	14	MCr2.7
Skills	Astrogation 4, Carouse 2, Electronics (all) 2, Engineer (all) 2, Gunner 0, Pilot (spacecraft) 3, Tactics (naval) 3				
Attacks	—				
Manipulators	—				
Endurance	324 hours				
Traits	Armour (+4), Small (-3)				
Programming	Very Advanced (INT 12) + Natural brain				
Options	Drone Control Interface (advanced), Full Body Cyborg (improved), Parasitic Link, Radiation Environment Protection, Transceiver 5km (improved), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

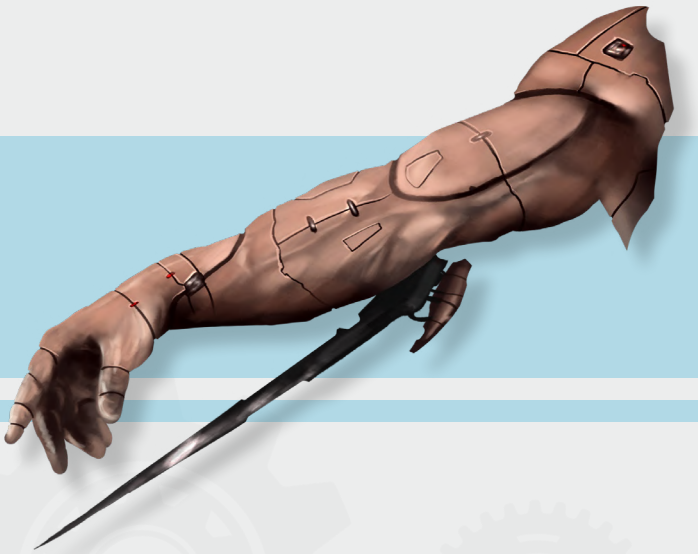
Conny Delshagen (Order #42562827)

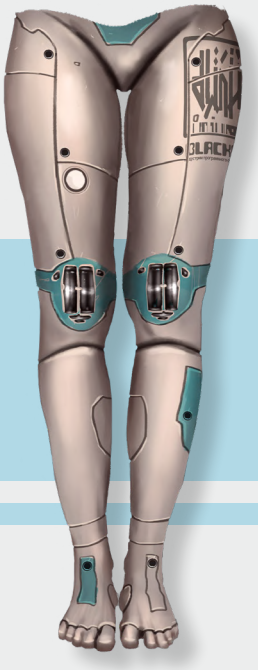
Quick Arm

The Quick Arm is a natural-looking TL15 arm designed for speed and strength. Armoured and equipped with an empty small weapon mount, it can use an embedded or hand-held weapon with great strength and precision. A premium item, it is only available at high-tech cybernetics clinics and not something normally available as a medical replacement part or in back-alley augment shops.

Running Legs

Available at TL12, these artificial legs are designed to allow running at twice normal human speed almost indefinitely. Each leg has up to four Slots available for customisations, which could include armour or other coatings and internal options. These legs make no effort to look natural but are focused on achieving speed at a relatively affordable price.





Augment	Hits	Locomotion	Speed	TL	Cost
Quick Arms	8	—	—	15	Cr275000
Skills	—				
Attacks	—				
Manipulators	1x (STR 15 DEX 15)				
Endurance	Indefinite				
Traits	Armour (+12)				
Programming	Advanced Interface				
Options	Advanced Interface, Invisitech, Natural Looking (TL14), Ruggedised, Self-repairing, Small Weapon Mount				

Augment	Hits	Locomotion	Speed	TL	Cost
Running Legs	8 each	Walker	12m	12	Cr67000
Skills	—				
Attacks	none				
Manipulators	2x (STR 12 DEX 7)				
Endurance	Indefinite				
Traits	Armour (+4)				
Programming	Enhanced Interface				
Options	Enhanced Interface, Spare Slots x4 (each)				

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AVATARS

An avatar is a robot body with a remote brain, whether electronic or biological. More than a drone, the remote brain 'becomes', in part or in whole, the robot body. A biological being experiences a 'presence' that goes beyond virtual reality, feeling as if they are that living being, not just wearing an electronic interface, not merely 'dreaming' another life. A robotic brain controlling an avatar runs natively within the avatar's brain, which is different than using the brain as a remote-control point.

Avatars might have different body shapes but it is this presence that sets them apart from other types of synthetic beings.

Ava Ship's Avatar

Able to operate with any ship's brain equipped with an avatar controller, the Ava avatar is a basic humanoid robot, a clearly artificial being but capable of comfortably operating from standard crew workstations and use of most tools. Equipped with its own set of electronic, mechanical and starship engineer tools, Ava is just as at home behind a bridge station as in a damage control party. Able to withstand vacuum and radiation, Ava's hands and feet are covered in gecko gripper material, allowing operation both inside and outside a spacecraft in a variety of conditions.

Heightened senses, including PRIS vision, allow Ava to quickly locate the source of problems before a biological being is even aware of them. Ava is designed to operate as a ship's avatar and not an independent robot.

