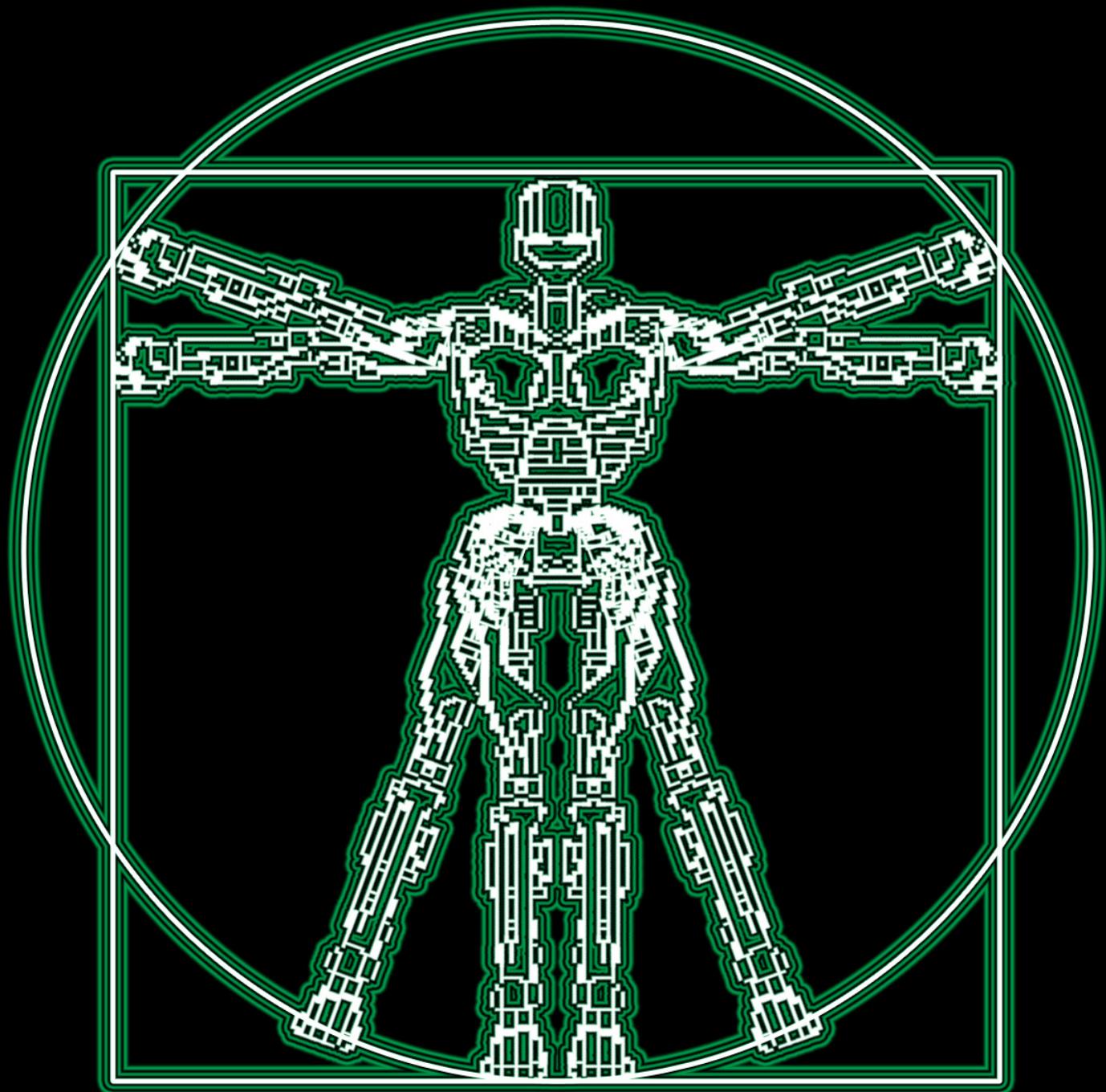


ALTERNITY[®]
Science Fiction Roleplaying Game

FOUNDRY

A GUIDE TO ROBOTS, ANDROIDS AND AUTOMATIONS



IVO ELEZOVIĆ



ALTERNITY®

Science Fiction Roleplaying Game

FOUNDRY:

A GUIDE TO ROBOTS, ANDROIDS AND AUTOMATIONS

BY IVO ELEZOVIĆ

Being a comprehensive catalogue of robot systems and
a technical guide to assembling one.

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HK-47, for giving me focus

Based on the ALTERNITY® rules created by Bill Slavicsek and Richard Baker

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HK-47: Statement: HK-47 is ready to serve, master.
Revan: You don't need to call me master, you know.
HK-47: Query: Don't I? I was under the assumption that organic meatbags such as yourself enjoyed such forms of address.
Revan: "Organic meatbags?"
HK-47: Retraction: Did I say that out loud? I apologize, master. While you are a meatbag, I suppose I should not call you as such.
Revan: You just called me a meatbag again!
HK-47: Explanation: It's just that... you have all these squishy parts, master. And all that water! How the constant sloshing doesn't drive you mad, I have no idea...
Revan: Neither do I, come to think of it...
HK-47: Statement: Now do you understand the travails of my existence, master? Surely it does not compare to *your* existence, but still...
Revan: I survive. Somehow.
HK-47: Commentary: As do I. It is our lot in life, I suppose, master. Shall we find something to kill to cheer ourselves up?

To Rhino, may he GM for a hundred more years.

1. TABLE OF CONTENTS

1. Table of Contents	3	Tables	
2. Introduction	4	3.1. Robot Sizes	10
2.1. History	4	3.2. Robot Size Consequences	10
2.2. So, what's new here?	5	3.3. Chassis Points per Size and constitution score	10
2.3. Let's get started!	5	4.1. Hero Monetary Restrictions	11
3. Design	6	4.2. Chassis Materials	11
3.1. Defining the Progress Level	6	4.3. Power Supply Systems	13
3.2. Concept	8	4.4. Other Power Systems	14
3.3. Size and shape	8	4.5. Processors and Relevant Info	15
3.4. Obedience	8	4.6. Other Processor Systems	15
3.5. Durability and Chassis Points	9	4.7. Actuators and Relevant info	17
4. Systems	11	4.8. Cabling and Relevant Info	18
4.1. Chassis	11	4.9. Sensor Systems	20
4.2. Power supply	12	4.10. Data Port Systems	22
4.3. Processors	14	4.11. Manipulator Systems	24
4.4. Actuators	17	4.12. Propulsion and Relevant Info	25
4.5. Cabling	18	4.13. Casings and Relevant Skills	27
4.6. Sensors	19	4.14. Weapon Support Systems	29
4.7. Data Ports	22	4.15. Defense Systems	30
4.8. Limbs	22	4.16. Miscellaneous Systems	32
4.9. Manipulators	24	5.1. Perks	36
4.10. Propulsion	25	5.2. Flaws	39
4.11. Casing	26	5.3. Physical Skills	43
4.12. Weapon Support	28	5.4. Mental Skills	43
4.13. Defenses	30	5.5. Robot Brawling Damage	44
4.14. Tools	32	8.1. System Failure Skills	59
4.15. Miscellaneous	32	8.2. Robot-Cop Failure Example	59
5. Statistics	34	Sidebars	
5.1. Profession	34	CIMDR 13 Systems	45
5.2. Attributes	34	CIMDR 13 Skills	45
5.3. Perks	35	Voyager 3 Systems	46
5.4. Flaws	38	Voyager 3 Skills	46
5.5. Skills	42	Robot-Cop Systems	47
5.6. Other	44	Robot-Cop Skills	47
6. Examples	45	SSARR 0A Systems	49
6.1. CIMDR 13 (PL 5)	45	SSARR 0A Skills	49
6.2. Voyager 3 (PL 5)	46	XCPMR Systems	50
6.3. Robot-Cop (PL 6)	47	XCPMR Skills	51
6.4. SSARR 0A (PL 6)	48	BSR 9 Systems	51
6.5. XCPMR (PL 7)	50	BSR 9 Skills	52
6.6. BSR 9 (PL 7)	51	SRD X Systems	52
6.7. SRD X (PL 8)	52	SRD X Skills	53
6.8. Albert (PL 8)	53	Albert Systems	53
7. Special cases	55	Albert Skills	54
7.1. Robots and Cyberware	55		
7.2. AI Specifics	56		
7.3. Special builds	57		
8. System Damage, Maintenance and Upgrading	58		
8.1. System Failure	58		
8.2. System Check	60		

2. INTRODUCTION

foun·dry, n., pl. -dries.

1. An establishment where metal is melted and poured into molds.
2. a. The skill or operation of founding.
b. The castings made by founding.

From TechEncyclopedia: Foundry - A semiconductor manufacturer that makes chips for third parties. It may be a large chip maker that sells its excess manufacturing capacity or one that makes chips exclusively for other companies. As of 1995, it costs at least a billion dollars to construct a high-production semiconductor manufacturing plant that produces standard chips.

ro·bot, n.

1. A mechanical device that sometimes resembles a human and is capable of performing a variety of often complex human tasks on command or by being programmed in advance.
2. A machine or device that operates automatically or by remote control.
3. A person who works mechanically without original thought, especially one who responds automatically to the commands of others.

[Czech, from robota, drudgery, forced labor; "rob", slave.]

an·droid

adj. Possessing human features.

n. An automaton that is created from biological materials and resembles a human. Also called humanoid.

au·tom·a·ton, n., pl. -atons or au·tom·a·ta /-m&-t&, -m&-tän/

Pronunciation: o-'tä-m&-t&n, -m&-tän

Inflected Form(s): Etymology: Latin, from Greek, neuter of automatos

- 1 : a mechanism that is relatively self-operating; especially : ROBOT
- 2 : a machine or control mechanism designed to follow automatically a predetermined sequence of operations or respond to encoded instructions
- 3 : an individual who acts in a mechanical fashion

2.1. History

The idea for this project was born the day I decided to play-test a robot hero. A week later, with my character sheet finally finished, after liters of sweat and blood poured trying to figure certain specific parts of the rule set, I asked myself: "Was it worth it?"

Wolfgang Baur did a tremendous job at laying the foundations for the AI design, robot design, and software design in *Alternity*, and of all these, the robot design was most troublesome. The reasons may be numerous, from lack of detail, horde of typological errors to vague generalization. Yet, only when one begins to create a new system does he learn to appreciate every single number and calculation the last one offered. So I thank Wolfgang Baur for all of his work, and I must add: *Dataware* was an inspiration, a buggy one, but inspiration nevertheless.

Reasons the rules presented in **Foundry** are the way they are - perhaps may seem complex or illogical to the first glance:

Somewhere in May 2006, I went as usual to the *AlternityRPG.net* web-pages and saw a chat log that included Neil Spicer's resolve to make another attempt at creating an alternative system for robot creation, a system that followed the *Warships* rules by using the so-called Frame Points. However, after I reviewed his work, I found that we shared some major differences in opinions on how robots should be built. Neil Spicer was proposing the Little Difference method, where a robot would have a specific number of Frame Points (ala *Warships*). The size of the robot would affect their number, but very slightly. Constitution would be the main factor for the Frame Point number and the higher the constitution the higher the amount of Frame Points. Overall difference in Frame point number between diminutive and huge robots was perhaps 50% or so. I disa-

greed strongly with this approach, as I was looking for a truer copy of the *Warships* system; a small robot should be an analogy to fighter-ships, while huge ones would be fortress ships. The difference in Frame Point number would be exponential, and constitution would modify the amount of Frame Points but very slightly. Also, the higher the constitution, the less space there would be left for systems - opposite of the method Neil used. This was the Big Difference approach to the problem due to exponential increases in Frame Point values, and after we couldn't decide which system would be best I chose to develop the Big Difference method fully and let the players decide.

I argued for streamlining the rules to match, where applicable, those from the *Player's Handbook*. Neil developed Firmware sets and a complete new system for buying skills in a robot, where I argued that current professions should be used because they were usable in the situation, widely accepted as bug-less, and finally known to anyone. Both ideas had merit so I decided there was no need to change that aspect of robot creation and that even *Dataware* took too big a step away from the core rules, at least on this issue. The last reason I remember for splitting this project off was the question of attribute points. Neil would increase the number through the Progress Levels, where I decided to stick with the *PHB* 60, no matter what, in order to make the robot heroes comparable to non-robot ones. Of course customization is possible in every aspect of these rules, and they are highly modular.

With the general idea of how the system would work in place, I started collecting existing systems and ideas from a lot of different sources: *Dataware* being the first and foremost inspiration (and a foundation), and *Warships* being the second. There were dozens of systems in both books that were compatible with my idea and I tried to fuse them into a third. The result lies in front of you; hopefully I have managed to make robot creation an enjoyable experience for every hard-core *Alternity* player.

2.2. So, what's new here?

Foundry introduces some things, changes others, and dumps the third in favor of fourth. Let me give you some examples. There are robot Chassis Points determining how much space for systems a robot has. Each piece of hardware has a certain size in Chassis Points, and if the system is big it probably won't fit inside a tiny robot. Via *Dataware* rules, it was perfectly viable to have a 10 cm tall robot using hydraulic actuators and covered in super-heavy neutronite armor, packing a rocket launcher and capable of lifting half a ton. This was because there wasn't a robot system size defined, only its weight. Naturally, a GM could overrule the player trying to create such a robot but there wasn't anything explicitly preventing it in the rules.

Attribute point deployment is also different than before - direct *PHB* 60 points. Skill purchases and professions have also been synchronized with *Player's Handbook*. Each and every part of the robot structure has been (re)defined, and a ton of new ones have been added. And finally, robots can now buy upgrades through a system very similar to cyberware equipment on a normal hero, but are limited to a number of systems by a triple self-regulating mechanism: amount of space, amount of available power, and finally the monetary cap. In the following chapters You will undoubtedly recognize many robot systems that originated from standard cyberware equipment and will learn how they are controlled.

One more major difference: Robots are not cheap. They should never have been cheap; this was a big mistake in the first place. Via *Dataware* rules, a good robot hero cost about \$20K-\$40K, depending on the options, while standard robots have been as cheap as \$5K. While this may make sense for a standard drone, a robot hero cannot and should not be this cheap. All the prices have been raised by a certain factor, from 10 up to even 100 times. No matter how small a Mass Reactor gets, it's still very, very expensive equipment and a high-grade robot should be a long-term investment, rather than a convenience. Power supplies were previously taken for granted by *Dataware*. You will still be able to create very cheap robots using other systems, like battery packs, but they won't be able to have the options nor attributes that are usually required for heroes. This revision is very similar to what was done in *Warships* where a starship ceased to be a commodity and became something that if bought should be repaid for a decade and used for possibly centuries. Much like buying a private jet is today. I stress again, a robot is not a commodity like a microwave oven is and it never will be, at least not a hero-grade robot.

There is another reason the prices of all parts, mandatory and optional, were raised: game-play balance. In order to solve the question: "Why can't a robot upgrade everything and raise his statistics to maximum through these and those upgrades", I decided to make it in fact possible, but at an extreme monetary cost (needless to mention - available space is also a very powerful limiter). A human or some other biological species can upgrade itself only so far through cyberware equipment enhances, but robots could theoretically pursue this to impossible heights. How much is blind-sight worth to a biological hero? The ability to sense in absolute dark? By *Dataware* rules - 900 credits. I found this and many other issues broken and have hopefully fixed them.

2.3. Let's get started!

In order to create a robot through **Foundry**, you need to follow a certain algorithm. You have already used a very similar one for creating other heroes in *Alternity* games, and here it is:

1. Define Progress Level
2. Draw a concept
3. Define size and shape
4. Define durability
5. Choose systems
6. Choose profession
7. Distribute attribute points
8. Choose perks and flaws
9. Distribute skill points
10. Fill out the holes on the character sheet

It may seem easy at the first glance and I might say: "Well, it is!", while in fact you are going to be choosing through almost a hundred and eighty different systems and over sixty perks and flaws. Fortunately, if you follow the algorithm closely, it won't take *much* time. If you define a proper robot concept, then you should have no problems or dilemmas at picking proper equipment or skills later.

Good luck!

3. DESIGN

PL6: The Fusion Age

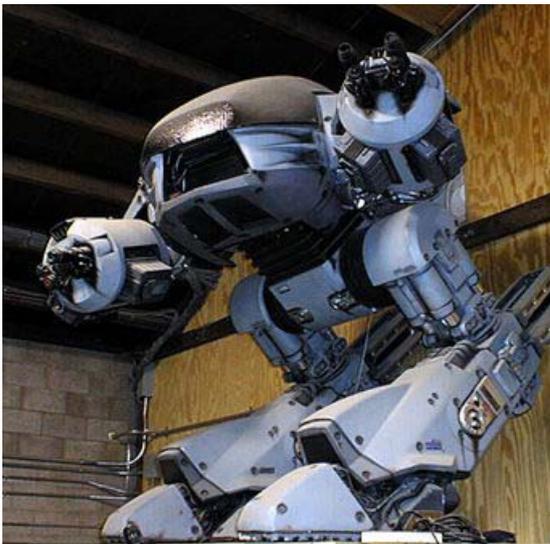
3.1. Defining the Progress Level

The first notion about constructing a robot is the Progress Level it is constructed in. Some robot functions and parts may not be available at a certain Progress Level, while other previously available become rejected as obsolete through time. To help you determine which Progress Level builds what kind of robots, here's a rundown:

PL5: The Information Age

The first robots are those machines that fell under the definition: "Stand-alone hybrid computer systems that perform physical and computational activities". This definition stays true to Progress Level 8. A robot is a multiple-motion device with one or more arms and joints that is capable of performing many different tasks like a human. Such a device can be designed similar to human form, although most industrial robots don't resemble people at all. Robots at Progress Level 5 are designed for a multitude of simple applications. In manufacturing, they are used for welding, riveting, scraping and painting. They are also deployed for demolition, fire and bomb fighting, nuclear site inspection, industrial cleaning, laboratory use, medical surgery (via telepresence links), agriculture, forestry, office mail delivery as well as a myriad of other tasks. Increasingly, more artificial intelligence is being added. For example, some robots can identify objects in a pile, select the objects in the appropriate sequence and assemble them into a unit. These functions remain simple, as their adaptive intelligence - capability to function outside their assigned role and location - is minimal.