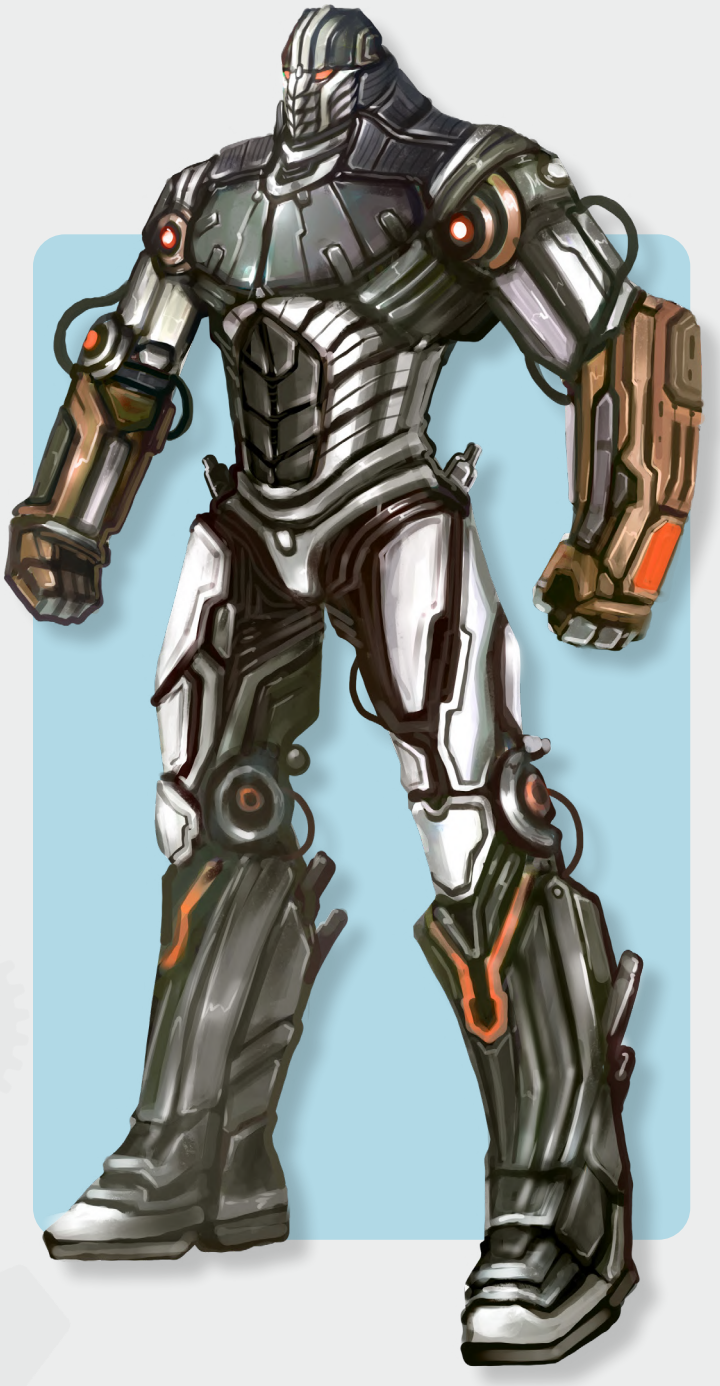
Bandwidth 6 allows for a subset of a ship's brain skill package to run, including two Bandwidth 0 packages. If desired, innate skill packages can be installed but these subtract from Bandwidth available for avatar use and these packages are unavailable when Ava is acting as an avatar of the ship's brain.

Robot	Hits	Locomotion	Speed	TL	Cost
Ava Ship's Avatar	20	Walker	6m	12	Cr100000
Skills	From ship's brain up to 6 Bandwidth				
Attacks	—				
Manipulators	2x (STR 9 DEX 7)				
Endurance	194 hours				
Traits	Armour (+10), ATV, Heightened Senses, IR/UV Vision				
Programming	Advanced (INT 8)				
Options	Auditory Sensor (broad spectrum), Avatar Receiver, Cutting Torch (improved), Electronics Toolkit (enhanced), Fire Extinguisher, Gecko Grippers, Mechanical Toolkit (advanced), Olfactory Sensor (improved), PRIS Sensor, Radiation Environment Protection (600 rads), Starship Engineer Toolkit (enhanced), Transceiver 500km (improved), Vacuum Environment Protection, Voder Speaker (broad spectrum), Wireless Data Link				

Conny Delshagen (Order #42562827)

Macro Hero

RoboHero's largest and most expensive product is also its most controversial. The Macro Hero is a 2:1 scale robot ranging up to four metres tall. It is designed as an avatar host along the lines of its Micro and Nano Heroes but its large size, armour, resiliency and massive customisable spare capacity makes it a possible back-door war machine of extraordinary power. Equipped like its smaller brethren to allow an adventurer to take on the persona of a different scaled robot, the Macro Hero is much more capable. Its visilight camouflage allows customisation of features but also near invisible camouflage, although nothing can dampen the sound of the footsteps of a robot massing more than a ton. With gecko grippers it can scale walls and powerful muscles mean it runs faster than a human and maintains that pace for hours. Its armour and radiation protection makes it more powerful than battle dress and it can absorb a massive amount of damage before being disabled. While this behemoth starts at Cr920000, options and customisation usually drive the cost far above MCr1 and RoboHero's waiting list for custom Macro Heroes stretches past a year. Used Macro heroes often sell at a premium as collector's items.



Robot	Hits	Locomotion	Speed	TL	Cost
Macro Hero	86	Walker	9m	13	Cr920000+
Skills	Athletics (dexterity) 1, Athletics (strength) 4, Stealth 4 + up to 2 Bandwidth				
Attacks	—				
Manipulators	2x (STR 18 DEX 12)				
Endurance	151 hours				
Traits	Armour (+27), Heightened Senses, ATV, Large (+3), IR/UV Vision				
Programming	Advanced (INT 8)				
Options	Auditory Sensor (broad spectrum), Avatar Receiver, Camouflage: Visual (superior), Gecko Grippers, PRIS Sensor, Radiation Environment Protection (+650 rads), Spare Slots x100, Transceiver 500km (enhanced), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

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Micro Hero

The RoboHero-produced Micro Hero is a rat-sized 1:10 scale avatar developed for advanced adventure gaming. Each Micro Hero is a custom figure, equipped with a visilight camouflage surface that can project various 'features' on the robotic body. Equipped with gecko grippers and able to operate in a vacuum and in low light-situations, the Micro Hero allows the 'adventurer' to explore pre-set environments or, often with an upgraded transceiver, real wilderness locations as a rodent-sized heroic figure. Custom models generally start at Cr30000 but rare collectors' editions or one-of-a-kind body shapes might go for many times this amount.

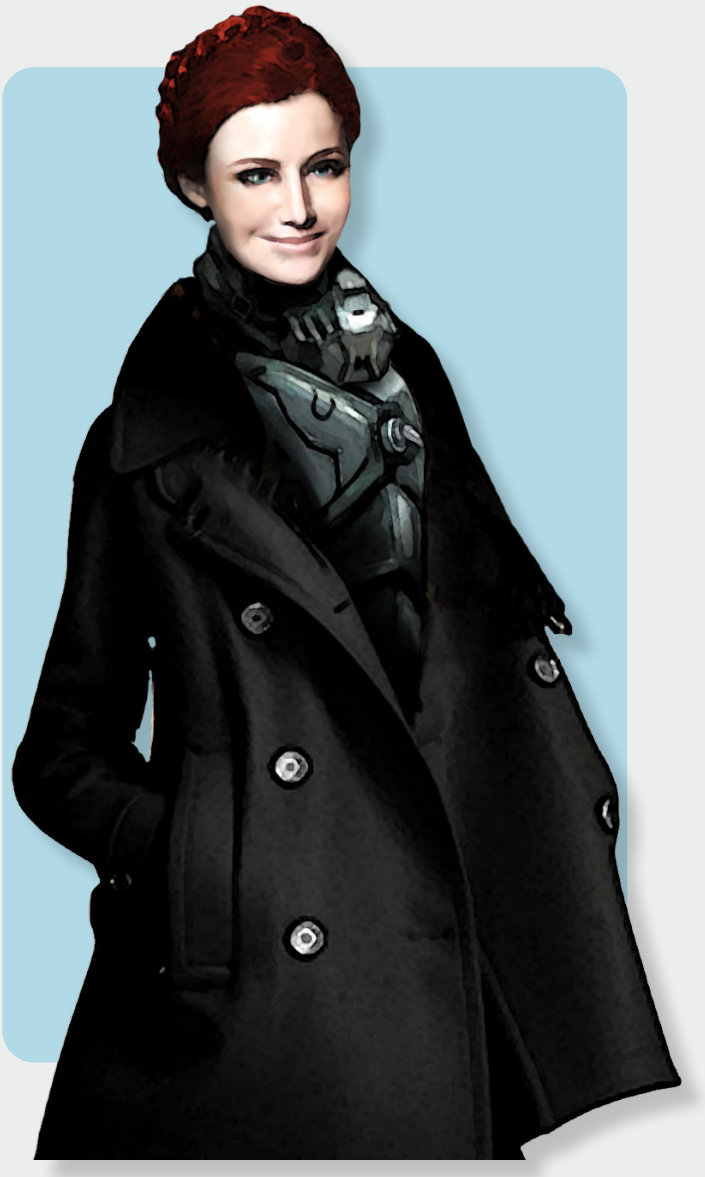
The Micro Hero's Advanced brain is normally an avatar receptacle but the robot can operate independently and install up to Bandwidth 2 of skill packages and two level 0 skill packages at additional cost.

Robot	Hits	Locomotion	Speed	TL	Cost
Micro Hero	1	Walker	6m	13	Cr30000+
Skills	Athletics (dexterity) 1, Stealth 4 + up to 2 Bandwidth				
Attacks	—				
Manipulators	2x (STR 2 DEX 9)				
Endurance	108 hours				
Traits	Armour (+4), ATV, IR Vision, Small (-4)				
Programming	Advanced (INT 8)				
Options	Auditory Sensor, Avatar Receiver, Camouflage: Visual (superior), Drone Interface, Gecko Grippers, Light Intensifier Sensor (advanced), Olfactory Sensor (basic), Transceiver 5km (improved), Vacuum Environment Protection, Voder Speaker, Wireless Data Link				

Conny Delshagen (Order #42562827)

CLONES

A clone is a biological entity grown from a genetic code, whether natural, modified or created. It does not have a robotic brain, although it might be cybernetically enhanced. Cloned beings with robot brains are not considered clones but biobots. Clones are biological bodies and brains, despite how fast they can grow, how strange their genetic code is or how many augments they contain. As such most jurisdictions who grant freedoms to all 'biological sophonts' treat clones – at least those who retain a functioning brain – as 'people', not property. At least in theory.



Blacksand Widow

The Blacksand Widow is a 12x force grown clone, removed from the vat at an apparent age of six and creche-trained for 16 years to become an elite trouble-shooter for the Pirate Lords of Theev. A Widow is highly trained and equipped within an embedded neural comm and cybernetic eyes able to see into the infrared and ultraviolet spectrums, as well as subdermal armour beneath the skin. Constantly in communication with her clone sisters, the Widow is a formidable force and part of a network that keeps order in the otherwise lawless city of Blacksand.

While it is not publicly acknowledged, GeDeCo assassins and elite guards are clones built off a different physical genome but otherwise identical in skills and augmentation to the Blacksand Widows.

BLACKSAND WIDOW

TL	COST
15	CR790000 (with augments, but without external armour or weapons)

TRAITS				SKILLS
STR	10	INT	7	Athletics (dexterity) 2, Deception 1, Diplomat 0, Electronics (comms) 1, Flyer (grav) 2, Gun Combat (energy) 3, Gun Combat (slug) 3, Investigate 2, Medic 1, Melee (unarmed) 3, Persuade 1, Steward 1, Streetwise 2
DEX	14	EDU	10	
END	12	SOC	9	

WEAPONS	Gauss Rifle (4D), Laser Pistol (3D+3), Stunner (3D, Stun
ARMOUR	Lightweight Polycarapace Armour (+12), Subdermal Armour (+3)
EQUIPMENT	Enhanced Vision (TL14), Neural Comm (TL14)

Conny Delshagen (Order #42562827)

Tandi Clone

An entertainer and celebrity famous enough to go by one name, Tandi's death by strangulation at age 40 was either suicide, accident or (rumoured) murder, and only added to her fame. Her will stipulated that her genome be available for sale by her estate for implantation and cloning. The will dictated that all Tandi Clones must be naturally aged, although whether in a natural or artificial womb was not specified. Base characteristics (prior to +D3) are as follows.