PL5 robots are not viable heroes. In most cases these robots are not mobile or even partially humanoid, and are assigned to a single task. The PL5 robot mental capabilities remain too limited to ever function on its own, autonomous from some central controlling station. Further problems are linked to power supply, speed and dexterity issues, enormous weight, frequent software 'crashes', and related maintenance costs.



ED-209, *Robocop*, 1987. Typical PL5 robot, always crashing and quite badly constructed. Note the refrigerator unit on its front as an example.

The "Dumb Bots" of the Fusion Age were not so called because they were incompetent in any way, at least not in their areas of expertise. With the computer advances, miniaturization, new power supply sources, and more efficient manufacturing processes that result in lightweight robots, the competency of a PL6 robot is sometimes even comparable with an expert on a chosen field. These robots use improved techniques like integrated databases, neural networks and expert systems to actually learn from their mistakes and use that experience later. However, this only applies to the robot's chosen field; the one it was designed to function in. They are called "Dumb Bots" because only the top-of-the-line robots could work efficiently if cut off from human support, maintenance, or intervention. Their adaptive intelligence is still too low to direct their behavior in a completely new or unexpected situation.

A PL6 robot's mental faculties are still sub-par compared to its creator. Its skill-sets are improved and are able to perform a wider variety of primary functions but are still very dependent on regular control and maintenance. Though they can carry and use a broader set of tools and equipment PL6 robots are not good heroes. They can be played as player characters, though if played true to their form such role-play will not be easy or enjoyable. They make much better supporting cast members than PL5 robots though.



T-800, *Terminator 2*, 1991. Excellent PL6 Combat Spec, very limited at personality issues and other inter-human relationships.

PL7: The Gravity Age

The Gravity Age brings great changes into robot construction, their functions, and their acceptance into society. The first truly independent robots are created in the beginning of the gravity age. Functions like "autonomous exploration robotic vehicle" become common robot designations, and some robots indeed are able to spend almost indefinite amounts of time without third-party maintenance or instructions. During the gravity age great advances are made on the AI miniaturization field and pseudo-AI behavioral coding. Such advances in programming bring ethical questions about the legality of owning robots with pseudo-AI systems, and to the end of gravity age more and more robots are emancipated or freed by their masters. The true AI crystal lattice systems are still too big to fit inside a robot, so, technically speaking, pseudo-AI robots of the gravity age are not fully sentient, and do not experience human emotions. However with the behavioral coding installed they are quite capable of emulating a personality, for at least some time before it becomes obvious that a person is holding a conversation with a robot.

A PL7 robot is a fully adaptable, independent, and intelligent enough to be played as a hero. Its social skills may be a bit behind its creator's or a true AI's system, but other faculties more than compensate. Literally any function can be performed by a PL7 robot and the creator can rest assured that the robot is capable of at least trying to find answers to questions on its own. The sophisticated inner systems require less maintenance than ever before, and the learning algorithms provide the robot with the means to keep its skills on par with its biological counterparts. Emancipated robots can own establishments, run various kinds of business, and serve as heroes without attachments. In fact, an emancipated robot is strongly suggested to be considered as a hero. However, since the PL7 robots are still not overly ambitious, even when freed they often remain loyal to their previous masters and remain in their service.



Kryten, *Red Dwarf*, 1988-1999. A true example of a PL7 robot trying to overcome its programming.

PL8: The Energy Age

The Energy Age robot can for the first time be paired with an independent AI system that would fit inside its chassis. This results in full self-consciousness and human-like emotional responses via emotion-modeling hardware. Such robots, however, are created only when actually needed and they basically transcend the definition of robot and become androids, at least where mental systems are concerned.



Cherry 2000, *Cherry 2000*, 1987. The advances in science, Cherry 2000 features a PL8 synthetic tissue skin. However "she" doesn't have an AI.

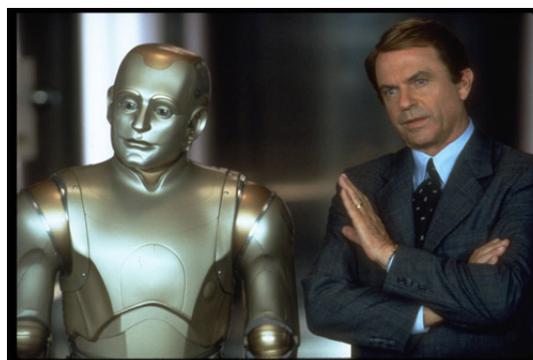
No matter the age there is always a need for "Dumb Bots" without higher functions, so common PL5 automatons can still be found. The Energy Age, fully sentient robot brings even more problems as far as robot rights are concerned, and such problems can have a wide variety of solutions, from peaceful integration into society to wide-scale nuclear war for world dominance. By the end of the Energy age, progress is made into synthetic tissue and advanced cyborg systems, where AIs could use synthetic human-like bodies instead of the crude metal chassis of the past. The cybrid system is a step to that goal where only a part of the AI can be downloaded into a cyborg body, which resembles a human in almost every aspect but is entirely synthetic.

A PL8 robot is superior to a biological hero in almost every respect. Its inner systems are far more efficient, and such a robot can pack and use more tools and systems at the same time than a non-robot ever could. A PL8 robot hero is not lacking in anything, from social faculties to logistics and maintenance, having ultra efficient systems that basically never break down on their own. Such a robot can be an excellent hero or an even better villain or supporting cast member.

PL9: The Matter Age and beyond

During the Matter Age the fragile crystal lattice that was mandatory for every AI system is finally left behind and AIs are capable of downloading directly into human-like, positronic brains, which reside in synthetic human-like bodies; leaving, if they desire to do so, all mechanical parts behind. With direct duplication of all human cells, including the ability to procreate, the line between a biological being and an artificial life form is finally erased. Other AIs leave standard processors for even more advanced quantum processors, and the process of transferring consciousness into a positronic brain is also used by those humans that desire to change their body for a synthetic one. In this way the limits of mortality are finally transcended, through a fusion of both biological and artificial life forms, and their mutual cooperation.

A PL9 "robot" is always fully self-conscious. Even those machines that perform the most basic of tasks have at least pseudo-AI patterns that allow them to emulate living beings when required. The PL9 robot may or may not have certain rights, depending on the setting. A Matter Age robot is not a viable hero. Its mental functions far supersede biological heroes, coordination between brain and limbs is controlled at the speed of light or faster, and it possesses physical attributes that are far superior to a biological hero.



Andrew Martin, *Bicentennial Man*, 1999. Andrew is a PL9 robot that succeeded in becoming a true human.

Once you have reviewed and settled on a Progress Level, or have the Progress Level set by a setting, continue to develop a concept.

3.2. Concept

- Revan:** Whoa, slow down there. Yes, I did purchase you...
- HK-47:** Explanation: Then you qualify as my master and I must refer to you as such. The legal requirements for models of my type are very specific, master.
- Revan:** What legal requirements do you mean?
- HK-47:** Answer: Simply that the distinction between 'killer' and 'killee' be a clear one. I cannot kill of my own volition, naturally.
- Revan:** I don't think 'killee' is a word.
- HK-47:** Expletive: Damn it, master, I am an assassination droid... not a dictionary!

Every robot out there has (or once had) a reason it was built. Unlike biological creatures, robots are made with their purpose clearly defined far before their parts are assembled. What does the robot do? What is its function? What shape is the most efficient form for it to perform its duty? These are the classic questions you need to ask yourself before you begin the process of assembling a robot. The function a robot may perform may go from warfare, exploration, industry, protocol, education to anything else you can think of, that would benefit from having a robot doing it. As time goes by, at higher Progress Levels, borders between those functions become more and more fuzzy and it is quite possible for a robot to perform two or more of these quite distinct basic tasks. At Progress Level 7 it is common to see a robot that is both an explorer and a scientist, or an educational, administrative and protocol robot at Progress Level 8.

You need to envision the primary reason your robot was built and what are its primary skills. Is it good at warfare? If so, what weapons does it use? In case of a technical job, is the robot a technician, a scientist, a medic, or perhaps all of these and more? In case of a pilot, what vehicles does it operate, and how? A protocol robot, for example, may be skilled in many different areas of expertise, from law, administration, education, entertainment and bureaucracy.

Remember the limitations of the Progress Levels. Talk with your Game Master, and ask him for advice. A robot hero can be influenced by several examples from many movies and TV series. Beware: there are many extremes and some may be difficult to role-play properly. Examples may vary from paranoid AI IBM 8000 system that was put inside a body, to a cowardly protocol robot that shuts down at the first sound of gunfire. Take care to be sure your hero can fit into the general story and is compatible with other heroes. Ask your GM for advice if you are caught in a dilemma.

3.3. Obedience

- Exile:** You don't need to call me master.
- HK-47:** Statement: Oh, I am aware of that, master. I simply use it to give you the illusion of control and obedience. Humans often need such comfort till the end comes.
- Exile:** What do you mean, "The End"?
- HK-47:** Consolation: Master, everyone dies eventually, and not all of them by my hand. Even droids die when not routinely maintained, sadly enough.
- Exile:** But until you do, you answer to me.
- HK-47:** Statement: Of course I do, master. Till the end.

The robot is or was someone's property. While it is possible for a high Progress Level robot to be created as a free individual, with a true AI installed, it is rarely the case. The robots are expensive, too expensive to simply build them and let them free out of benevolence. You need to determine whom the robot belongs to - an individual who purchased it as an investment, an organization which ordered it to save on long-term employee expenses, or perhaps the robot is a property of a government, in case of a law-enforcing or military model. It is very possible that some rich AI would buy robots as it feels more secure with a robotic work force. The decision may have long-term consequences on the game-play development.

An emancipated robot may not necessarily be a free one. It may be indebted to that entity that emancipated it, or could simply have its status not recognized by the law. That can be quite common in undeveloped societies, where a robot is considered a tool and a property no matter its mental status and self- or pseudo- conscience.

The robot should ultimately obey its owner. These programming quirks need to be specifically stated before introducing a robot into the game. Is the robot programmed to always obey orders or only when the orders are not self-destructive? What kind of orders does the robot have to obey - only ones received through a data port, or any it receives from any means? Is the robot allowed to disobey the order if it would be harmful to its owner? Who are its authorized users - only the owner or a group of people, or everyone? Can the robot refuse an order if it's impossible to accomplish, or will it be stuck in a programming loop? Again, all these, and more, are questions which should be addressed before introduction to any game.

3.4. Size and shape

Once a robot's functions are generally decided, you need to focus on envisioning its shape. What is the best shape for its job? The size may vary from under five centimeters up to (and over) three meters, and though all sizes have their uses, extremes have very specific disadvantages. A very small robot may be ideal for crawling up shafts and repairing inaccessible equipment, though it may easily be destroyed, even accidentally, if someone steps on it. A very large robot on the other hand may be an ideal warrior, equipped with dozens of different weapon systems, half of them integrated and hidden from view, but if it can't enter a building except through the delivery hover-truck doors it's going to have problems sooner or later.

After defining size, shape is also important. Does the robot have, or even need, legs? Will tracks or wheels suffice? Perhaps it is best if it simply floats through the air? How many arms, if any, will it need to perform its primary tasks?

Will it have a head? These are all viable options and even more are possible. Perhaps the robot has a very special reason to have six arms and four legs. Whatever the case may be, if it can be envisioned, it can be constructed. There are no limits on how the robot looks, except aesthetics, efficiency and imagination. A surgeon-robot may need six arms, but those are not of much use to a warrior-robot if it can't use them all at the same time precisely. See **Chapter 4.8 - Limbs** for more information on limb mechanics.

Thus, envision the robot with what you think it needs. More is not necessarily better. Six legs would make a robot very stable but it might be aesthetically unpleasing, and would require quite a bit of power and chassis space to install and run properly. This is as good a place as any to get familiar with potential propulsion methods, so take a peek at **Chapter 4.10 - Propulsion**. As you will see, a robot's number of limbs is an important factor in a number of possible propulsion methods.

For most functions small to medium sized robots are best. Anything below 50 cm and over 2 meters high should not be allowed as a hero. An extreme sized robot might be an ideal supporting cast member, serving as a guard, or a very simple and useful repair tool carried by someone at all times. Most ideally a robot hero should have a simple propulsion system like legs or tracks, or even possibly gravitic engine allowing it to fly. Also, a robot hero that is humanoid in shape can possess a number of advantages, most notably the possibility of equipping humanoid size equipment, from weaponry to environmental suits.



Robby the Robot, *various appearances*, 1956-2005. This typical PL5 robot was built in 1955 for \$125,000, and after a few movies has been mostly gathering dust in Orange County movie museum. Quite an example of a robot with a Celebrity perk, for all the good it did him. Medium size, quasi-humanoid shape, two arms with manipulators, two legs with feet propulsion and no obvious head.

3.5. Durability and Chassis Points

Like every hero, supporting cast member, or creature, a robot has a durability score. This score is defined by the robot's constitution. Not all robots can handle equal amounts of stress, abuse or pounding with a very heavy blunt object. Nor should they. A very delicate scientist-robot with lots of integrated measuring tools and other professional equip-

ment certainly should not need cerametal reinforcements or redundant motivators, unlike, perhaps, its warrior-robot counterpart. This will reflect in its lower constitution score, and thus lessened durability. However, not needing that extra protection, the scientist robot will have more free space inside it to install other tools and equipment. This issue of free space is a key issue in constructing a robot and has to be thought over very carefully. More space or more durability? Once you read through this chapter you'll hopefully have a more precise view of how to correctly calculate what your robot needs.

The durability track is calculated the same as for any other (normal) biological hero. The robot will have Stun and Wound points, which are determined from the robot's CON attribute score. The robot's number of Mortal points are equal to half its CON attribute score, rounded up. Robots do not have a fatigue rating, except when specifically stated.

Thus, a robot with constitution score of 13 would have 13 stun points, 13 wound points and 7 mortal points.

Every piece of robot equipment, be it processors, actuators, propulsion systems or cabling, needs space. Chassis Points measure this free space inside a robot chassis that can be used to install a plethora of different systems. Needless to say, a larger robot will most certainly have a higher number of Chassis Points than a smaller one.

The formula to calculate Chassis Points is simple: $CP = h \times (30 - CON)$, where h is the size factor of the robot.

Each size category carries its size factor, as seen on the **Table 3.1 - Robot Sizes**. This size factor will be used to calculate several statistics and monetary prices that would not be possible to calculate otherwise.

Thus a 'tiny' robot with 5 CON would have: $1 \times (30 - 5) = 25$ Chassis Points, while a 'huge' robot with 15 CON would have: $30 \times (30 - 15) = 450$ Chassis Points. The constitution limits describe the ease at which closely packed systems in a smaller robot are more easily damaged than those spread out through a larger robot. You should choose an appropriate chassis size and decide on an appropriate constitution score for your robot, as explained in the previous two sections, before continuing any farther. See **Table 3.3 - Chassis Points per size and Constitution score** for details needed in defining specific system sizes.

If a system in the following chapters requires, for example, 16% Chassis Points (which is quite rare, they are generally rounded), always translate the percent using a minimum number of factors: 10%+5%+1% in this case. 8% would be calculated using 5%+1%+1%+1% values.

Furthermore, if an even percent number translates into an odd number of chassis points, stick with it. For example:

Let's take a medium-sized robot with 8 CON. It has these factors: 10%=11CP, 5%=6CP, 1%=1CP.

6 wheels on such a robot would take 30% space as each wheel requires 5% of total CP. This would translate to 33CP (10%+10%+10%, minimum number of factors), not 30CP (5%+5%+5%+5%+5%+5% CP). It may sound weird that 6 wheels take 33 Chassis Points, but it really is not an issue - 6 limbs required to hold those wheels will also take up 33 CP and will provide 33CP, and will cancel each other out, as described in the **Chapter 4.8 - Limbs**.

Once the proper amount of Chassis Points is defined, you can begin selecting the robot's systems. Note that after

Table 3.1. Robot Sizes

Size	Actual size	PL	h	CON	MOV	DEXmod	STRmod	Other
Diminutive	under 10cm	7	0.4	3-6	-6	+3	-2	-3 step Stealth skill bonus
Tiny	10cm-50cm	6	1	4-8	-4	+2	-1	-2 step Stealth skill bonus
Small	50cm-1m	5	3	5-10	-2	+1		-1 step Stealth skill bonus
Medium	1m-2m	5	5	6-12				
Large	2m-3m	5	10	7-14	+2	-1		+1 step Stealth skill penalty
Huge	over 3m	5	30	8-16	+4	-2	+1	+2 step Stealth skill penalty

PL: Progress Level at which is available.

h: Size factor, useful in a number of calculations.