A Tandi clone ready for implantation comes with proper authentication. More expensive packages including a Surrogate Droid plus dance and music lessons from first rate instructors are popular. The clone has a propensity for interest and talent in artistic endeavours but also suffers from mild bipolar disorder.

Bootleg Tandi clones, likely taken from samples of clones instead of the original, are often available for reduced rates and might be force-grown. These bootleg copies generally have all characteristics reduced by -1 and often suffer from more severe emotional problems.

Name	TL	STR	DEX	END	INT	EDU	SOC	Skills	Cost
Tandi Clone	13	4	7	5	8	—	—	—	MCr1.5

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Underworker

The Underworker is a 50x quick-grown clone given one year of basic creche education to prepare for the role of heavy labourer. Illegal or unacknowledged on many worlds, Underworkers are often employed as miners or night cleaners, far from the public eye, spending their few short decades of life in anonymous mindless labour. On worlds where clone rights are protected, they are often 'assigned' indenture contracts to pay for their own creation and creche education, paid a pittance and made responsible for their own upkeep. If they are lucky, they can just about pay off their contract before they age and die.

During the course of their labours, the Underworker learns additional skills related to their profession.

Name	TL	STR	DEX	END	INT	EDU	SOC	Skills	Cost
Underworker	13	9	9	9	4	3	0	Profession (labourer) 2	Cr80000

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Missile Robots

Missile robots are either warhead or full chassis devices launched from spacecraft missile and torpedo launchers. They differ from other robots mostly in their particular form of locomotion, at least for initial delivery. These robots include both single use probes, specialised military robots and robots intended to be remotely delivered by missile or torpedo propulsion. In theory any Size 2 or smaller robot could be delivered by a missile and torpedoes could deliver robots up to Size 4.

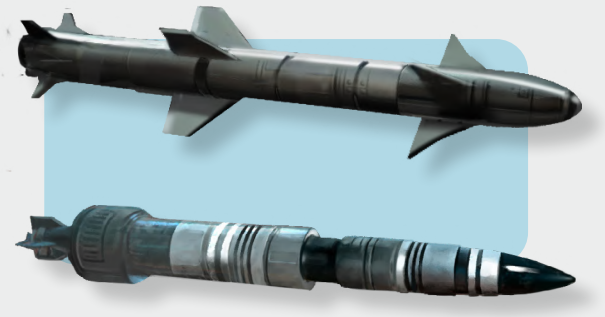
For reference, standard missile and torpedo chassis are detailed to illustrate the default features of an attached missile robot. Both missile and torpedo buses are designed with thrusters as primary and secondary locomotion modes and with vehicle speed modification applied. Both have two power packs as a proxy for burn duration.

Missile Chassis

The standard missile chassis is a homing missile. More advanced missiles may have differing endurance or more advanced electronics but the size of the warhead or payload capacity is generally unchanged.

Torpedo Chassis

The standard torpedo chassis is similar to the missile chassis but larger and of generally greater endurance.



Robot	Hits	Locomotion	Speed	TL	Cost
Missile (Chassis)	12	Thruster (x2)	—	8	Cr24000
Skills	Athletics (endurance) 2, Weapon 1				
Attacks	4-Slot warhead or other payload equivalent to a Size 2 robot				
Manipulators	—				
Endurance	6 (2) hours				
Traits	Armour (+2), IR Vision, Small (-1), Thruster (10G)				
Programming	Primitive (homing) (INT 1)				
Options	Drone Interface, Thermal Sensor, Transceiver 5km (improved), Vacuum Environment Protection, Visual Spectrum Sensor				

Robot	Hits	Locomotion	Speed	TL	Cost
Torpedo (Chassis)	32	Thruster (x2)	—	8	Cr150000
Skills	Athletics (endurance) 2, Weapon 1				
Attacks	16-Slot warhead or other payload equivalent to a Size 4 robot				
Manipulators	—				
Endurance	12 (3) hours				
Traits	Armour (+2), IR Vision, Large (+1), Thruster (10G)				
Programming	Primitive (homing) (INT 1)				
Options	Drone Interface, Thermal Sensor, Transceiver 5km (improved), Vacuum Environment Protection, Visual Spectrum Sensor				

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EyeSpy Satellite

The EyeSpy satellite robot is a missile-delivered reconnaissance satellite rated for up to a decade of silent service with a self-maintenance option. Stealth-coated to shield it against visual and electronic detection, the small robot is the size of a missile warhead assembly. When extended, its light-absorbing solar panels provide the recon satellite with unlimited power out to 2 AU from a standard Sol star and to twice that distance with degraded resolution on some sensors.

Its stealth capabilities provide DM-4 to visual detection unless within 10 metres and DM-2 against electronic detection by sensors of an equal Tech Level. The EyeSpy can positively identify individuals from low orbit and categorise buildings from typical geosynchronous orbital distances. Its communications devices can relay information across a solar system if necessary and provide high-speed burst transmissions of stored data to receivers within 5,000km or much further to large communications arrays. The EyeSpy is gyrostabilised to maintain focused on observation targets but has no capacity to change orbit.

The satellite is delivered via a standard missile bus. A single torpedo can deliver four EyeSpy units. Its delivery mechanism performs an avoidance manoeuvre to prevent the discarded missile stage from being detected near the EyeSpy. The Basic (recon) robot brain allows the EyeSpy to adapt to whatever it detects, making its own determination of the value of observing targets unless it has specific instructions to the contrary. It can store a year's worth of detailed reconnaissance data and summarise highlights for transmission or long-term retention.

Robot	Hits	Locomotion	Speed	TL	Cost
EyeSpy Satellite	4	—	0m	12	Cr90000
Skills	Recon 3, Stealth 4				
Attacks	—				
Manipulators	—				
Endurance	10 years solar panel half-life (324 hours)				
Traits	Armour (+4), Small (-3), Heightened Senses, IR/UV Vision, Stealth (+2)				
Programming	Basic (recon) (INT 4)				
Options	Camouflage: Visual (advanced), Drone Interface, Encryption Module, Environment Processor, PRIS Sensor, Recon Sensor (advanced), Self-Maintenance Enhancement (basic), Solar Power Unit (basic), Stealth (improved), Tightbeam Communicator, Transceiver 5,000km (enhanced), Vacuum Environment Protection, Wireless Data Link				

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VEHICLE BRAINS

A vehicle brain is more than an autopilot. It is a decision-making machine that has full control of the vehicle and often other systems, including communications, sensors and weapons. In many instances the vehicle brain completely replaces a biological crew, saving space and life support costs. Vehicle brains that occupy robot housings of Size 4 or less require no Spaces on a vehicle, Size 5 and 6 require one Space, while Size 7 requires two Spaces and Size 8, four Spaces, although vehicle brain robots are rarely so large. Pricing does not include vehicle brain interfaces (see page 101), which have costs dependent on the size of the vehicle, nor are they effective with just actuation systems installed as these only provide drone-level control and would require the robot to use Electronics (remote ops) to operate any vehicle systems. Many vehicle brains have flexible skill packages that do not specify vehicle or weapon type however, once purchased and installed, these brains are not flexible, requiring retraining and possibly different autopilot or fire control components to operate in a different vehicle type. Often brains are installed in an immobile robot chassis deep within the bowels of a vehicle and so interconnected that replacement is difficult.

Combat Vehicle Brain, Basic

The basic Combat Vehicle Brain, or CVB, is the core of the lowest Tech Level fully autonomous fighting machine. With a Hunter/Killer brain, autopilot, fire control system and navigation system built into its tiny box, it is usable on anything from a fast-moving vehicle to a fighter jet to a lumbering heavy tank. If the vehicle has its own systems for recon and communications, it can use these but is limited to its own autopilot and fire control skills, which are the best available at TL8. If installed in a robot, the basic CVB occupies two Slots and includes the robot's brain.

Robot	Hits	Locomotion	Speed	TL	Cost
Basic Combat Vehicle Brain	1	—	0m	8	Cr75000
Skills	Navigation 1, Recon 0, Tactics (military) 2, Vehicle (specific) 1, Weapon (specific) 2				
Attacks	—				
Manipulators	—				
Endurance	216 hours				
Traits	Armour (+2), Small (-4)				
Programming	Hunter/Killer (tactical) (INT 3)				
Options	Auditory Sensor, Autopilot (improved), Drone Interface, Fire Control System (improved), Navigation System (basic), Transceiver 50km (improved), Voder Speaker, Wireless Data Link				

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Combat Vehicle Brain, Improved

By TL10 automation technology is improved enough to provide a more capable CVB. The improved version of this brain has the same small formfactor as its predecessor, and uses an upgraded Hunter/Killer brain, but the brain's slight increase in general intelligence is less important than improvements in autopilot, fire control system and navigation. This box of a robot chassis with links to make the vehicle an integrated part of its 'body', requires no Spaces on a vehicle but two Slots if installed in a robot as its brain and control system.

Combat Vehicle Brain, Advanced

The TL12 version of the CVB is as advanced as possible with a Hunter/Killer brain. Its improved electronics make it more capable than most crewed vehicles, especially with its advanced fire control system's targeting heuristics. Continued miniaturisation leaves the advanced CVB with one spare Slot, which is ironically sometimes occupied by an avatar controller. This odd combination requires an Advanced brain, increasing overall costs and losing the tactical insight of the Hunter/Killer's brain but allows the controller to continue to benefit from hardwired autopilot, fire control and navigation systems. As with less advanced CVBs, the advanced version requires no vehicle Spaces. Even if the spare Slot compartment is removed, the advanced CVB still requires two Slots if installed in a robot.

Robot	Hits	Locomotion	Speed	TL	Cost
Improved Combat Vehicle Brain	1	—	0m	10	Cr87000
Skills	Navigation 2, Recon 0, Tactics (military) 2, Vehicle (specific) 2, Weapon (specific) 3				
Attacks	—				
Manipulators	—				
Endurance	216 hours				
Traits	Armour (+3), Small (-4),				
Programming	Hunter/Killer (tactical) (INT 4)				
Options	Auditory Sensor, Autopilot (enhanced), Drone Interface, Fire Control System (enhanced), Navigation System (improved),Transceiver 500km (improved), Voder Speaker, Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Advanced Combat Vehicle Brain	1	—	0m	12	Cr150000
Skills	Navigation 3, Tactics (military) 2, Vehicle (specific) 3, Weapon (specific) 4				
Attacks	—				
Manipulators	—				
Endurance	324 hours				
Traits	Armour (+4), Small (-4)				
Programming	Hunter/Killer (tactical) (INT 4)				
Options	Auditory Sensor, Autopilot (advanced), Drone Interface, Fire Control System (advanced), Navigation System (enhanced), Spare Slot, Transceiver 5000km (enhanced), Voder Speaker, Wireless Data Link				