CON: Constitution ability ranges.

MOV: Strength + Dexterity combined modifier for purposes of calculating movement (Table P8, PHB).

DEXmod: Dexterity resistance bonus or penalty due to size.

STRmod: Strength resistance bonus or penalty due to size.

Table 3.2. Robot Size Consequences

Size	MaxSTR	MaxDEX	Approximate weight	Roll
Diminutive	8	18	0.5-5	d12 x h
Tiny	10	17	5-25	2d12 x h
Small	12	16	20-100	3d12 x h
Medium	14	14	40-200	4d12 x h
Large	16	13	130-500	5d12 x h
Huge	18	12	400-10000	

MaxSTR: Maximum Strength allowed for a chassis size category.

MaxDEX: Maximum Dexterity allowed for a chassis size category.

Approximate weight: Approximate weight in kilograms for a chassis size category.

Roll: A general generation method for robot weight.

Table 3.3. Chassis Points per size and Constitution score

CON	0.4 (diminutive)				Height factor				3 (small)							
	CP	10%	5%	1%	1 (tiny)				CP	10%	5%	1%				
3	11	1	1	0												
4	10	1	1	0	26	3	1	0								
5	10	1	1	0	25	2	1	0	75	8	4	1				
6	10	1	1	0	24	2	1	0	72	7	4	1				
7					23	2	1	0	69	7	3	1				
8					22	2	1	0	66	7	3	1				
9									63	6	3	1				
10									60	6	3	1				
CON	5 (medium)				Height factor				10 (large)				30 (huge)			
	CP	10%	5%	1%	CP	10%	5%	1%	CP	10%	5%	1%	CP	10%	5%	1%
6	120	12	6	1												
7	115	12	6	1	230	23	12	2								
8	110	11	6	1	220	22	11	2	660	66	33	7				
9	105	11	5	1	210	21	11	2	630	63	32	6				
10	100	10	5	1	200	20	10	2	600	60	30	6				
11	95	10	5	1	190	19	10	2	570	57	29	6				
12	90	9	5	1	180	18	9	2	540	54	27	5				
13					170	17	9	2	510	51	26	5				
14					160	16	8	2	480	48	24	5				
15									450	45	23	5				
16									420	42	21	4				

buying mandatory and additional function-specific systems for your robot, it's OK to have Chassis Points left unused. The rest can be filled later, throughout the game, or converted into storage space at a small fee.

4. SYSTEMS

There are several systems without which the robot either couldn't work, or wouldn't fall under the robot category. For example, a machine without actuators or other propulsion doesn't move very much and could simply be considered a computer. Similarly, a robot without a processor, while it may move, is nothing more than a remote-controlled piece of machinery, given direction from near or afar. While such a machine is a robot by definition, in *Alternity* we call robots those machines that have adaptive intelligence, capability of movement and ability to perform both physical and mental tasks. Be sure to select all mandatory systems: chassis, power supply, actuators and/or propulsion, processor, cabling, sensors and data ports. Other systems are optional though highly suggested. Systems you select in this chapter will have direct consequences on many (and possibly all) of robot's statistics.

In order to properly select systems you should have a monetary limit that cannot be crossed during character creation. This limit depends also on the tone of your setting. These values are suggested for your typical robot hero:

Table 4.1. Hero monetary restrictions

PL		Hero Quality		
		Realistic	Heroic	MechaGodzilla
PL 5		100K	150K	200K
PL 6		150K	250K	350K
PL 7		250K	350K	450K
PL 8		350K	500K	650K

Realistic is appropriate for any reasonable campaign. It provides robot heroes a good range of possible starting equipment, but also an opportunity to advance throughout the game with funds they manage to amass while role-playing. MechaGodzilla gives the robot hero the opportunity to buy everything there is right from the start, which is unreasonable but fun. Heroic provides a good amount of upgrades and is easily usable for starting high-level robot heroes. PL9 heroes fall under the space-fantasy category; they shouldn't have a monetary cap, only a conceptual one.

4.1. Chassis

With the question of starting chassis size and its durability already answered, we can focus on the material it's created of. We will use again the size factor *h* here. The weight value is for reference only; it affects the robot brawling damage (**Chapter 5.6 - Other; Brawling**) and nothing else, since the general weight of the robot has already been calculated in **Table 3.2 - Robot Size Consequences**.

Table 4.2. Chassis materials

Type	PL	w/kg	Extra	Cost
Base Metal	5	20h	-	\$20*h
Metallic Alloy	5	10h	2%	\$50*h
Crystalline Alloy	6	5h	4%	\$200*h
Cerametal Alloy	6	3h	6%	\$500*h
Carbon Nano-Tube	6	2h	8%	\$2K*h
Mono-Filament	7	1h	10%	\$5K*h
Nano-Material	8	-	12%	\$10K*h
Gravitic Field	8	-	15%	\$25K*h
Bone	8	2h	-	\$500*h

PL: Progress level at which is available.
w/kg: Weight in kilograms.
Extra: Extra Chassis Points available.
Cost: Cost of the chassis.

The main difference will be weight and cost, and it will not affect any other statistics. The reduction in weight and volume of the chassis material does however provide more space for other systems at a certain monetary expense. Treat this extra chassis space as "free" space which doesn't apply in percentile calculations when determining sizes of actuators and other equipment.

Thus a 4m robot's chassis made of carbon nano-tube material weights only 60kg, but would be quite costly, about \$60K. The same chassis made of base metals would weight 600kg but would cost ten times less - \$6K. A medium size robot's chassis made of mono-filament would weight only 5kg and cost \$25K.

Base Metal (PL 5)

The basic infrastructure is made of metal such as iron, or its simple alloys like steel. The cost of such a chassis is minor but its weight may create great problems. Usually used for very large robots that do not need to be light.

Metallic Alloy (PL 5)

A refined alloy made of aluminum or other light-weight metals can have the same basic properties as basic metal but at a reduced weight. The cost to process it is somewhat higher.

Crystalline Alloy (PL 6)

Structures made of very strong crystal are grown and shaped, not built. Structures like artificial diamond can withstand pressures many times higher a normal metal alloy can.

Cerametal Alloy (PL 6)

A further refinement of metals by infusing them into ceramic greatly improves stress limits the material can withstand. Cerametal remains a standard for any lightweight construction throughout the ages.

Carbon Nano-Tube (PL 6)

An improvement over basic crystalline alloy by shaping the diamond-like structures into nano-sized tubes, a material is created that can allow technologies like a space elevator to become possible. It is incredibly strong for its size, but due to a very slow growth process also very expensive.

Mono-Filament (PL 7)

A casing made of one-molecule thick material. The weight of such a chassis is usually negligible, and the stress it can withstand is even higher than the carbon nano-tube material.

Nano-Material (PL 8)

Not a solid casing, the chassis is created of nano-robotic structures that can modify their internal position according to their programming, and possibly even repair internal damage.

Gravitic field (PL 8)

By fine-tuning gravitic forces, with use of gravity redirection engines, gravitic fields are created. This eliminates the need for a physical chassis. The advantages of such a system is that in case of a rupture the field would close itself automatically, and a robot can have control over who can access its internal systems by lowering and raising certain parts of the field. Also, access and maintenance of any internal system can be performed without problems regular casings cause. A major drawback is that in case of a complete power failure the internal systems loose support and the robot will fall apart. For security purposes, treat this chassis sealed and unbreakable by regular methods. Bullets or energy beams may puncture it but it always seals instantaneously.

Bone (PL 8)

This is an actual biological or synthetic bone skeleton, which is grown or created to be used with biological and synthetic tissue actuators. It cannot support any other type of actuators. It does not necessarily have to conform to humanoid shape, though if in humanoid shape, this casing also provides (for free) 4 limbs - 2 arms and 2 legs. Both arms have hand manipulators. Both legs have feet propulsion system. Additionally, neither the hand manipulators nor the feet propulsion system require any power - they are biological or synthetic tissue hands and feet, not robotic systems made of metal. See **Chapter 4.8 - Limbs**, and **Chapter 7.3 - Special Builds**.

4.2. Power Supply

No robot is fully autonomous without an independent power supply of some sort. Most mission-critical robots have redundancies in the form of a secondary (or even tertiary), backup power supply component. Systems need power to run, and if it's not available then it must be routed from another source. All passive power components (i.e. batteries - those that don't produce their own power but need to be recharged) come with a power socket for free. A robot with a single generator would have to purchase the power socket (and its additional wiring), in order to be plugged in, in case its generator shuts down. The power supply for a robot is measured in Power Points. Every piece of equipment that has a power requirement noted will need power to operate.

Note: These Power Points are compatible with the *Warships* system at 20:1 ratio. If a robot's generator produces 45 Power Points, then this is equal to 2 *Warships* Power Points, and can be used as such for a short time. Due to much greater fluctuations of a spaceship's power requirements and the design differences, the robot's power plant may easily burn out after only a few minutes of operation, depending on the technician's skill at integrating such - by default incompatible - systems.

Photocell (PL 5)

The photocell converts light and heat from a nearby light source into usable power. The concept has been used from the beginning of the Information Age, and the drawbacks are that the amount of power received is very small compared to other power sources, and it requires light to function. The benefits are sometimes useful - the photocell system requires no fuel whatsoever except light. The robot that remains in direct Earth-grade sunlight for at least 12 hours a day will manage to store enough power to keep it running during the night. This system is often used for

space exploration robots, and is one of the rare solutions that, if kept in good shape, allows the robot to remain powered indefinitely. See the **Chapter 4.11 - Casing** for further information on other special properties of this system.

Rechargeable Battery (PL 5)

From the earliest days of battery consumption it was clear that constant changing of batteries is less cost-efficient than using rechargeable ones. The rechargeable battery system is easily charged by plugging the robot into a power generator or another battery system. The batteries need to be recharged every 24 hours, and the recharge process takes 1 hour due to inefficient chemical-to-energy power conversion.

Fuel Cell (PL 5)

An improvement on the rechargeable battery system, the fuel cell converts fluids with high energy density (like methanol) into electrical energy. While the amount of electricity received is higher than from the normal chemical cell (battery), the process is inefficient and has to be recharged often. The fuel cell storage needs to be recharged every 24 hours and the process usually takes a few minutes. However, energy dense liquids may be hard to find, and are costly. The fuel cell system does not come with a standard power socket but with a tube for direct injection of fuel. One full charge of the fuel cell costs \$10 per one Chassis Point of installation.

Lanthanide Capacitors (PL 6)

Capacitors have been used since early PL5, but it took the discovery of lanthanide to enable creation of long-lasting capacitors. These lanthanide capacitors have in time replaced battery systems and are a general improvement in both the longevity and recharge speed over regular batteries. Lanthanide capacitors can power a robot up to 48 hours and the recharge time lasts only a minute, since there is no conversion to chemical energy like the batteries had.

Spacewave Receptor (PL 6)

The spacewave receptor receives projected energy from a central point. The spacewave transmitter packs electrical energy and sends it via high-bandwidth wave bursts through space/air to the robot. While this keeps the robot's operational radius relatively small (depending on the quality of the transmitter), many utility robots use this system to save chassis space and because of the relative cheapness of the system. The power socket received with this system is a specially modified antenna, not a regular socket.

Fusion Generator (PL 6)

Fusion generators harness the power of nuclear fusion to create usable energy. Even with the miniaturization these installations are rather big and are reserved for large robots. They usually come with fail-safes, though on military robots these generators can be made to self-destruct (See **Chapter 4.15 - Miscellaneous; Self-Destruct mechanism**), creating a limited but very destructive blast. The fusion generator can be replenished easily if the robot has access to water, from which hydrogen is extracted. The repository of water inside the generator will last for a week before it needs to be recharged.

Grav-Fusion Generator (PL 7)

Based on Fraal technology, artificial gravity is used instead of magnets to contain the fusion reaction. The result is a

Table 4.3. Power Supply systems

Power Source	PL	Pow	Cost	C/CP	MinCP	Refill	Sock	Destructive
Photocells	5	1	\$5K	\$500	10%	No	-	No
Rechargeable Battery	5	2	\$200	\$100	1	Yes	Yes	No
Fuel Cell	5	3	\$500	\$200	2	Yes	Diff.	No
Lathanide Capacitors	6	3	\$2K	\$500	4	Yes	Yes	No
Spacewave Receptor	6	4	\$1K	\$500	1	No	Diff.	No
Fusion Generator	6	4	\$5K	\$1K	6	Yes	-	Yes
Grav-Fusion Generator	7	5	\$8K	\$1K	6	Yes	-	No
Antimatter Reactor	7	6	\$25K	\$3K	10	Yes	-	Yes
Mass Reactor	7	7	\$15K	\$2K	4	Yes	-	Yes
Micro-Fusion Cells	8	8	\$10K	\$1K	2	Yes	Yes	No
Dynamic Mass Reactor	8	8	\$30K	\$2K	3	Yes	-	Yes
Matter Converter	8	9	\$40K	\$3K	8	Yes	-	No
Micro-Quantum Cell	9	10	\$50K	\$4K	3	No	-	No
Mini-Singularity Generator	9	12	\$100K	\$5K	20	Yes	-	Yes

PL: Progress Level at which is available.
 Pow: Power Points produced per one Chassis Point of installation.
 Cost: Base cost of the installation.
 C/CP: Additional cost per each Chassis Point of installation, separate from base installation cost.
 MinCP: Minimal size of the installation in Chassis Points.
 Refill: Does the power supply need to be refilled or not?
 Sock: A free power socket comes with the system; Diff. means it's free but not standard.
 Destructive: Some power plants may explode if damaged or rigged to do so.

generator that needs less space and is more efficient. A notable side-effect is that the grav-fusion generator cannot be made to detonate; it just shuts down if damaged. The refueling is done on the same basis as the regular fusion generator - every week the robot needs access to a small amount of water.

Antimatter Reactor (PL 7)

The antimatter reactor combines a particle of matter with a particle of antimatter. The reaction destroys both particles but generates vast amounts of energy. Like the fusion generator, strong magnetic forces are required to contain the reaction and strong fail-safes are (usually) placed to prevent an uncontrolled reaction. The antimatter must be replaced every 3-5 years and is very expensive - the recharge costs half the cost of the original reactor installation, which itself is a very expensive system.

Mass Reactor (PL 7)

The mass reactor functions under the assumption that dark matter exists, and that during its decay process it releases energy while converting it to "normal" matter. The mass reactor harnesses this energy and converts it into a usable form. It requires refueling once every six months at a cost of \$500 per Chassis Point of the installation. An accidental or deliberate uncontrolled reaction can be as devastating as a miniature fusion one.

Micro-Fusion Cells (PL 8)

Miniaturization of the grav-fusion generator leads to production of micro-fusion cells that operate on a very similar principle as a rechargeable battery system. The micro-fusion cells are small battery-like packs that each contains a miniature version of the grav-fusion generator. The installation can keep the robot running for a month, and can be recharged by a combination of energy and hydrogen/water. The recharge time is about one hour.

Dynamic Mass Reactor (PL 8)

Through miniaturization the mass reactor has been reduced and its effectiveness increased. The result is a smaller system which provides more power and is safer to handle. However due to increased consumption rate, the dark matter still has to be replaced every six months at a cost of \$500 per Chassis Point of installation.

Matter Converter (PL 8)

The matter converter literally does just what it says: matter conversion. It can convert anything into energy and generate enormous amounts of power. Its fuel can be anything and the cheapness of anything offsets the cost of the installation itself. This installation, though costly, is often installed on long-lasting mission robots that can refuel even on space dust if traveling between systems.

Micro-Quantum Cell (PL 9)

Acting as a quasi-Perpetuum Mobile, the quantum cell harnesses the quantum fluctuations of the vacuum itself and produces energy from no fuel at all. While incredibly expensive, the power plant is a basically the first power source after photocells that requires no refueling and is able to produce power indefinitely.

Mini-Singularity Generator (PL 9)

The generator rarely used outside the largest robots, it contains a quantum singularity - a black hole, and taps into its power. A black hole contains more energy per volume than anything else known in the universe and thus this system is unmatched. Similarly unmatched are the dangers of this system's usage, in case of damage the released black hole can create quite a mess. Harnessing this energy drains the black hole and it has to be replaced every 10-15 years, at a very high cost too: half the price of the original installation. That is one more reason for this power plant to be used only where nothing else will suffice.

Table 4.4. Other Power systems

Type	PL	CP	Cost
Power Socket	5	1	\$100
Fast-Switch	6	1	\$500
Dual Controller	6	2	\$1K
Multiple Controller	6	4	\$3K

PL: Progress Level at which is available.
 CP: Chassis Points required.
 Cost: Cost per installation.

Other Power Systems

Power Socket (PL 5)

A standard power socket for plugging a robot into an external power supply. Quite common for robots with rechargeable power supplies, eliminating the need to extract the batteries in order to have them recharged. Robots without rechargeable systems can still have a power socket that would allow them to function, although in a very limited radius, if they begin having power plant problems. The power socket can be used in reverse as well - allowing a robot with a generator to power something else.

Fast-Switch (PL 6)

Quite common in robots with several independent power sources, it monitors the power levels and can perform a switch from one to another in less than a nanosecond. Otherwise the switch may take much longer and in some cases it needs to be performed by a technician. Without this system a robot would need up to a minute to initialize and switch all of its systems to the alternate power source, while at the same time stopping cold in its tracks to preserve what power is left in the capacitors.