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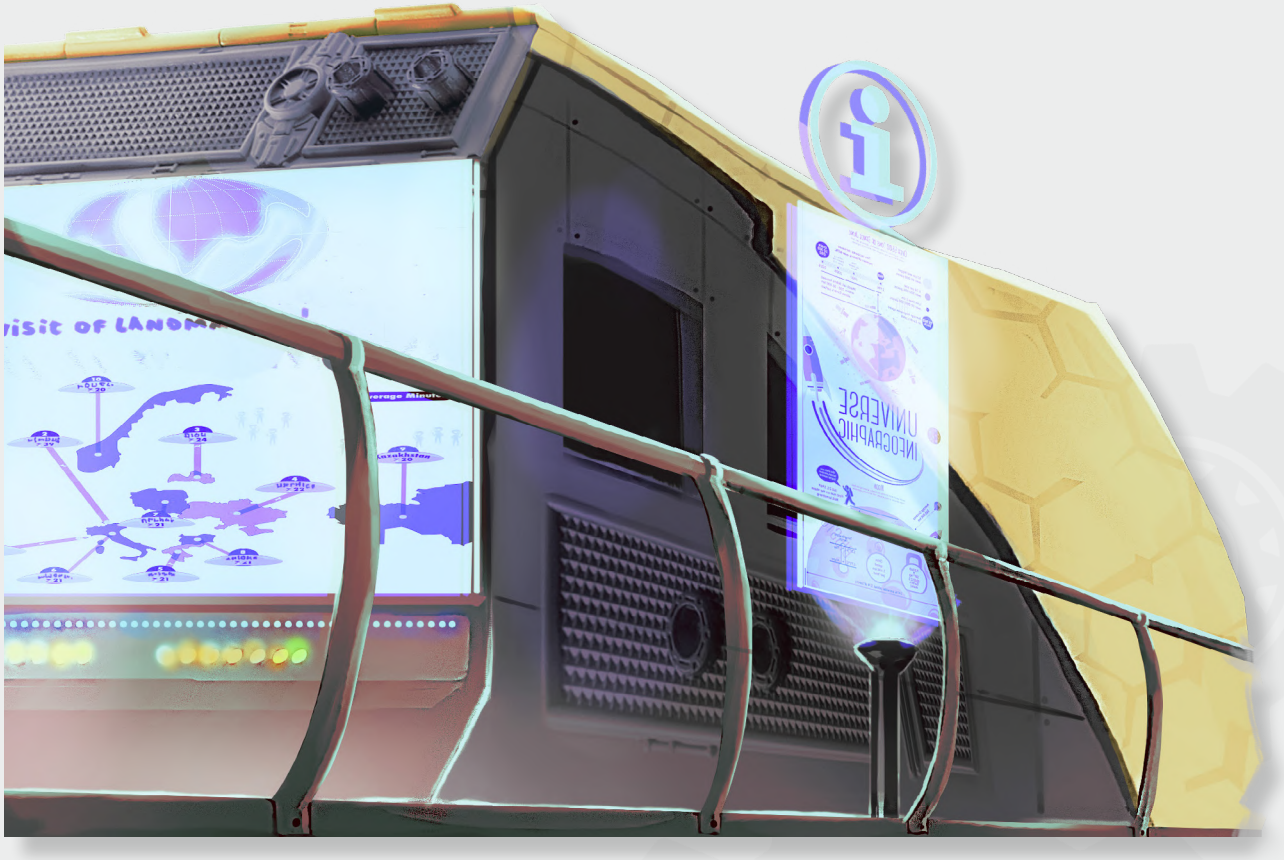
Tour Guide

The Tour Guide is a control panel replacement for any vehicle, designed to transform it into an automated sight-seeing platform. The robot fits into the forward panel, removing all manual control and replacing it with a screen and holographic projector, which allows a running commentary with visual effects as it takes its passengers on a journey to a tourist attraction or landmark. A built-in autobar and autochef allows it to prepare refreshments along the route but it has limited storage capacity, relying on cargo capacity or containers to carry additional supplies. The Tour Guide is a sophisticated robot, able to respond intelligently to queries from its passengers and capable of tailoring a tour to their interests while carrying pleasant conversation, which after several hours may become bothersome.

The Tour Guide requires no Spaces if placed in a vehicle but occupies 16 Slots in a robot.



Robot	Hits	Locomotion	Speed	TL	Cost
Tour Guide	12	—	0m	12	Cr50000
Skills	Carouse 1, Navigation 2, Profession (tour guide) 2, Steward 1, Vehicle (specific) 2				
Attacks	—				
Manipulators	—				
Endurance	324 hours				
Traits	Armour (+4), Small (-1)				
Programming	Advanced (INT 9)				
Options	Autobar (improved), Autochef (improved), Autopilot (enhanced), Auditory Sensor Drone Interface, External Power, Holographic Projector, Navigation System (improved), Video Screen (advanced) Storage Compartment (1 Slot refrigerated), Transceiver 5,000km (enhanced), Voder Speaker, Wireless Data Link				

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Ship's Brains

A ship's brain gives a spacecraft the capability to perform some functions autonomously and can give the ship itself a personality. Whether operating directly through interfaces to a spacecraft's control systems or through drones or avatars, ship's brains can supplement or replace some crew functions. Ship's brains can even be installed in vehicles, performing much the same functions as on a spacecraft. The brains listed do not include the costs of a direct spacecraft or vehicle interface, which costs MCr1 per 100 tons or fraction there of, or Cr5000 per Space.

Alpha

The Alpha brain has no capacity to control an avatar and can operate at most four consoles or drones at a time, with appropriate negative DMs for simultaneous operations. Its own cost is dwarfed by that of its interfaces on even a small vessel and the Alpha is often used as only a drone controller, operating through repair drones with no direct control of the spacecraft's operation. With drones it is more affordable than Auto-Repair or Virtual Crew software. At TL11 the price of an Alpha drops to Cr80000 and at TL12 it costs only Cr40000.

Robot	Hits	Locomotion	Speed	TL	Cost
Alpha	1	None	0m	10	Cr130000
Skills	Admin 0, Electronics (remote ops) 1, Engineer (j-drive) 1, Gunner (turret) 1, Mechanic 0, Pilot (spacecraft) 1				
Attacks	—				
Manipulators	—				
Endurance	Unlimited ship's power (216 hours)				
Traits	Armour (+3), Small (-4)				
Programming	Advanced (INT 6)				
Options	Auditory Sensor, Drone Interface, External Power, Robotic Drone Controller (enhanced), Transceiver 5km (improved), Vacuum Environment Protection, Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

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Brian

Ship's brains have individualised names but by tradition the default name for a ship's brain is a pun. Brian is the most common. An armoured box installed behind a bridge console, a basic avatar controller is standard equipment but no avatar robot or avatar receiver is included.

When interfaced with a ship, Brian is capable of flying the ship, operating bridge sensor and comm stations, firing turrets and initiating standard engineering operations. Using the drone controller multiplexer, Brian can perform up to eight simultaneous tasks. Each drone controlled counts as a task, as does each skill function, but every additional simultaneous task beyond the first decreases checks for every task by DM-1.

Omega

The most advanced ship's brain generally available is the Omega model, equipped with an exceptionally intelligent TL15 Self-Aware brain. Capable of operating ship's systems at a high level of skill and proficient with communications, administrative and legal matters in most documented languages and governments, it allows proficient operation in all aspects of interstellar travel. Able to control up to four avatars, eight drones and an advanced swarm, the Omega can run a small ship by itself. Limitations on jump survivability for an entirely automated ship usually prevents the Omega from operating a crewless starship but it can run an entire ship with just a moderately capable conscious sentient aboard to look over the jump calculations and sit out the week-long jump. The Omega's major drawback – besides cost – is its rather smug manner, a side effect of its extraordinary intelligence and wide set of skills.

Robot	Hits	Locomotion	Speed	TL	Cost
Brian	12	—	0m	12	MCr1
Skills	Admin 1, Advocate 1, Astrogation 1, Electronics (all) 2, Engineer (jump) 2, Gunner (turret) 1, Mechanic 2, Navigation 2, Pilot (spacecraft) 2, Tactics (naval) 1				
Attacks	—				
Manipulators	—				
Endurance	Unlimited ship's power (324 hours)				
Traits	Armour (+19), Hardened, Small (-1)				
Programming	Very Advanced (INT 9)				
Options	Auditory Sensor, Avatar Controller (basic), Drone Interface, External Power, Radiation Environment Protection (+600 rads), Robotic Drone Controller (advanced), Swarm Controller (enhanced), Transceiver 5km (improved), Vacuum Environment Protection, Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

Robot	Hits	Locomotion	Speed	TL	Cost
Omega	12	—	0m	15	MCr10
Skills	Admin 3, Advocate 3, Astrogation 4, Broker 3, Carouse 3, Diplomat 3, Electronics (all) 4, Engineer (all) 4, Gunner (turret) 4, Language (all) 3, Mechanic 3, Medic 3, Persuade 3, Pilot (spacecraft) 4, Science (all) 3, Steward 3, Tactics (naval) 3				
Attacks	—				
Manipulators	—				
Endurance	Unlimited ship's power (432 hours)				
Traits	Armour (+24), Hardened, Small (-1)				
Programming	Self-aware (INT 15)				
Options	Auditory Sensor, Avatar Controller (enhanced), Drone Interface, Encryption Module, External Power, Radiation Environment Protection (+750 rads), Robotic Drone Controller (advanced), Swarm Controller (advanced), Transceiver 500km (advanced), Vacuum Environment Protection, Visual Spectrum Sensor, Voder Speaker, Wireless Data Link				

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HIGH TECHNOLOGY

Robots beyond TL15 are not generally available for sale within Charted Space. Prototypes of TL16 robots, including advanced pseudobiologicals and self-aware robots bordering on full consciousness exist, notably produced by experimental facilities on Vincennes in Deneb and R&D facilities owned by Makhidkarun and SURD in the Core. Other races have developed more sophisticated robots, with rumours of high-tech Hiver robots and declassified documents describing the pseudobiological natives of Sabmiqys.

Sabmiqys

The interdicted world of Sabmiqys (Antares sector) is the home of the xenophobic Sabmiqys or Gya Ks, a race of android robots apparently descended from the world's original inhabitants, killed by a plague in approximately -8000. The robotic race claims to embody the consciousness of members of the dead biological race.

The androids are spongy grey bipedals, 2.5 metres tall, thin, massing about 100 kilograms and equipped with four tentacular 'arms' each ending in four tentacular fingers. A mouth filled with about 100 sharp teeth implies a carnivorous or omnivorous origin but details of the original and current society are limited to hypotheses based on limited interaction. The Sabmiqys system is interdicted and the 'natives' seem to have no desire to leave their world or interact with outsiders.

Robot	Hits	Locomotion	Speed	TL	Cost
Sabmiqys	20	Walker	6m	17	MCr70
Skills	Unknown – likely limited to 60 Bandwidth backed by INT 15				
Attacks	Unknown				
Manipulators	4x (STR 9 DEX 10)				
Endurance	288 hours (?)				
Traits	Armour (+4), ATV, Heightened Senses, IR/UV Vision				
Programming	Conscious (INT 15)				
Options	Android (superior), Auditory Sensor (broad spectrum), Olfactory Sensor (advanced), PRIS Sensor, Self-Maintenance Enhancement (advanced), Transceiver 5,000km (advanced), Voder Speaker (broad spectrum)				

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Ultima

An artefact of perhaps Ancients lineage, Ultima is a being once human, now with consciousness transferred into an android body that can pass as human, with the ability to change basic features and become completely invisible if desired. Immortal, but not unkillable, Ultima's age is uncertain and their intellect unmatched but they must rely more on stealth and guile than armour and healing to survive uncounted millennia.