Dual Controller (PL 6)

A system that regulates power exchanges in robots with dual power solutions, it allows a robot to recharge the batteries from its own power generator, and allows the use of two power sources at the same time by carefully distributing loads between them. Rather small but extra cabling does take some additional space. This supersedes a fast-switch.

Multiple Controller (PL 6)

An enhanced version of the dual controller, this can handle three or more independent power sources. Extra cabling reflects its size. This also supersedes a fast-switch.

4.3. Processors

Marvin: 'Reverse primary thrust, Marvin,' that's what they say to me, 'open airlock number three, Marvin. Marvin, can you pick up that piece of paper?' Can I pick up that piece of paper! Here I am, brain the size of a planet and they ask me to take you down to the bridge. Call that job satisfaction? 'Cos I don't.

Processors are the brains of the robot, processing the sensory data, correlating it to robot's programming, and determining the robot's actions. The better the processor the faster will be the robot's reactions due to the increased speed of processing the input data. It is possible to have a dual or multi-processor system, but these statistics below won't change. A robot with two ordinary PL6 processors will

still have a maximum intelligence of 9, with other relevant statistics. In case of damage to the primary processor, if the backup one is of lower quality the maximum statistics will fall to those values. So the same example robot with a backup marginal PL6 processor would fall to the maximum intelligence score of 8 and would run with a reduced memory capacity. All of its intelligence-based (and quite possibly will and personality) skill scores could be affected by this change as well.

The minimum intelligence is always 1, as there is always a need for automatons at every Progress Level. However, such a robot could not be a hero, more along the lines of a mobile microwave oven or trash compactor.

Robot skills are programs. How much of these programs the robot can run at the same time is based on the quality of its processor. Every robot needs to have a background Operating System, which fills one memory slot. The OS governs all the primary functions like walking, communication, memory access, navigation, power distribution, object and voice identification and decision making. The OS uses the long-term memory to search for solutions to problems and to store new experiences. This method, combined with learning algorithms, forms the robot's intelligence. Intelligence is not the same thing as consciousness; it is just programmed behavior and a method of updating this behavior through time via optimization of its subroutines.

A robot's skills require memory space to run. Every broad skill is considered to be one memory slot big, and every specialty skill requires as much memory slots as it has ranks. Thus a robot with an amazing PL5 processor could have a skill at rank 5 loaded into memory - one slot for the OS, one for the broad skill and 5 for the specialty skill.

It is possible to load only a part of a specialty skill into memory in order to make space for perhaps another partially-loaded specialty skill. A robot with 8 ranks in two skills but only 10 available active slots for specialty skills (after the OS and the appropriate broad skill were loaded into memory) could load 5 ranks from each skill, assuming the specialty skills were both from the same broad skill. If one of the specialty skills were from a different broad skill than the first, another slot of memory would have to be used, leaving only 9 active memory slots to be divided among the desired specialty skills.

Other software also takes up memory space. Programs used for Grid-related actions can also be bought and executed by the robot, provided the robot has enough memory slots to perform all the necessary tasks at once. For example, in an extreme case of boredom a mine-sweeping robot could buy a piece of entertainment software and play Minesweeper in its mind. Such an action would need one memory slot since an entertainment program of this complexity would not be large.

Positronic Brain (PL 9)

A direct resemblance of a humanoid brain, the positronic brain uses subatomic particles called positrons to carry information much like a normal brain would use electrons to travel the neurons. As a result it is possible for an AI to develop psionic abilities. This brain allows direct integration of an AI without any additional equipment, as well as transfers of human consciousness into it so that people may extend their lives inside robotic bodies.

Quantum Processor (PL 9)

The quantum processor is the final word in processor miniaturization; it uses quantum fluctuations in atoms to perform incredibly fast calculations. The quantum processor has no limit on maximum active memory slots, but it still needs a dedicated AI board to support an AI.



Marvin, *The Hitchhiker's Guide to the Galaxy*, 1981. Marvin the paranoid android is a classic example of under-utilized mental capacities, mainly due to his appalling behavioural coding.

Other processors

Grid Coprocessor (PL 6)

An auxiliary Grid virtualization processor that handles most of the Grid-related functions, allowing the main processor

to focus on the tasks it has set. It allows a much faster reaction time while connected to the Grid, providing a -2 step bonus to action check modifier for Grid-related actions. While enabled, it requires one memory slot in the main processor in order to communicate with it and for the tasks to be delegated.

Table 4.6. Other Processor Systems

Type	CP	PP	Cost
<i>PL6</i>			
Grid Coprocessor	1	1	\$5K
Boost Chipset			
Ordinary	1	1	\$2K
Good	1	2	\$4K
Amazing	2	3	\$7K
<i>PL7</i>			
Targeting Coprocessor			
Ordinary	1	1	\$5K
Good	2	3	\$10K
Amazing	4	5	\$15K
Accelerator Chipset			
Ordinary	1	2	\$8K
Good	2	5	\$15K
Amazing	3	10	\$25K
<i>PL8</i>			
AI board	2	3	\$30K

PL: Progress level at which is available.
 CP: Chassis Points required for installation.
 PP: Power Points required to operate.
 Cost: Cost of the installation.

Table 4.5. Processors and Relevant Info

Quality	Mact	Mrnk	Mint	Mwil	Mper	CP	PP	MA/R	ACmod	Cost
<i>PL5</i>										
Marginal	2	-	6	3	1	1	1	1	+d12	\$100
Ordinary	3	1	7	4	2	2	3	2	+d8	\$200
Good	5	3	8	5	3	3	6	3	+d6	\$300
Amazing	7	5	9	6	4	5	8	3	+d4	\$500
<i>PL6</i>										
Marginal	3	1	8	5	3	1	1	3	+d8	\$400
Ordinary	5	3	9	6	4	2	2	3	+d6	\$1K
Good	7	5	10	7	5	3	4	4	+d4	\$2K
Amazing	9	7	11	8	6	4	5	4	+d0	\$3K
<i>PL7</i>										
Marginal	4	2	12	7	5	1	1	3	+d6	\$2K
Ordinary	7	5	13	8	6	1	1	3	+d4	\$3K
Good	10	8	14	9	7	2	2	4	+d0	\$5K
Amazing	13	11	15	10	8	3	3	4	-d4	\$10K
<i>PL8</i>										
Marginal	7	5	12	10	8	1	1	3	+d4	\$2K
Ordinary	10	8	14	11	9	1	1	3	+d0	\$5K
Good	15	12	15	12	10	1	2	4	-d4	\$15K
Amazing	18	12	16	13	11	2	3	4	-d6	\$25K
<i>PL9</i>										
Positronic	N/A	12	20	16	14	2	5	4	-d8	\$40K
Quantum	N/A	12	22	17	15	3	5	4	-d12	\$100K

Mact: Maximum active memory slots.
 Mrnk: Maximum usable ranks in a skill.
 Mint: Maximum supported Intelligence.
 Mwil: Maximum supported Will.
 Mper: Maximum supported Personality.
 CP: Chassis Points needed for the installation.
 PP: Power Points required to operate.
 MA/R: Maximum actions per round.
 ACmod: Action check modifier provided.
 Cost: Cost of the installation.

Boost Chipset (PL 6)

Much like the Grid coprocessor while online, the boost chipset quickens the reaction time in the real world. However, it is a very difficult piece of hardware to use effectively, and carries some inherent risks. The boost chipset is theoretically capable of adding a -1, -2 or -3 action check modifier bonus to the robot, depending on the quality of the chipset installed, and the level of success achieved on its roll to boost the available energy. See **Chapter 4.5 - Cabling** for a detailed explanation of this subject.

In order for it to function at all, the robot must have cabling that allows energy boosts. The robot must then attempt to perform the extra energy draw from its power supply to power the chipset. If the robot succeeds, the bonus from the boost chipset is dependent on the level of success achieved with the 'energy boost' roll. For example, if a robot has an Amazing-quality boost chipset, but manages only a Good success on his energy boost attempt, the chipset will provide it only a -2 modifier bonus.

Then, there is a third requirement - memory space. The robot needs to dedicate as many memory slots as was the bonus received, for its processor to communicate with the boost chipset and to delegate some of its motor control functions to it. This leaves less work for the processor so it can act more quickly - and this is where the actual speedup happens. So an Amazing-quality boost chipset that managed to provide a -3 action check modifier would require 3 memory slots.

Part of the extra power that was extracted from the power supply goes into the boost chipset (it only requires power when activated), while the rest is freely usable for other equipment. A boost chipset that did not provide maximum boost still consumes the same amount of power, as per its description. The boost chipset remains in operation for as long as the robot manages to maintain the extra power flowing in. Once shut down, however, it needs a cool down time which depends on the quality of the chipset - 1 hour for Ordinary, 2 hours for Good and 3 hours for Amazing-quality boost chipset.

Targeting Coprocessor (PL 7)

This processor is designed to help a robot target a single integrated ranged weapon. It calculates atmospheric interferences like wind and rain, robot's and target's relative movement speeds, exact ballistic trajectory of the weapon and all other factors that may stand in between. The bonus received ranges from -1 to -3 step bonus for the integrated weapon the system is connected to, depending on the coprocessor's quality. An Ordinary-grade coprocessor needs one active memory slot to function, a Good-grade coprocessor needs 2 active memory slots, and the Amazing-grade targeting coprocessor needs 3 active memory slots. Additional requirement for this system is that the robot has a Hi-res video sensor installed. Targeting coprocessors are very expensive but still often installed in high-grade military robots.

Accelerator Chipset (PL 7)

The accelerator chipset features a set of coprocessors that use aggressive speed-optimization routines to boost the robot's speed past its usual limits for short amounts of time. As its boost chipset predecessor, it has some difficult requirements and is even more dangerous. The chipset can theoretically provide these bonuses to the robot:

Quality	Action check inc.	Actions/round inc.
Ordinary	+2	-
Good	+3	+1
Amazing	+4	+2

A robot needs to perform an energy boost attempt, as described in **Chapter 4.5 - Cabling**. If successful, the bonus of the accelerator chipset depends on how good the success result was - if the robot has an Amazing-quality accelerator chipset but performed only a Good success on its power boost attempt, it will receive the bonus equal to what a Good-quality chipset could give it: +3 action check score increase and +1 action per round speed boost. In addition, the chipset uses a similar link to the main processor as the boost chipset; an Ordinary-grade boost requires one memory slot, a Good-grade boost needs 2 memory slots and an Amazing-grade boost needs 3 memory slots to function.

The system operates for as long as the robot can perform energy boosts. Once shut down it needs 2 hours per system quality grade to cool down - 2 hours for an Ordinary-quality accelerator chipset up to 6 hours for Amazing-quality accelerator chipset.

The downsides of this system are massive. The overheating of the robot's processor and actuators would cause overloads, if not regulated. Regulation means "shutting down all that can be shut down until it cools off". The robot needs to perform a Stamina-*endurance* check once the accelerator chipset is switched off in order to continue to function with lower power levels. A failure means the robot had to shut down completely until the 'cool down' time has passed. A critical failure means the robot failed to shut down and its processor, accelerator chipset, cabling and actuators melted down.

Cool down: Until the Accelerator chipset and all other robot parts 'cool down' (2 to 6 hours), power supply to the processor and actuators is capped at 50% and all the robot's attribute scores and maximum active memory slots are literally halved. If a robot previously had a strength score of 13, it is now "regulated" to 6. If the robot has a processor that provided 10 active memory slots, due to power shortage it can only access 5 of them. Do not forget to "regulate" other attributes - dexterity, will and personality. Constitution is the only attribute that is not affected.

An accelerator chipset provides a different approach to speed boosting than boost chipset, and can work in parallel with it. The accelerator chipset is never installed in a brand-name robot as no guarantee could ever cover it.

AI Board (PL 8)

Artificial Intelligence requires very special hardware. Regular robot processors cannot support AIs without a special crystal lattice board. When an AI is loaded it fills up all the memory slots the processor had but the AI can access all of the skills and other programs that are in robot's storage memory. This has a side-effect that use of boost chipsets and other hardware that requires extra memory space is no longer supported. It's maybe for the best, since no sane AI would want to risk destruction by a power surge in a defective cable. Other programs can still be used without any restrictions on memory space, but any hardware system that specifically states that it requires a memory slot in order to function can no longer be used. See **Chapter 7.2 - AI Specifics**.

4.4. Actuators

Actuators are systems that provide movement for a robot - they serve as muscles. Without them the robot would lack physical strength and dexterity, even though it is possible for a robot to carry only a propulsion unit. Space-exploration robots for example do not need actuators since they do not have arms or legs. Virtually every other robot needs this system. Actuators are a system that's directly responsible for the robot's strength and dexterity ranges.

Diminutive robots do not always require actuators. It is possible for a diminutive robot with a gravitic propulsion unit to have a single tool that has a fixed position. Then such a robot would not move the tool - rather it would move itself, much like a flying screwdriver. See **Chapter 5.2 - Attributes** for more information on such cases.

Electromotor (PL 5)

The most basic principle of robot limb movement, the electromotor based actuators are relatively weak and slow, but very simple and cheap to produce. A limb is directly attached to the electromotor axis and the electromotor rotation produces movement.

Servo (PL 5)

An upgrade on the basic electromotor system. Each limb is connected to a wire that serves as a tendon. A pair of electromotors pulls the wire each way to produce basic movements. This system produces marginally faster results and is somewhat stronger than the basic electromotor system. Also, loss of a single electromotor will not result in the loss of mobility, only its degradation.

Pneumatic (PL 5)

Pneumatic systems use variable air force to provide motor functions. Due to easiness of pumping large amounts of air into a limb the reaction time is quicker, but the air cannot retain the same pressure for long periods of time - the resulting strength of such a system is rather poor. Also, operation in vacuum will be impossible and quite damaging to the actuators due to different air behavior at low temperatures.

Hydraulic (PL 5)

Much like pneumatic systems, the hydraulic actuators use liquid pressure to regulate limb movement. Such a system can deploy massive power but liquid pumping is a slow process and the reaction time will suffer greatly. Operation in cold environments and vacuum is impossible and highly destructive to the actuators due to liquid freezing problems.

Muscle Wire (PL 6)

Muscle wire coils are made of special memory-retaining materials that deform in a predefined way according to the amount of electricity that passes through them. The electricity will cause different temperatures in the muscle wire bundles and this is the mechanism behind this system. Extreme hot and cold environments including vacuum will provide significant problems with limb reaction time, effectively halving the robot's dexterity score.

Aleeran (PL 6)

Much like muscle wire system, the Aleeran actuators use memory-retaining material though not in form of wire coils but sheets of metal that are applied over the skeleton or chassis. The resulting approach consumes significantly more energy but provides more reliable results than muscle wire systems. Extreme hot and cold environments no longer cause problems but vacuum cold does, effectively halving robot's dexterity score.

T'sa Electromotor (PL 6)

An upgrade over the original electromotor system, the T'sa electromotors are in constant rotation but only connect their axis to the limb when needed, an action that is much faster than spinning up electromotors from stationary position. This approach, together with massive power of these electromotors greatly increases both strength and reaction time.

Micro-Ligament (PL 7)

A further upgrade over the existing Aleeran system, micro-ligaments are miniature straps of memory-retaining material that are placed around joints. Each strap receives an

Table 4.7. Actuators and Relevant Info

Type	PL	STR	DEX	Cost/CP	CP	PP/CP	Vacuum
Electromotor	5	3-7	4-9	\$20	5%	1	Yes
Servo	5	4-10	6-10	\$50	10%	1	Yes
Pneumatic	5	2-8	6-12	\$300	15%	1	No
Hydraulic	5	12-18	2-7	\$500	20%	1.5	No
Muscle Wire	6	2-6	8-12	\$100	5%	1.5	Difficult
Aleeran	6	8-14	4-9	\$1K	10%	2	Difficult
T'sa Electromotor	6	6-12	8-12	\$700	15%	1.5	Yes
Micro-Ligament	7	4-10	8-14	\$2K	5%	2	Yes
Grav-Musculature	7	4-10	6-16	\$3K	15%	2.5	Yes
Mass Compressors	7	10-18	4-10	\$4K	20%	3.5	Yes
Biological	8	4-14	4-14	\$300	75%	-	No
Synthetic Tissue	8	4-16	4-16	\$1K	55%	0.5	No
Nano-Fluids	8	12-18	10-18	\$15K	15%	5	Yes

PL: Progress Level at which is available.

STR: Strength score range provided.

DEX: Dexterity score range provided.

Cost/CP: Cost per one Chassis Point of installation.

CP: Chassis Points needed for installation.

PP/CP: Power Points required to operate, per one Chassis Point of installation.

independent power supply and the combining force of millions of these micro-ligament straps creates an improvement in speed over the Aleeran system. Unfortunately due to the law of the lever, the maximum force this system can produce is lessened compared to Aleeran actuators. Fortunately, due to the very small size of the straps, temperature has no effect on the system.

Grav-Musculature (PL 7)

Using directional gravity inducing micro-engines throughout the limbs, each limb moves towards the largest gravity field. As the directional gravity engines produce rays instead of waves of gravity (that is, waves that spike in one direction and produce ignorable results in others), such a mechanism doesn't affect anything except what it was designed to affect - limbs. Reaction time is phenomenal, but unfortunately long exposure to super-high gravity would shatter the limbs, so alike the pneumatic system the resulting strenght is lessened.