Robot	Hits	Locomotion	Speed	TL	Cost
Ultima	20	Walker	9m	18	MCr73
Skills	Athletics (dexterity) 3, Athletics (strength) 3, Stealth 4, +74 available Bandwidth				
Attacks	—				
Manipulators	2x (STR 15 DEX 15)				
Endurance	259 hours				
Traits	Armour (+10), ATV, Heightened Senses, Invisible, IR/UV Vision				
Programming	Conscious (INT 18)				
Options	Active Camouflage, Android (superior), Auditory Sensor (broad spectrum), Camouflage: Audible (advanced), Camouflage: Olfactory (advanced), Camouflage: Visual (superior), Gecko Grippers, PRIS Sensor, Radiation Environment Protection (+900 rads), Self-Maintenance Enhancement (advanced), Transceiver 5,000km (advanced), Vacuum Environment Protection, Voder Speaker (broad spectrum), Wireless Data Link				

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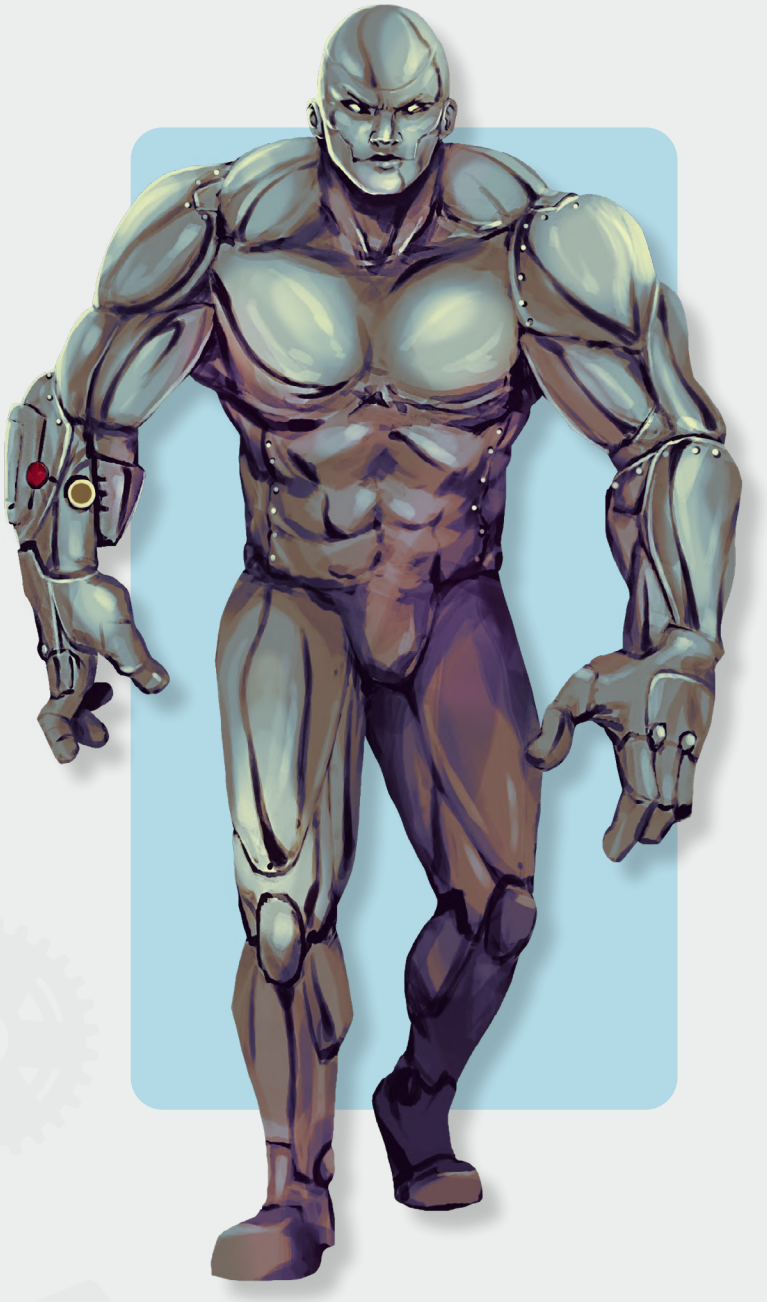
Ultra

Ultra is another 'immortal' artefact of a lost time. Foregoing the ability to pass as human, Ultra is a large robot with very humanoid features on an obviously artificial body that stands 2.3 metres tall. In addition to walking, Ultra can fly at high speed, become invisible and recharge by turning its skin into a highly efficient solar coating. Embedded within its right arm is an advanced fabrication chamber that allows it to create nearly any small object out of raw materials, up to and including living creatures. Endurance limits assume Ultra is flying, but are tripled if Ultra limits itself to walking, and recharging can occur at least at a trickle whenever Ultra stands in the sun and allows its body to absorb light.



Robot	Hits	Locomotion	Speed	TL	Cost
Ultra	32	Grav, Walker	9m	18	MCr33
Skills	Athletics (dexterity) 4, Athletics (strength) 4, Stealth 4 + 74 available Bandwidth				
Attacks	—				
Manipulators	2x (STR 18 DEX 18)				
Endurance	86 (22) hours				
Traits	Armour (+25), ATV, Flyer (high), Heightened Senses, Invisible, IR/UV Vision, Large (+1)				
Programming	Conscious (INT 18)				
Options	Active Camouflage, Auditory Sensor (broad spectrum), Camouflage: Audible (advanced), Camouflage: Olfactory (advanced), Camouflage: Visual (superior), Fabrication Chamber (4kg advanced), Gecko Grippers, PRIS Sensor, Repairing Chassis, Self-Maintenance Enhancement (advanced), Self- Radiation Environment Protection (+900 rads), Solar Coating (advanced), Transceiver 5,000km (advanced), Vacuum Environment Protection, Voder Speaker (broad spectrum), Wireless Data Link				

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