Mass Compressors (PL 7)

A variation of the grav-musculature system, the mass compressors use directed gravitational force to move limbs, but with a major difference. Limbs are encased in super heavy materials and can withstand the enormous forces that cause compression of their mass itself. Maximum force the system can produce is unmatched, but as a result of all this extra weight the speed of such a system is less than optimal. Gravitational induction engines require great amounts of energy to operate.

Biological (PL 8)

True flesh that is used mostly in cybrid or cyborg systems, often cloned from existing living tissue for the purpose of AI implantation. While inferior to other more advanced systems, quite popular among AIs that desire to become human in appearance for whatever reasons. As all living tissue, it's very vulnerable to temperature, pressure, radiation and a plethora of other problems including diseases. Energy requirements of this system are the same as those of a normal person - nonexistent. Use of these actuators has these prerequisites and cautionaries:

- These "actuators" (muscles) can be grafted only over bone chassis.
- If chassis is non-humanoid shaped form, that case is beyond the **Foundry's** scope. Values above are usable only for humanoid androids. See **Chapter 7.3 - Special Builds**.
- These actuators require skin "casing"; it's impossible to install real armor onto them.
- These actuators require nerves as "cabling". They do not

possess any data-processing abilities.

- Robot using these actuators will suffer fatigue just like any other biological creature.

Synthetic Tissue (PL 8)

Undistinguishable from the true biological tissue to the naked eye, these actuators are greatly enhanced. Standard nerves can be replaced with optics, bones reinforced with lightweight alloys and muscles designed to be stronger and more efficient from the beginning. As with biological actuators, this system has prerequisites and cautionaries:

- These actuators can be crafted over any chassis form and size.
- If using non-humanoid form the values listed above need to be changed by GM. See **Chapter 7.3 - Special Builds**.
- These actuators require skin "casing" to be indistinguishable from biological actuators to the naked eye. They can, however, support any light-class casing.
- These actuators require either nerves or optic "cabling".
- Robot using these actuators will suffer fatigue just like any other creature.

Nano-Fluids (PL 8)

A final word in hydraulic systems, the basic principle is much the same. Nano-fluid inside the actuators is composed of billions of nanobots that exert their own force in combination to ultra-fast pumping action. The nano-fluid can change its own viscosity so its removal from the limb is appropriately faster than in the classic hydraulic system, as the fluid *wants* to remove itself. The force and reaction time of this system is yet unmatched, as well as its power requirements.

4.5. Cabling

Every piece of equipment requires cabling to transfer power and data. Robots are no different. The quality of the cabling inside a robot can have long term consequences, and often poor wiring causes overloads and crashes. This system, when combined with a robot's processor, defines maximum actions per round score and also may allow a robot to draw extra power from its power source in times of need. This extra power can be routed through existing data cabling, interposing over the data transfer. Such an attempt is called a Power Boost. Since data cables are not designed to carry high voltage such an attempt can be dangerous if performed with poor cabling.

Table 4.8. Cabling and Relevant Info

Type	PL	CP	Cost/CP	Mact.	Powermod
Serial	5	5%	\$10	1	+2
Parallel	5	10%	\$10	2	+1
Optic	5	5%	\$50	4	N/A
Extra Cabling	6	5%	\$70	-	-2
Ultra-Wide	6	10%	\$100	4	0
Wave-Based	6	5%	\$300	3	-1
Gravitic	7	5%	\$500	4	-1
Pulse	8	-	\$1500	4	-2
Nerves	8	-	-	3	N/A

PL: Progress Level at Which is available.

CP: Chassis points required for installation.

Cost/CP: Cost per one Chassis Point of installation.

Mact.: Maximum number of Actions per Round the system allows.

Powermod: Step penalty or bonus for Power Boost attempt.

Power Boost: A robot may attempt a System Operation-*engineering* check to draw more power from its power source for a brief period of time, usually one round or so. An Ordinary success would mean it managed to produce 10% more power than optimal, Good success indicates 20% more power and Amazing success allows the robot to access 30% more power. A critical failure will cause a burn-out as some piece of cabling caught fire. This deals d4 wound points of damage to the robot, and the robot must then succeed a Stamina-*endurance* skill check to isolate that part and put out the fire. If the robot fails the check it immediately shuts down and waits for repairs. A critical failure of the Stamina-*endurance* check locks the robot's attempt to isolate damaged parts and as a result the robot's power supply and cabling melt down.

Note: Diminutive robots do not require cabling as they have systems very close to each other and their cabling requirements are negligible. Diminutive robots can perform as many actions per round as their processor and actuators allow them to, and they cannot perform a power boost in an attempt to supply more power than usual, even with cabling installed - their systems are simply too small.

Serial (PL 5)

Serial data transfer is the crudest method available, where bits are transmitted one after another through a wire. This method is very slow, but good enough for most primitive PL5 robots since their processors cannot process data at a faster rate anyway.

Parallel (PL 5)

While parallel cables take much more space, they offer a faster bandwidth rate and consequently faster reaction time. Data travels in packets through many wires from a source to the target system. The amount of cabling makes it easier to transfer more energy as well, but since the data cables are not designed to carry pure electricity the feat is still not very easily accomplished.

Optic (PL 5)

Optic cabling requires about the same space as serial cabling, but offers transfer rates at the speed of light. Due to the cable structure power transfers are impossible - optic cables are not wires and cannot transfer electrical current.

Extra Cabling (PL 6)

More space than normal is dedicated to power cables, for the explicit purposes of transferring more power than the robot was designed for. While the same space may be used to install a larger power generator, such an upgrade is always more expensive than installing extra cables. These cables come with advanced systems for energy use optimization and can greatly help the robot when trying to draw that last drop of energy from its power source.

Ultra-Wide (PL 6)

Ultra-wide uses groups of optic cables to quickly transfer vast amounts of data from one system to another. These cabling groups require a lot of space but offer excellent transfer rate. Dedicated power cables placed among data cabling are designed to distribute energy from one source to another.

Wave-Based (PL 6)

By replacing actual cabling with transmitters and receivers for both data and power, a relative amount of space is saved and a safer method for energy transfers is accomplished. Robots use miniature spacewave transmitters and receptors to transfer the power. This system is reasonably cheap and effective for smaller robots.

Gravitic (PL 7)

Advancing the wave-based transmitters and receivers to much higher bandwidths, a robot can easily control its inner workings and can achieve excellent reaction time. Data is transferred over gravitic waves while the energy still transfers through wave-based systems.

Pulse (PL 8)

Pulse transfer system removes the need for transmitters and receivers on specific systems by integrating those into the systems themselves. Due to cleanliness of design and the ease of transferring energy through pulse spikes, the control of energy distribution in the Energy Age becomes easy for any robot. The installation doesn't require any space but does require the initial cost to be paid (same as buying 1 CP).

Nerves (PL 8)

Biological nerves are common "cabling" for a robot with biological or synthetic tissue actuators. In some cases they are replaced with optics if synthetic tissue actuators are used. Since nerves are living or pseudo-living cells and not cables, they cannot transfer any power.

4.6. Sensors

A human has five senses. Robots need at least one in order to sense the world around them. The maximum number of senses robots can have installed is restricted only by their available Chassis Points. How many of these a robot can control at a same time is another question entirely and is defined by its processor quality.

A Marginal processor can control only one sensor at a time. Ordinary can use two, Good processor can process three sensors and Amazing processor can use five sensors at once. Any robot can attempt to use more than this restriction but will suffer penalties to relevant checks - usually *Awareness-perception*. A cumulative +2 step penalty on relevant skill checks is applied for each sensor over its allowable allotment of 'senses'. Needless to mention, a robot needs to have enough power to keep all sensors operational when in use.

Note: A PL 9 processor can use all the sensors it has at the same time with no restrictions.

Chemical Sniffer (PL 5)

This device detects certain types of chemicals in the air - if the chemical can freely evaporate and obviously is not in a closed and airtight environment the chemical sniffer has a chance to detect it. A Chemical Sniffer can be calibrated to provide either a -1 step bonus on the robot's *Awareness-perception* score in order to detect a wide variety of chemicals or to provide -3 step bonus on a specific type of chemical like drugs or explosives.

Table 4.9. Sensor Systems

Type	Cost	CP	PP
<i>PL5</i>			
Chemical Sniffer	\$9K	5	1
GPS	\$2K	5	5
Radar	\$15K	10	10
IR Sensor	\$3K	3	1
Metal Detector	\$2K	5	2
Motion Sensor	\$4K	3	1
Pickup/voicebox	\$100	1	1
Video	\$200	1	1
<i>PL6</i>			
Hi-Res Video	\$2K	2	1
Bio-Detector	\$3K	2	1
EM Detector	\$5K	2	1
Radiation Detector	\$3K	2	1
LADAR	\$2K	2	2
Life Recorder	\$2K	1	1
Sonar	\$9K	5	4
Imaging Scanner	\$4K	1	1
Weapon Detector	\$2K	1	1
<i>PL7</i>			
Holo	\$2K	2	2
Brainprint Scanner	\$8K	5	7
Multiband Radar	\$10K	10	10
<i>PL8</i>			
Mass Radar	\$40K	20	20
Multiphase Radar	\$20K	15	15
Gravitic	\$20K	15	10
Biological Senses	\$50K	-	-
Synthetic Senses	\$80K	2	2

Cost: Cost of the system.

CP: Chassis Points required for installation.

PP: Power Points required to operate.

GPS (PL 5)

Global Positioning Sensors use broadcast signals from satellites or ships in orbit to provide a precise location of the robot. This system provides a -2 step bonus on Navigation-*surface navigation* skill checks but only if there are navigational satellites in place.

Radar (PL 5)

A basic system for detecting surroundings, radar can locate a medium sized or larger object or creature on a level field up to 2km away or up to 20km if the target is airborne. Radar will not penetrate any cover such as walls. It is an active sensor and can be detected from twice its usable range. It is operated by System Operation-*sensors* skill.

IR Sensor (PL 5)

Infrared sensors detect infrared (heat) emissions, allowing a robot to detect warm objects and creatures, or determine if they passed recently through a cold environment. The sensor is rather small and is usually integrated in the chassis. It provides a -1 bonus on Investigate skill checks to detect new tracks or recently held objects.

Metal Detector (PL 5)

A metal detector is usually a relatively large circular electromagnet that detects disturbances in magnetic fields when near metallic objects. Quite useful when searching for a needle in a hay stack or a dropped nickel, it can pinpoint anything as small as a bullet in a 2m radius.

Motion Sensor (PL 5)

Motion Sensors are short range detectors of disturbances like air compression, sound, or heat exchanges which would be caused by movement of some kind. Their operational radius is about 10 meters, and provides a -1 bonus to Awareness checks at detecting movement in their effective radius.

Pickup/voicebox (PL 5)

This is a basic microphone / speaker system that allows a robot to communicate by speech and to hear sounds.

Video (PL 5)

A camera is perhaps the most primary robot sensor, until holo imaging becomes available. The robot receives a 2D image and unless it has an Amazing processor that is capable of generating a 3D landscape from that image, the robot will receive a +1 penalty on all Ranged Weapon checks. The 3D imaging software is a common part of the OS at PL 6 and later but still requires an Amazing-grade processor.

Hi-Res Video (PL 6)

A powerful set of lenses that allow the robot to zoom in on a very distant object, providing a 30x zoom ratio with a digital 200x zoom on top of it. However, if using the digital zoom, the system requires one memory slot to process and enhance the video image. This sensor is a prerequisite for advanced weapon-related upgrades, like a targeting co-processor.

Bio-Detector (PL 6)

This is a specialized chemical sniffer that searches for traces of key organic compounds in the area. While it cannot detect specific life-forms or track their movements, the bio-detector can determine if life exists and what type of creatures - large carnivores, small plants, microbes, etc. - are in the area. This detector provides a -2 bonus on System Operation-*sensors* checks while searching for life signs, and the same bonus to Life-Science-*biology* checks when trying to classify the life signs.

EM Detector (PL 6)

The EM Detector is used to detect targets that are generating radio and other electromagnetic signals through radar or similar active sensors. In such a case the robot receives a -2 bonus on his System operation-*sensors* check. It is possible to locate non-emitting targets as well, but with a +2 step penalty. It can register radio and radar waves at twice the range of the radio or radar used. The EM Detector can also be used to detect x-ray, gamma, or cosmic radiation..

Radiation Detector (PL 6)

The radiation (or 'rad') detector combines a high-band EM detector with series of plates in order to detect and measure particulate (alpha, beta or neutron) radiation levels. The rad-detector provides a -2 step bonus on Physical Science-*physics*, System Operation-*sensors*, or Awareness-*perception* skill checks to spot danger or localize specific sources of radiation.

LADAR (PL 6)

The LASer Detection And Ranging system is used to pinpoint targets and determine exact distance. It is considered a passive sensor unless the target also uses a LADAR or a laser transceiver. This system helps alleviate distance issues when using ranged weaponry by reducing the range penalty by -1. It never provides a bonus, only helps alleviate the penalties caused by shooting at long ranges.

Life Recorder (PL 6)

This unit is connected to the pickup/voice box and video/holo imaging sensors in parallel with the processor. It records everything that the robot sees and hears and records the data onto a 3D or X3D crystal. This crystal can be removed after 24 hours of recording and replaced with a blank one. Without this system the robot's memory works much like human one - it uses lossy compression to store data in long term memory after a short period of time and cannot generate back 100% precise images and data.

Sonar (PL 6)

A sonar system is similar to a series of pickup/voice boxes, placed at various points around the robot's chassis that emit ultrasound pulses and use echolocation to determine the exact position of objects and creatures around the robot in a 40 meter radius. The robot cannot use the sonar to read written text because the text is on a flat surface and it appears flat to the robot. The robot literally sees sound that bounces back from surroundings, providing it with a constant 360-degree vision.

Imaging Scanner (PL 6)

Using advanced magnetic resonance technology, the imaging scanner provides an inside look at anything the robot touches. The field of view is about 10 centimeters, while the depth can be adjusted from 1 centimeter to 3 meters. It's useful for locating alarm circuits and analyzing locks, scanning packages and crates to determine contents without opening them, and can even be used in medical purposes for determining the amount and precise location of injury. In general an image scanner provides a -1 step bonus to Demolitions-*disarm*, Technical Science-*repair*, Security-*security devices*, Medical Science-*surgery* and Manipulation-*lockpick* skill checks. Some security devices can have integrated EM scanners that will detonate when they sense an imaging scanner field, so it's not always safe to use this sensor.

Weapon Detector (PL 6)

This sensor is a simple imaging scanner designed to provide a wide-field scan for dense objects. Integrated in this device is a chemical sniffer for conventional and plasma explosives. A weapon detector is not as precise as an imaging scanner but is much faster and adds the capability of sniffing out explosives. System Operation-*sensors* or Investigate-*search* are required to operate this sensor. This sensor provides a -2 step bonus for detecting metallic or hard plastic weapons.

Holo (PL 7)

A robot with a holographic imaging system gains human-grade 3D perception but it must have at least two lenses mounted at least 15 centimeters apart, much like human eyes. That will provide accurate imaging up to 5 meters. For accurate 3D vision up to 100 meters the robot needs

to have lens at least 2 meters apart, either mounted on the chassis or on limbs.

Brainprint Scanner (PL 7)

This device consists of two parts. A brainprint scanner is a device that must be placed onto the target's head. It consists of a large series of magnets that monitor brainwave activity. The scanner must connect through a socket or wireless port to an input board that is integrated into the robot. When placed on a subject it operates as an advanced version of polygraph. By examining the activity or silence of the brain's memory response centers the scanner can determine if the subject is familiar with a name, acronym, image or some other specific form of data. The device requires the questions to be phrased exactly so it is not foolproof. It provides a -2 step bonus on Interaction-*interview* or Investigate-*interrogate* skill checks.

Multiband Radar (PL 7)

This is a more powerful and sophisticated version of the standard radar system. Ranges on the ground are increased to 4 km, and up to 40 km to detect airborne targets. Multi-band radar is an active sensor and can be detected from twice its usable range.

Mass Radar (PL 8)

Mass radar, commonly known as madar, uses pulses of gravitational energy to precisely pinpoint objects that are hidden from sight in some fashion. This robot system can penetrate up to 1 kilometer of ice or water, 200 meters of rock or stone or 20 meters of nickel-iron or similarly dense and metal-rich rock. This system is ideal for locating people behind walls or hidden entrances.

Multiphase Radar (PL 8)

A further refinement of the multi-band radar, the active scanning radius is again doubled to 8 km on flat terrain and up to 80 km in air. Same as before, it can be detected from twice its usable range.

Gravitic (PL 8)

Much like the mass radar, the gravitic sensor senses gravitic waves created by all objects, but is considered a passive scanner. It can detect larger craft like tanks and shuttles up to 5 km away and airborne targets up to 25 km away. It can detect a madar signature from twice its effective range. A gravitic sensor cannot penetrate obstacles more than 10 meters deep.

Biological Senses (PL 8)

These are the standard senses humanoids have - sight, hearing, smell, taste and touch. Cloned living bodies for AI insertion must use these - biological senses require biological actuators (and all other dependencies that come with these). A robot with these senses does not require a tactile manipulator system, an ordinary hand will do just fine.

Synthetic Senses (PL 8)

These are artificial versions of the standard biological senses. They take a bit more space and power due to data-processing hardware attached to them. A robot must have synthetic tissue actuators (that have some other dependencies) in order to have these installed. These senses function exactly like the biological ones but are more precise and give the android a -1 step bonus on Awareness-

perception checks for all five senses. A robot with these senses does not require a tactile manipulator system.

4.7. Data Ports

In order for a robot to communicate with other technological equipment, it needs to have a data port. These provide various means of connectivity which can be used to establish an outgoing or incoming connection with various other systems. A robot doesn't need to have any of these systems, but virtually every robot does. Each and every system listed below can be shut down at will except the telepresence link.

Socket (PL 5)

A socket connector is the most fundamental way of connecting to any computer system, from a mainframe to a gridcaster. The robot uses a wire to plug into the system, or a wire can be used to plug into the robot. This type of connectivity provides means for easy maintenance, skill set updating and general data transfers to and from the robot.

Encryption Module (PL 5)

This is not a data port per se, but a chipset that encrypts any communication or data transfer which passes through any other data port system. Only one encryption module is required to cover all other data ports. The target must also possess this system in order to decode the transmission. This module does not provide perfect security, but adds a +3 penalty to all System Operation-*sensors* or Computer Science-*hacking* skill checks to decode the transmission.

Telepresence Link (PL 5)

Much like the wireless connector, the data is transferred through radio waves. There is one major difference though - the telepresence link is hardwired directly into the robot's processor. This allows the operator to see everything the robot sees or hears and the operator can take control of the robot's actions at any moment. This kind of link is preferable to a wireless data port when industrial robots are concerned and the operator needs to manually correct or direct them. Also, this module is regularly installed into AI remotes.

Uplink (PL 5)

A miniaturized version of a satellite dish, the uplink system allows a robot to communicate at orbital distances - with a ship or a satellite in orbit, providing that both robot and the ship know where each other exactly are, via a GPS system for example. As this system uses a directed signal when broadcasting, it cannot be used to broadcast a general signal to anyone around it, but could be theoretically used to scan for stray transmissions when used in conjunction with the System Operation-*communications* skill.

Wireless (PL 5)

The basic principle of this data port is the same as the socket connector, except the data is transmitted and received through radio waves. A robot can use this type of connectivity to connect to any system within 100 km that has a wireless port, and transfer any kind of data to it - from basic communication and video to large data bursts.

4.10. Data Port Systems

Type	PL	CP	PP	cost
Socket	5	1	-	\$50
Encryption Module	5	1	1	\$700
Telepresence Link	5	1	2	\$450
Uplink	5	5	10	\$3K
Wireless	5	1	2	\$300
P2P	6	3	5	\$5K
Mass comm	7	20	15	\$15K
Telepathic Transc.	8	15	5	\$50K

PL: Progress level at which is available.
 CP: Chassis Points required for installation.
 PP: Power Points required to operate.
 Cost: Cost of the system.

P2P (PL 6)

A point-to-point communication module uses a direct laser beam to transfer information. The principle is very similar to a wireless data link, but the communication is secure and cannot be intercepted. Any obstacle in the beam path will break the communication so a direct line of sight is needed. This laser system is capable of transferring data up to 10000 km regardless of atmospheric conditions.

Mass Comm (PL 7)

A miniaturized version of the mass transceiver, this system allows the robot to transfer data by gravitational waves. When near a planet or a similar astral body this allows a wireless-type communication up to 100 million km. However in open space mass comm has a drastically reduced range due to the lack of gravity-inducing objects. The target needs to have a mass receiver in order to receive this type of communication.

Telepathic Transceiver (PL 8)

A Fraal invention, the telepathic transceiver is a powerful device that relies on an electropulse-to-ESP translation method. It allows the robot to contact an organic being up to a 1000 km away and burst data to it. The target needs to have a nano-computer installed in their brain to process this data, but no other equipment is necessary.

4.8. Limbs

Mercenary: There's something out there... it got the other submersible already.

HK-47: Suggestion: Perhaps we could dismember the organic? It would make it easier for transport to the surface.

Mercenary: Hey! Y-you... you can't rip me to pieces! I'll die!

HK-47: Amendment: I did forget that. Stupid, frail, non-compartmentalized meatbags!

Most robots have limbs of some kind though they are not mandatory. A tiny robot might have all the tools it needs integrated directly into its chassis, and a huge tank-like robot may rely on tracks and integrated weaponry. The limbs provide options like manual dexterity, humanoid-like propulsion (walking) and storage space, but require extra actuators to operate them.

Each limb requires 5% of Chassis Points to be installed. These limbs can either be used as arms or legs. A limb provides the robot with 5% extra Chassis Points. This is not much because the actuators to operate the limb take nearly all of its internal space. In effect, a robot removes 5% of its

Chassis Points from chassis and relocates them in a limb. Limbs are free of charge.

Note: Diminutive robots cannot use limbs, they are too small.

One may wonder why even define limbs in the first place when they give as much Chassis Points as they take away. Here are but a few reasons:

- A robot needs at least two limbs that will serve as legs in order to walk. Diminutive Robots can't walk.
- Having a weapon operated by a limb is much different that having it installed in the chassis.
- If the weapon is a melee-based one it must be integrated into the limb or used by a limb.
- Most propulsion methods can be installed into limbs and various combinations can provide some very unique locomotive solutions.
- Special equipment like sensor or tool gauntlets that are not designed for robots by default, but for biological humanoids, must be integrated into a limb and operated by another limb that has a hand manipulator installed. Of course, a gauntlet may simply be strapped over a robot's arm, but then it won't benefit from any protection the robot's armor might provide.

In case of the bone chassis system (commonly referred to as a "skeleton") then:

- The robot receives two arms with hand manipulators and two legs with feet propulsion system for free. These require no Power Points and no Chassis Points.
- Neither arms nor legs permit any Chassis Points for other system installation (besides the already installed hands and feet), but don't require any, either; they are biological limbs and are subject to biological hero rules.
- In case the biological actuators are used, then the hands and feet provided are mandatory and non-removable. You can't replace a human's foot with a wheel; it would require a power supply, cabling to the brain, etc.
- It is possible for a robot with synthetic actuators to refuse these hands or feet, in favor of some other manipulator or propulsion system. In that case he needs to pay the cost of the other system installed, provide enough power points for it to function, and treat the limb as before - taking 5% space and providing 5% Chassis Points of installable space.
- Cyberware (endoskeleton and the like) is another thing entirely, see **Chapter 7.1 - Robots and Cyberware**.

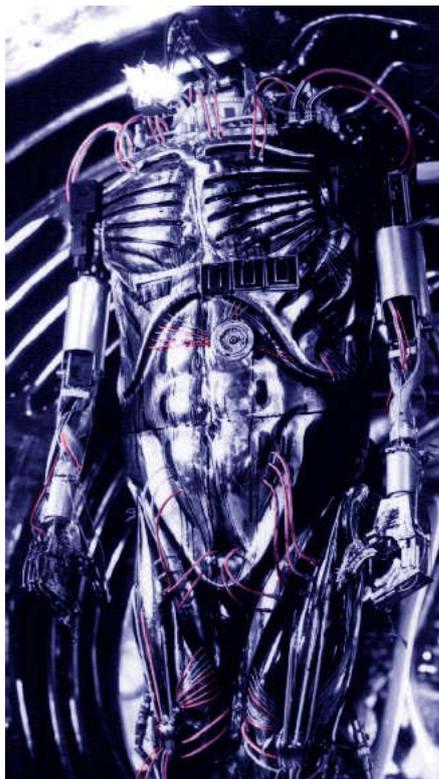
Example: A robot with bone chassis and synthetic tissue actuators (a freshly created body for AI installation) wants both legs to run on small tracks instead of feet and one arm removed in favor of a tentacle (consider this robot to have the Erratic AI flaw - see **Chapter 5.4 - Flaws**). He needs to provide 10% chassis space for two limbs (legs), each of which will provide 5% Chassis Points, and can hold the track propulsion system. The removed arm can simply be replaced with a tentacle system that needs 4 Chassis Points of space and requires 2 Power Points to function (see below for detailed descriptions of these systems). The remaining arm with the hand provides no space for further system installation (see **Chapter 7.1 - Robots and Cyberware** for exceptions), but the hand manipulator requires no

power (it's a biological hand, not a robotic one, covered in skin and powered by nerves and muscles).

To define limb usage very clearly: robots are ambidextrous. They can write with either hand equally well, but they do not have an AI's multitasking capabilities. Even the AIs at higher Progress Levels that are installed into a robot chassis ordinarily do not have these skills. That means that there is a cumulative +2 step penalty for each non-mundane task that the robot is doing with more than one arm at the same time. Operating a vehicle is mundane enough, as well as perhaps surgery - where each hand performs a slow and simple task.

The penalty to shoot two guns at the same time is +2 for each gun. In case of a robot with 3 arms and 3 guns the penalty is +4. 4 arms and 4 guns would carry +6 penalty, and so on. Multitasking capabilities offset these penalties, but are rarely present.

A shrewd designer might ask "What if I install one gun in the chassis directly and fire two guns normally? By your rules the penalty would only be +2." No, even the installed gun has its actuators that are responsible for firing it, and has an aiming system, and for the purposes of multitasking this would again be considered a "3-arm" action and would carry +4 penalty for each gun.



Hector, *Saturn 3*, 1980. An example of a robot with limbs but no head. Hector had some serious personality issues, falling in love with a human and all...

Table 4.11. Manipulator Systems

Type	PL	CP	PP	Cost	Limb
Claw	5	1	1	\$50	any
Extendable	5	3	1	\$300	yes
Hand	5	1	1	\$200	yes
Tactile	6	2	2	\$3K	yes
Tentacle	6	4	2	\$5K	no
Gravitic Projector	7	4	5	\$10K	any
Fraal Telekinetic Beam	8	5	10	\$20K	any

PL: Progress level at which is available.

CP: Chassis Points required for installation.

PP: Power Points required to operate.

Cost: Cost of the system.

Limb: Indicates if a manipulator has to be installed in a limb or on the chassis directly.

4.9. Manipulators

Manipulators are appendages that provide a robot with the means to manipulate objects around them. They range from the most primitive types used by PL5 industrial robots to very complex appendages that are required for precision work like surgery. If a manipulator is attached to a limb, take care of how many Chassis Points remain in that limb for other purposes. Some manipulators like hands mandate the use of limbs.

Note: Wherever a “normal weapon” is mentioned in the text it applies to a standard weapon that a non-robot can use either by gripping (melee-based), or by aiming and pulling a trigger (range-based).

A robot trying to use three weapons at once - one with a hand, other integrated and third operated by a gravitic field for example, or any other combination, would still fall under the “3 arm” rule and suffer +4 penalty on each weapon check, unless it has true multitasking capabilities.

Claw (PL 5)

The most basic manipulation device, the claw looks much like a pincer and can grab some solid objects. Due to the lack of an opposable thumb, fine manipulation of objects is impossible. Most industrial robots have this option due to its low cost and small space requirements. It can be installed into a limb or the chassis directly. This manipulator allows a robots to use normal melee-based weapons and even then only when this manipulator is installed into a limb.

Extendable (PL 5)

The extendable system is not a manipulator in itself, but instead an upgrade to existing manipulators. If installed with another manipulator like a claw or a hand, it can extend the robot’s reach with a telescopic shaft. It requires a limb to be installed in, and can extend up to 3 meters in length.

Hand (PL 5)

An improvement over the claw system, a hand usually features five digits, one of which is an opposable thumb. This allows the robot to operate with objects like a human would, but does not provide the fine sensory information of touch. The number of digits is variable, as is the size of the hand. A hand system must be installed onto a limb. This manipulator allows the use of all normal weaponry. In case the robot has a bone chassis (skeleton), then this system is provided for free (if the designer so desires), requiring no space and no power.

Tactile (PL 6)

A further refinement of the hand system, it features the same infrastructure but with extra sensors. A robot with the tactile system can sense the temperature, moisture and roughness of an object, allowing it to perform precise work like surgery. A tactile system looks very much like the hand manipulator, allows the use of all normal weaponry, and also needs to be installed in a limb.

Tentacle (PL 6)

A manipulator rarely used due to its frightening aesthetic properties, it is sometimes the only one capable of reaching normally unreachable places. From a scientific point of view it is even more dexterous than a hand and is capable of performing almost any feat with an object. This manipulator allows the use of normal weaponry and even gives a bonus to all melee-based attacks. Due to the constant shifting nature of a tentacle and its seemingly unpredictable movements at odd angles, a robot with this manipulator gains -1 step bonus on all melee-weapon checks. This manipulator replaces a limb and cannot be installed in one.

Gravitic Projector (PL 7)

A Gravitic Projector uses miniature gravity inducing engines that have a rather short range - up to a meter. However physical contact with an object is not required in order to manipulate it. It requires a lot of energy to function and its dexterity is much like that of a claw system. It does not have to be installed on a limb. Due to problems of manipulating complex gravitic fields, a robot with this system cannot use normal ranged weaponry, only melee-based ones, and it does not receive any special bonuses or penalties.

Fraal Telekinetic Beam (PL 8)

Using an electropulse-to-Telekinesis converter a robot can convert energy into pure telekinetic force, allowing a greater dexterity than the crude gravitics provided. This system does not have to be installed on a limb, and is similar to a hand for purposes of what can be done. The robot can operate objects up to 5 meters away and can use all normal weaponry. It even receives a -2 step bonus on melee-weapon checks due to a complete lack of constraints in the weapon’s movement.

Table 4.12. Propulsion Systems and Relevant Info

Type	PL	CP	PP/CP	Cost	Cost/CP	MSTR	MDEX
Track	5	5%	0.5	\$100	\$50		
Wheel	5	5%	1	\$500	\$100		
Foot	5	5%	0.5	\$1K	\$350		
Hydro-Jet	5	10%	1	\$10K	\$500	8	6
Gyrocopter	5	15%	1.5	\$15K	\$1K	6	6
Hover-Jet	6	10%	2	\$20K	\$2K	8	9
Zero-G Thrusters	6	10%	1.5	\$15K	\$2K	7	6
Slither	6	5%	2	\$5K	\$750		
Gravitic	7	10%	2.5	\$20K	\$2K	8	12
Ion Engine	7	20%	3.5	\$150K	\$15K	16	4

PL: Progress Level at which is available

CP: Chassis Points required for installation

PP/CP: Power Points per one Chassis Point required to operate

Cost: Cost of the installation

Cost/CP: Additional cost per one Chassis Point of installation, independent of the base installation cost.

MDEX & MSTR: Maximum dexterity and strength the system allows if a robot doesn't have actuators. Lack of these statistics indicates a robot must have actuators to use the propulsion system.

4.10. Propulsion

Actuators control the movement of a robot's limbs, but there are other methods of propulsion. There is no limit on the amount of propulsion systems installed simultaneously. While it is possible for a robot to have one wheel and one track, each mounted on a leg, such propulsion is quite unstable and inefficient.

Note: In the case of a robot with no actuators, its strength and dexterity scores must be calculated through its propulsion system. An example is a space exploration robot with no limbs and an ion engine, or a diminutive hovering camera-probe (AIs often use these probes, called *A-Eyes*, to survey surroundings). If a robot has actuators then ignore the maximum dexterity and strength values for these propulsion systems.



Micro-robot built at Sandia, 2001. Diminutive robot that uses tracks but no limbs. Can park on a dime and turn on a quarter.

Track (PL 5)

A track can be mounted directly into a chassis or onto a limb. A robot requires at least two tracks to receive the benefit most tracked vehicles, such as tanks, enjoy – the ability to traverse virtually any terrain. This system is slow and reduces the overall land speed by 25%

Wheel (PL 5)

A four wheeled solution has been used since PL1, and for a good reason - wheeled robots receive a 50% bonus on their land movement rates but cannot traverse through difficult terrain or climb stairs. A wheel can be mounted on a limb, and if such a system has at least five limbs with five wheels it is called a pentapod system. This allows the robot to traverse difficult terrain and climb stairs and the like, but

will receive a -25% speed penalty in those circumstances. A two-wheel solution is also possible but the robot needs at least an Ordinary-quality processor to maintain balance. In this case the wheels are side by side on each side of the robot, rather than one in front of another.

Foot (PL 5)

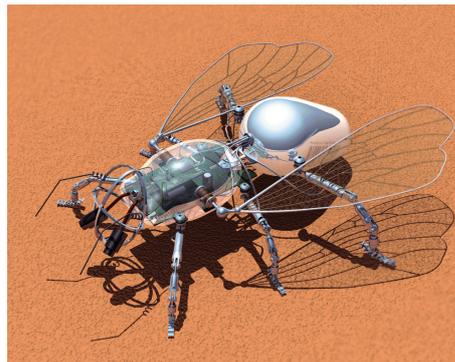
In an effort to create a humanoid-shaped robot the foot system was created. It's a relatively complex method because of the difficulties of maintaining balance, so at least an ordinary-quality processor is required. Movement rates receive no bonuses or penalties, and closely mirror those of non-robotic humanoids. If the robot has a bone chassis, this system requires no space, no power, and is provided free of charge as a biological or synthetic tissue appendage.

Hydro-Jet (PL 5)

The hydro-jet is a big turbine-based propulsion system which allows the robot to gain a swim-rate. A robot must buy at least 3 ranks in the Movement-*swim* skill, and must be able to use them; its processor must support at least 3 ranks in this skill.

Gyrocopter (PL 5)

A Gyrocopter is a single-propeller system that uses gyroscopes to maintain stability and counter-force required for straight flight. It's quite massive, compared to other systems, and requires a lot of power to maintain lift. Most propellers have a five meter radius so this system is only usable outdoors. Any contact between the propeller and an object while flying will most likely end in disaster. A robot needs at least 3 ranks in Acrobatics-*flight*. There are other, more advanced versions of gyrocopter which utilize wings, but for all effects and purposes such flying mechanisms fall under this category and have the same prerequisites.



Hover-Jet (PL 6)

Miniaturization of turbines and their increased effectiveness leads to the development of these relatively small dual-turbine systems that do not require massive propellers, but work on a very similar principle. The air is pushed downwards and the resulting force pushes the robot upwards. If used very carefully, it can be used indoors, at places such as elevator shafts and the like. Due to relative ease of use, a robot needs only 1 rank in *Acrobatics-flight*.

Zero-G Thrusters (PL 6)

Zero-G thrusters come with their own fuel cells and allow the robot to operate for short periods of time in open space. Their power requirements are much smaller than of those designed for atmospheric use due to the lack of gravity and air resistance. The operational time of these thrusters is about 6 hours before they need to be recharged. The maximum acceleration in open space is about 40 meters per second squared. That means that after 2 seconds the robot would cross $(40m + 2^2 \cdot 40m) = 120m$ and would be traveling at 80m/s. After three seconds it would cross 240m and would be traveling at 120m/s. There is no top limit on speed, but keep in mind that collisions at these speeds are always fatal. These thrusters will not function inside an atmosphere. A robot needs at least 3 ranks in *Acrobatics-zero-g training* to use these properly and in a safe fashion.

Slither (PL 6)

An advanced form of track system, the entire chassis is covered by a special sheet that functions as a single track. The result is an excellent speed but the inability to use any limbs, systems or weapons that need to protrude outside the chassis while traveling. The average speed rate is increased by 25%. This type of locomotion has no difficulties with rough terrains and retains the speed bonus at all times.

Gravitic (PL 7)

Gravitic induction engines function by creating a virtual gravity well that fools the robot's mass into falling in a certain direction. The speed capabilities are excellent, and reaction times very fast, but power requirements and overall cost are enormous. The system works in any environment including vacuum and very tight spaces. Changing gravity fields is much easier than maneuvering a jet or a propeller and a robot doesn't need any special skills to fly or hover. This makes gravitic induction engines perfect for even the smallest systems like diminutive flying probes.

Ion Engine (PL 7)

Miniaturization allows the installation of ship-grade ion engines into a robot chassis. Such systems are on par with starship ones and allow the robot to explore space for 1-2 years before refueling. An ion engine has a maximum acceleration rate of 250 meters per second squared and no limits on speed, making it a perfect propulsion method for short and medium range robotic probes and scouts. In order to use this system the robot needs at least 3 ranks in both *Acrobatics-zero-g training* and *Navigation-system navigation*.

4.11. Casing

Every robot should have a casing, except when there is a very special reason against it. Casing protects the robot from dirt and excessive moisture, helps regulate the cooling, either passively or by installing micro-coolers inside an airtight casing, and serves as protection against accidental or deliberate damage. It is possible to have two different casing types - an armor and an active system above it. These active systems are discussed later. Every casing takes up at least some space, and usually the heavier it is the better the protection.

Each active casing comes with its own cabling that's already calculated in the space requirements. Most battle casings have special requirements in the form of certain skills the robot must possess to use them.

A super-heavy armor cannot be fitted on medium-sized and smaller robots. Heavy armor cannot be fitted on small-sized and smaller robots. Medium armor cannot be fitted on tiny-sized and smaller robots. Tiny and diminutive robots are restricted to light armor.

Note: Increased space percentage rates, compared to *Warships* rates, indicate the ease at which a starship is covered, compared to a robot which has many more moving parts. Different protection rates (*Dataware* armors were comparable to *PHB* armors on a 1=1 basis) indicate that a robot is not a biological hero and it's much easier to protect a robot than to protect a biological creature. That is why the armor statistics are slightly increased overall, but the prices are increased exponentially.



Alex J. Murphy, *Robocop*, 1987. Titanium reinforced kevlar saved his life numerous times, an example of a pseudo-robot with a "Hardened Casing" perk.

Standard Casing (PL 5)

A standard casing is a sheet of thin metal that protects the robot from dirt and rain. It is usually treated against rust. Easily punctured, it is only marginally better than human skin. Advantages are a negligible cost and small space requirements.

Photocell (PL 5)

Standard photocells cover the robot's chassis and provide power. See **Chapter 4.2 - Power Supply** for more information on this system's primary function. Photocells are surprisingly effective at converting even weapon-grade energy beams into power.

Kevlar (PL 5)

An armor made of "bulletproof" titanium-reinforced ceramic plates provides basic armor protection. Used originally for robots engaged high-risk missions like mine-sweeping, it is later replaced with more advanced polymeric armors.

Polymeric (PL 6)

Using carbon tubing to decrease weight, this armor replaces kevlar. Though lighter, carbon nano-tube materials and fiberglass offer only marginally higher protection rates. This casing is later replaced with cerametal.

Alloy (PL 6)

An improvement over standard casing, this armor is created of carefully pasted vanadium steel plates. Cheap and light it offers a reasonable protection to weight ratio. It's the best protection in this field until the invention of neutronite.

Reflective (PL 6)

An advancement of the original photocell casing with the refinement of polished metal, this armor offers good protection against energy-based attacks but is still easily punctured by anything else.

Table 4.13. Casings and Relevant Skills

Type	Li	Hi	En	CP	Skill	Cost/CP	Toughness
<i>PL 5</i>							
Standard, light	d4-2	d4-2	d4-3	5%	-	\$50	Ordinary
Photocell, light	d4-2	d4-2	d4	10%	-	spec.	Ordinary
Kevlar, medium	d6-3	d6-2	d4-2	10%	Ao	\$1.5K	Ordinary
Kevlar, heavy	d6-1	d6-1	d6-2	15%	C2	\$2.5K	Ordinary
Kevlar, super-heavy	d4+2	d4+3	d4	20%	C4	\$4.5K	Good
<i>PL 6</i>							
Polymeric, light	d4-1	d4-1	d4-2	5%	-	\$500	Ordinary
Reflective, light	d4-3	d4-2	d6-1	5%	-	\$500	Ordinary
Alloy, medium	d4+1	d4+1	d4	10%	Ao	\$1.5K	Ordinary
Polymeric, medium	d4	d4	d4-1	10%	Ao	\$1K	Ordinary
Reflective, medium	d4-2	d4-1	d6	10%	Ao	\$1K	Ordinary
Alloy, heavy	d6+1	d6+1	d6	15%	C2	\$3K	Ordinary
Reflective, heavy	d4	d4	d8+1	15%	P2	\$2K	Ordinary
Alloy, super-heavy	d6+3	d6+3	d6+2	20%	C4	\$6K	Good
<i>PL 7</i>							
Cerametal, light	d6-1	d6-1	d6-1	5%	-	\$1K	Ordinary
Cerametal, medium	d4+1	d4+1	d4+1	10%	Ao	\$2K	Ordinary
Neutronite, medium	d6+1	d6+1	d6+1	10%	Ao	\$5K	Ordinary
Reactive, medium	d4+2	d6	d4	10%	Ao	\$1.5K	Ordinary
Cerametal, heavy	d8	d8	d8	15%	C2	\$4K	Ordinary
Neutronite, heavy	d8+1	d8+1	d8+1	15%	C3	\$10K	Ordinary
Reactive, heavy	2d4+1	d8	d4+1	15%	P3	\$3K	Ordinary
Neutronite, super-heavy	d8+3	d8+3	d8+3	20%	C4	\$20K	Good
Reactive, super-heavy	2d4+3	d8+2	d4+3	20%	P4	\$6K	Good
<i>PL 8</i>							
Skin	-	-	-	5%	-	\$500	Ordinary
Synthetic skin	d4-3	d4-3	d4-3	5%	-	\$700	Ordinary
Crystallis, light	d6-1	d6	d6+2	5%	-	\$2.5K	Ordinary
Nanofluidic, light	d8-1	d8-1	d8	5%	Ao	\$5K	Ordinary
Crystallis, medium	d6	d6+1	2d4+1	10%	Ao	\$5K	Ordinary
Nanofluidic, medium	2d4	2d4	2d4	10%	P2	\$10K	Ordinary
Nanofluidic, heavy	2d4+1	2d4+2	2d4+1	15%	P3	\$20K	Good
Nanofluidic, super-heavy	2d4+3	2d4+4	2d4+3	20%	P4	\$40K	Good

Li: Armor protective value against Low Impact damage.

Hi: Armor protective value against High Impact damage

En: Armor protective value against Energy based damage.

CP: Chassis Point number required for the installation.

Skill: Skill required to operate armor without penalties. Ao indicates only Armor Operation broad skill is needed. P# or C# indicate Powered armor or Combat armor speciality skills and required number of ranks to negate penalties.

Cost/CP: Cost per one Chassis Point of installation. If the armor takes less than 1 Chassis Point treat as 1 Chassis Point for purposes of cost.

Ceramel (PL 7)

For a long time the ultimate in ceramic processing, ceramel armor relies on sheets of ceramic that has ductile strength of metal. It forms an overall good protection against all types of attack and is relatively cheap.

Neutronite (PL 7)

A further condensing of the alloy armors, neutronite uses a “weave” of neutrons condensed at incredible rates between metal sheets, creating an ultra-dense material that weighs about 5 times as much as lead. While offering excellent protection against all forms of attack, a robot needs a lot of programming to use it properly and the cost is very high. Military grade robots are often equipped with this kind of armor.

Reactive (PL 7)

Formed by compressing layers of insulating gel or high-pressure air between ceramel sheets, this armor is excellent at dissipating blows from low impact weapons. Unfortunately, bullets and energy beams may puncture it before it has time to dissipate the energy. Nevertheless, it's an improvement over ceramel.

Crystallis (PL 8)

Replacing polished metal from reflective armor with a crystalline lattice, a massive improvement is gained in energy reflecting capabilities, making crystallis armor the last word in energy protection. However attacks with blunt objects and high-impact bullets still readily puncture it.

Nanofluidic (PL 8)

An improvement over reactive armor, this casing is formed by replacing the gel with a gel-like substance consisting of nanobots, producing the best armor there is. The nanobots concentrate on blunt impact spots reinforcing the armor even before the impact occurs, and through circulation easily cool down areas that are affected by energy weapons. The astronomical price of such armor reflects its quality and availability issues - this is a military-grade armor, unavailable to general public.

Skin (PL 8)

Biological skin, it is required for a robot with biological actuators, and can not be installed on anything else. As it's basically the same skin any biological individual has, it provides no protection whatsoever.

Synthetic Skin (PL 8)

A pseudo-living tissue, it has improved regenerative properties over the normal human skin, and can be strapped over any casing and actuators. The protection rate is only marginally better than its biological counterpart.

4.12. Weapon Support

Robots often pack weapons. Be it stutter pistols for self-defense or military-grade heavy cannons, a robot often needs some armaments. While it is possible for a robot with appropriate manipulators to use weapons designed for humans, this approach is inefficient. Integrated weapons are smaller, have larger ammunition magazines and are usually hidden from view. Also, a robot's control over them can be greatly enhanced through scopes already integrated into robot's sensors. In the case of melee weapons the robot can use the very mass of its body or limb to deliver a devastating blow.

Ranged weapons can be integrated either in the chassis or in limbs. Melee weapons must be integrated into limbs. There are restrictions on ranged weapon integrations - a small (or smaller) sized robot can integrate only pistols. A medium robot can integrate an SMG or rifle-based weapon. A large robot can integrate a heavy weapon. Diminutive robots cannot integrate weaponry. While a robot may have several weapons installed in a single limb or chassis, it may use only one from the same source at the same time. For example: a robot with two arms and hands holds two pistols, but also has a pistol integrated in each of these arms. It can only fire two - one from each arm - at the same time. One of these two fired could be integrated and other held in the hand.

A single Chassis Point dedicated to weapon support systems can hold a weapon up to 0.5 kg in weight. If a weapon weighs more, more Chassis Points must be used. This requirement is different from the Storage Space system (see **Chapter 4.15 - Miscellaneous**) because of the extra weight and volume of actuators, targeting systems and cabling that an integrated weapon needs. Remember that limbs have only so much space in them, and it is not possible to use 3 Chassis Points from a limb and 3 from some other limb or from chassis to hold a 3 kg weapon.

Also, these holders and grips described below are not storage space. They hold a stripped and customized version of a weapon that cannot be easily removed, together with its actuators and targeting systems. Removal of an integrated weapon can take from a minute up to half an hour, depending on the complexity of the weapon and its systems. This would be no different than performing a maintenance to install or deinstall any other robotic system. If you wish only to store a normal weapon inside a robot (perhaps to pull it out and use with a hand manipulator) then you need Storage Space system, as described later (again, see **Chapter 4.15 - Miscellaneous** for details).

Most powered weapons (laser, mass, plasma, arc, particle and stutter weaponry) use energy. If integrated, they can be powered from the robot's own power supply, rather than having an energy clip. Power Point to energy charge ratio is 1:1; for example a laser that can burst or auto-fire 10 shots in a combat phase would need 10 Power Points to operate. If using a single shot mode then it uses only one Power Point. Due to large power demands of most energy weapons, robots that use them either have a separate or larger power supply, invest in high-quality cabling or simply use standard power clips in a magazine.

The cost of the integrated weapon is not covered by **Foundry**, consult the *PHB* or specific setting *Arms and Equipment guide*. Some safe guidelines are: pistols, SMGs and rifles cost double their normal price due to extra customization that needs to be performed before integration. Heavy weapons cost 50% more than usual since they already

have vehicle-mounts of some kind which need only to be customized to robot needs. Melee weapons cost 25% more than usual as they have to be processed before integration, but this process is not as long as with ranged weaponry.

Weapon Grip (PL 5)

Basically designed for tools, this grip system attaches a weapon to a limb, and immobilizes it. It includes a power socket for powered melee weapons, and a stress regulator. The weapon, when not used, can be retracted inside the limb.

Pistol Holder (PL 5)

The first robot weapon system ever to see the light of the day, a pistol holder integrates a pistol that has been stripped of the handle and other unnecessary mechanisms, provides an electronic security lock, and uses actuators to point and fire the weapon. May require a magazine.

SMG Casing (PL 5)

Much more complex than a pistol holder, the SMG casing provides its own fire control, and is more reliable than a standard sub machine gun system. Other functions are the same as the pistol holder provides. An integrated SMG may require a magazine.

Rifle Bedding (PL 5)

The rifle bedding system is the first weapon system that presented an engineering problem, mainly because a rifle creates considerable recoil which has to be regulated. This problem is solved through a series of heavy duty recoil suspension systems, which are later replaced by gravity pads. Other functions mirror the SMG casing system. An integrated rifle may require a magazine.

Heavy Mount (PL 5)

Heavy weapons are never stored inside a limb, but are rather mounted onto one. Placing them inside a limb would create engineering problems with recoil and firing solutions. Heavy mounts are used to help alleviate the shock to the system, provide heavy cabling where needed and regulate ammunition loading. They also help with temperature regulation, often including stand-alone cooling systems. An integrated heavy weapon may require a magazine.

4.14. Weapon Support Systems

Type	PL	CP	PP	C/CP
Weapon Grip	5	var.	-	\$100
Pistol Holder	5	var.	-	\$150
SMG Casing	5	var.	-	\$200
Rifle Bedding	5	var.	-	\$250
Heavy Mount	5	var.	-	\$350
Magazine	5	var.	-	\$200
Auto-Loader Unit	6	1	1	\$2K
De-Jammer	6	1	1	\$1K
Eject System	6	1	-	\$500
Mass Increaser	7	4	5	\$5K

PL: Progress Level at which is available.

CP: Chassis Points required for installation.

PP: Power Points required to operate.

C/CP: Cost per one Chassis Point of installation.

Magazine (PL 5)

While it's a reasonable practice to include energy-based weaponry onto a robot, it is not always possible to do so or the power requirements would be too high. Magazines can be used to safely store ammunition and feed it either directly to the weapon or to the auto-loader unit. One Chassis Point of magazine space can hold up to 50 charges distributed through separate clips (see appropriate weapon description for clip sizes). As always, changing clips requires some minor amount of time. If the ammunition is larger than usual - flame-thrower fuel, grenades or rockets, then magazine is configured on 1 Chassis Point = 1 kg ratio. Consult the weapon description - rockets usually weight about 3 kg, grenades 0.5 kg, and fuel 0.2 kg per shot.

Note: A magazine for a certain integrated weapon must be installed in the same body part as the weapon. A separate magazine is required for each weapon the robot has installed if that weapon is not directly connected to the power supply. An energy weapon that is connected directly to the power supply may still be connected to its dedicated magazine and use both sources as needed.

Auto-loader Unit (PL 6)

A highly sophisticated system that carries a lot of benefits. The installation of this system transforms all magazine space it is connected to into a single clip for purposes of reloading the weapon. The auto-loader unit must be installed in the same body part as the weapon and its magazine. If the weapon is powered directly from the robot's power sup-



Robby, *Forbidden Planet*, 1956. It did not feature integrated weapons, rather weapon disablers.

ply then it doesn't require this unit unless that weapon also has a dedicated magazine. One autoloader unit can serve only one weapon - it is directly connected to the weapon's systems and to its respective magazine.

De-Jammer (PL 6)

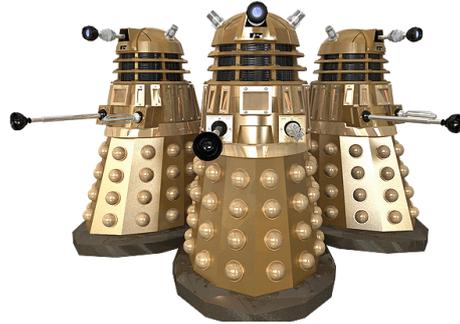
A redundancy unit, the de-jammer features a series of sensors and actuators that monitor a weapon's status, can quickly perform basic check of a weapon, and correct possible problems. It takes only a minute for the de-jammer to locate a potential cause of trouble - a jammed bullet, a defective mechanism or any other, and correct it if possible. In case it is necessary to replace a part of the weapon the de-jammer will safely shut down this weapon system. The de-jammer needs to be installed in the same body part as the weapon and can serve only the weapon it is connected to.

Eject System (PL 6)

Maintenance of an integrated weapon system takes more time than performing it on a normal weapon. The weapon is usually integrated deep inside a robot, surrounded by recoil-control actuators and other systems and can be very inaccessible. The eject system serves the purpose of quickly ejecting the entire weapon system plus any optional systems that are installed on the weapon. This procedure takes only a few seconds, and it becomes a very simple task to replace a melted barrel with a new one using the eject system, though the technician still has to be familiar with the weapon he is repairing. The eject system needs to be installed in the same body part as the weapon, and can serve only the weapon it is integrated with.

Mass Increaser (PL 7)

Virtually increasing the mass of a robot's limb, a robot can punch harder and gains extra boost when using integrated melee weapons. All damage a robot does when fighting unarmed with a limb that has this system installed is considered to be done by a one category larger robot. See **Chapter 5.6 - Other** for brawling damage rates. When using an integrated melee weapon the damage a robot does is increased by 2. The mass increaser is not connected to a specific integrated melee weapon - if the robot has two or more melee weapons integrated into its limb, this system provides a bonus to them all. However, remember that only one weapon is usable simultaneously from a single body part. The system can be installed in the chassis but then the bonus goes only for ramming the opponent - the chassis is considered to be one category larger.



Daleks, *Doctor Who*, 1966-2006. Terrible energy-based weaponry called the "Death Ray" for a reason, integrated in the chassis, along with the plunger. Also have almost impenetrable ablative shielding, converting bullets themselves into energy.

4.13. Defenses

A robot is a very valuable investment. Military-grade robots especially so, since they almost always carry top-notch equipment. That is why a number of different systems are available to protect them and to help the long-term budget needed for robot maintenance.

Only one screen, shield or deflector can be used at the time. Attempting to power up two systems simultaneously will knock out both. Laser interference systems and gravity nullifiers can operate independently of other active systems. Laser interference system cannot operate at the same time as a stealth projector or displacement screen.

Every system can cover only so much of the robot's surface. This is represented by the Cover statistic in the table below. If a 100CP robot wants magnetic screen coverage, it must either buy 4 separate systems (or one system four times larger than listed) at four times the price and power requirements. Also, if a specific defensive system is unable to cover the whole of a robot's chassis at any given time, the entire system fails. Redundancy is certainly possible to help alleviate this circumstance, for instance in the case of battle damage. For example, if a magnetic screen that is assembled of 4 separate units falters and only 3 units remain operational, the system fails since it only covers 75 out of 100 robot's Chassis Points. Such a robot could buy 5 units, effectively covering 125 CP, so that if one part is lost the remaining 4 still cover the entire robot and remain functional. This goes for every defensive system.

4.15. Defense Systems

Type	PL	CP	PP	Cover	Cost
Laser Interference System	6	2	2	75	\$2K
Magnetic Screen	6	4	2	25	\$2K
Gravity Nullifier	7	2	5	75	\$3K
Deflector Inducer	7	1	2	25	\$2K
Particle Screen	7	3	3	25	\$6K
Capacitor Screen	7	3	4	25	\$14K
Ablative Shielding	8	2	3	25	\$20K
Displacement Screen	8	2	4	25	\$15K
Stealth Projector	8	1	5	75	\$15K

PL: Progress Level at which is available.

CP: Chassis Points required for a single installation.

PP: Power Points a single installation requires to operate.

Cover: Coverage (in Chassis Points) that a single installation provides.

Cost: Cost of a single installation.

Laser Interference System (PL 6)

The laser interference system uses a series of small laser projectors to actively seek possible threats and interfere with targeting systems such as optical scopes, IR scanners and laser pin-pointer systems. The system adds a +2 penalty against ranged attacks that are made using these scopes.

Magnetic Screen (PL 6)

The electromagnetic screen uses a powerful magnetic field to protect the robot from attacks that use either metal ammunition (charge, sabot, flechette, needler), or weapons that fire electrical discharges (arc gun). It has no effect on beam weapons (laser, plasma, mass) or weapons without metallic ammunition (stutter). All affected weapons receive a +2 penalty on attack rolls. The screen can flicker out when the robot is firing, so it has no deleterious effect on the robot's attacks.

Gravity Nullifier (PL 7)

A variation of the mass increaser concept, this system serves an opposite purpose. It creates an inverted gravity field around the robot so that impacts do less damage. Every low impact and high impact attack has its damage reduced by 2. It has no effect on beam and electrical discharge weapons. The robot suffers the same problem while this field is active, so all attacks it makes that can be affected by this field deal 2 less damage.

Deflection Inducer (PL 7)

A variation of the gravity nullifier, the deflection inducer does not try to stop the impact but changes its course. Distortion of gravity will affect all weapons including beams, and all attacks against the robot will suffer a +2 penalty. Unfortunately, similar to the gravity nullifier, it affects the robot with the same penalty.

Particle Screen (PL 7)

A particle screen functions on a different principle than gravity or electromagnetic screens - it generates an interposing wall of subatomic particles (alpha particles are most commonly used - helium nuclei stripped of their electrons). The incoming attacks are then scattered or absorbed by the particles, lessening or even negating the impact. This technology offers excellent protection but is rather bulky. It adds d4/d4/d6 to the robot's armor rating. The particle screen can flicker out when the robot attacks and doesn't hinder the robot in any way.

Capacitor Screen (PL 7)

A forerunner of ablative shielding, a capacitor screen creates a field of ionized particles from the air molecules in its tanks. These particles provide phenomenal protection: the capacitor screen upgrades the robot's armor toughness to Good against low and high impact attacks, and to Amazing against energy attacks. In addition, it reduces every low and high impact attack by 4s/2w/1m, and energy attacks by 6s/4w/2m. For example, if an energy weapon deals 8 wounds to the robot, the screen will reduce the attack to 4 wounds before secondary damage or the robot's armor is taken into account. Unfortunately every attack helps fill up the system's capacitors and they will shut down after d6+1 attacks. The cool down time is 2 hours, after which the system can be turned on again.



HK-47, *Knights of the Old Republic*, 2003. This mod shows our favourite robot supporting cast member wearing a stealth projector of sorts - a camouflage to blend against the background.

Ablative Shielding (PL 8)

Much like the capacitor screen, an ablative shield dissipates and absorbs attacks, and converts them into energy. This energy is then stored into special capacitors. The improvement over the capacitor screen is that all attacks are converted into harmless energy, but that energy needs to go somewhere, and the systems capacitors can store only so much. Each Chassis Point dedicated to this system can store up to 10 Shield Points of energy. Incoming damage is converted into shield points at this ratio: Stun - 1 point, Wound - 2 points, Mortal - 4 points. After the capacitors are full the system shuts down until it cools off. The ablative shielding has Good toughness.

Note: Damage upgrades or downgrades due to firepower vs. toughness are applied before the shield takes effect. Similarly in case of shield failure during an attack, the damage that penetrates it is again recalculated before it hits the armor.

For example, if a robot is shot by an attack (with a Good firepower weapon) that would cause 5 mortals, this system would convert it into energy and store up 20 points. If struck afterwards for 11 stuns, the capacitors would fill up by another 11 points and would be at 31 shield points of energy. Let's assume that the robot can store up to 40 shield points of damage. If the third attack caused 6 wounds, the shield could store 4 more wounds (up to 39), it would fail on the fifth wound so 2 wounds would pass to the robot's armor or to secondary damage calculations if the robot has no armor. Let's say the robot has an Ordinary-grade armor. These 2 wounds that penetrate the shield are then converted into 2 mortals, since the robot is only of ordinary toughness, and the attack is one of good firepower.

Each round, capacitors bleed off 1 shield point of energy. Thus a full capacitor of 40 points would need about 8 minutes to empty itself.

Displacement Screen (PL 8)

The displacement screen, utilizing gravitonic circuitry, makes the image of the robot to blur, shift and slide, causing the robot's exact position to be indistinct. This provides excellent protection against targeted attacks but does not provide protection against attacks with a blast radius such

as indirect fire heavy weapons. A robot protected by this device gains a +3 resistance modifier bonus to both its Strength and Dexterity. The power requirements are rather high, though.

Stealth Projector (PL 8)

A sheet made of carbon nano-tubes that is applied over the armor, which, in combination with energy dissipation technology, makes a robot practically invisible. It provides a +3 step penalty to all observers attempting to spot the robot. Even if they succeed they will still have a +1 step penalty against all attacks. This system cannot be used in combination with a laser interference system since the laser projectors would give away the robot's position.

4.14. Tools

Tools are what prompted any species to create a robot in the first place. Every robot that was designed for some task has a tool. The definition of a "tool" is subject to debate; a bodyguard robot could need a pistol and a first aid kit, a science robot would use a miniature chemical lab, a harvesting robot needs a pesticide/herbicide/fertilizer sprayer, the examples are as countless as there are tools in existence.

Are there any special tools your robot would require? If so just name them and talk with your GM about how much space do they require. If you followed the process above you already should have a pretty much complete robot with a necessary set of sensors and communication skills, which perhaps only needs a mechanics kit to go and repair things, or a grenade to perform an assassination.

The general rule is: if a system is small then it shouldn't take more than 5% Chassis Points, while if it's a large storage bin on a harvester robot it could take up to 20%. Tools such as gauntlets, medical kits, or even huge solar sails do not need to be integrated inside a robot. They can simply be attached to it, or strapped around robot's chassis or limb. That way they don't require any space and have an independent power supply, usually in a form of a battery. A mining robot may or may not need an integrated ultrasound-drill, which perhaps can be a separate system and usable by hand manipulators. This decision depends on your original concept and primary function of the robot.

A simple screwdriver could take as little as 1 Chassis Point of space, while a big bio-analyzer laboratory would take over 20 Chassis Points. The details are left to GM to decide. Note that specific equipment from various *Arms and Equipment guides* have specific weights listed in their de-

scriptions, and can thus be used in conjunction with the values found under the Storage Space system (see next chapter for details) to help determine the number of CP necessary to integrate the item in question into the robot's chassis. For example, if a radar gauntlet weighs 1.5kg, then it could be stored inside a storage space system at the cost of 3 Chassis Points. Your GM's word is always final, in any case.

At higher Progress Levels the robots reduce the amount of integrated equipment greatly, because they are capable enough to perform several unrelated functions and packing tools for all these functions would be inefficient; if use of tools designed for humanoids is not a problem, then the robot weight can be reduced, power requirements lessened, and finally the cost cut to some acceptable level.

4.15. Miscellaneous

- Exile:** I found a new upgrade part for you.
HK-47: Statement: Something approaching joy is now growing in my behavior core, master. Please install it at once.
HK-47: Cautionary: But please do so carefully. I have seen how you use a hydrosprayer.

There are various systems that don't fall into any of the categories above. These are usually the last to be considered and installed only if there's enough space and power. However, some of these systems can be crucial to the robot's function. Here is a list of only a few example systems, you are more than welcome to design your own special devices for special purposes. Basically any piece of equipment that does not fall under the previous 14 categories is a special part that serves a very specific purpose.

Storage Space (PL 5)

The most rudimentary system of all, it is a container with variable volume that can hold basically anything that fits inside it. A single Chassis Point provides about one cubic decimeter (0.1 meter) of space - enough to store roughly one liter of liquid or one kilogram of standard-density material like iron. Diminutive robots cannot purchase this system.

Security Alarm (PL 5)

This is an alarm device that activates if someone tries to open the robot's chassis or to access it through a socket. It can be rigged to activate a Self-Destruct system in case of a successful hostile entry. If the robot is switched

Table 4.16. Miscellaneous Systems

Type	PL	CP	PP	Cost
Storage Space	5	var.	-	\$50/CP
Security Alarm	5	2	2	\$3K
Self-Destruct	5			
Ordinary		1	1	\$500K
Good		2	2	\$1K
Amazing		3	4	\$10K
Clamps	5	5%.	-	\$100/CP
Key-Code Generator	6	1	1	\$3K
Restraining Bolt	6	1	1	\$500
Holo Projector	7	2	3	\$8K
AI Emulator Program	7	-	-	\$5K

PL: Progress level at which is available.
 CP: Chassis Points required for installation.
 PP: Power Points required to operate.
 Cost: Cost of the system.

off during the moment of perpetration, the Security Alarm can automatically bring it online, depending on what it is programmed to do in such a situation. Programming is very variable - from stopping the actuators, emitting an emergency broadcast signal, engaging combat mode, anything the designer has in mind when installing it. The system can be overridden but provides a +2 penalty to *Security-security devices* complex skill check.

Self-Destruct (PL 5)

This self-termination circuitry is often installed in military robots. The system can perform three basic functions - from simply melting the processor and all of memory storage at Ordinary quality, through additional inciting of a complete cabling and power supply meltdown (treat it as a deliberate Critical Failure on a power boost attempt) at Good quality, to blowing up the power supply, destroying the robot and everyone near it, at Amazing quality. This last option is only possible if the power supply can blow up (see **Chapter 4.2 - Power Supply** for appropriate descriptions). The self-destruct system can be theoretically bypassed or canceled but the system provides +1, +2 or +3 penalty to *Demolitions-disarm*, *Computer Science-hacking* or *Security-security devices* attempts made to break through it, depending on the quality of the system, possibly cumulative with the security alarm system.

Clamps (PL 5)

Robot clamps are used to physically connect a robot with a larger system, usually a storage bin, a large stand-alone propulsion system, or an autonomous tool that the robot either operates or needs to perform a certain function. An example is a mine-laying robot that connects to the mine-storage vehicle and processes mines stored inside. A harvester robot can connect to a large mobile silo in which it will store processed food. A space exploration robot with a system-capable drive may have an autonomous FTL engine that it uses when jumping systems.

Key-code Generator (PL 6)

An illegal device, the key-code generator is capable of generating millions of pass code combinations in real time through a standard keycard interface or similar electronic key system. It provides the robot a -2 step bonus on *Security-security devices* or *Manipulation-lockpick* when trying to unlock an electronically sealed doorway.

Restraining Bolt (PL 6)

A security system that is quite the contrary of the security alarm - it doesn't protect the robot; it inhibits the robot. The system is installed onto the robot's socket adapter, or directly fused to its processor pathways. This system contains a small nanocomputer with very specific instructions or sets of orders that the robot cannot disobey. Usually the first one is an equivalent of "Do not remove or allow removal of this device." Other orders can go from demanding obedience to a specific person or group to preventing generation of rogue programs, that robots are sometimes capable of doing and which can cause the robot to run away. This system can be patched to a self-destruct system, and cause massive trouble for a would-be independent robot.

Holo Projector (PL 7)

This system uses a series of lasers, gravitic deflectors and resonance projectors to create a 3D image in clear and still space. The image is clear enough to discern details but cannot fool anyone into believing it's an actual object.

A robot can use this system to project an image up to 3 meters away.

AI Emulator Program (PL 7)

This is not a hardware system but a very sophisticated piece of software that is custom designed for each robot that has it, according to its functions and abilities. It features personality chipset enhancement procedures, aggressive troubleshooting and problem solving algorithms, fine-tune enhancements and reasoning optimizations. This software does not make the robot truly sentient, it just emulates the way a sentient would think and act. Once installed it cannot be removed from active memory (without a complete memory wipe), and requires 4 active memory slots to run. However it provides a -1 step bonus to any other program a robot would run, and that includes skills which are ultimately programs. Note that if a robot tries to use a broad skill that it's not programmed with or specialty skill it doesn't have ranks in, or perform a feat check, it will not receive this bonus.

Note: There is one other relatively important detail concerning this piece of software - by installing it the robot may be crossing the fine line from an automaton to a real persona (even if an emulated one), depending on the society and their position on this matter.

5. STATISTICS

Morte: Hey Nordom, knock-knock.

Nordom: Why do you persist in addressing me as a door?

Morte: It's a joke, you stupid polygon! You're supposed to answer "Who's there?"

Nordom: I know who is there. It is you. Why would I ask a question when I already know the answer?

Morte: Just forget it.

This chapter deals with statistics - all the numbers that a robot needs on the character sheet, and their consequences. By picking the same systems in the previous chapter it is quite possible to have two identical robots, but each of these robots may have very different statistics making them quite unique. Hopefully you have already envisioned what attribute scores a robot would have or need. In that case this chapter will be your guide through number crunching, and after all the work here is done you should have a complete and usable robot, ready to go on a grand adventure, or at least to throw out the trash!

5.1. Profession

Each robot chooses a profession according to its primary function. A military robot is an obvious example of a Combat Spec. Other examples might include, but not be limited to: a medical robot could be a Tech-Op; a protocol robot can be a Diplomat with a secondary category according to its secondary function (bodyguard - Combat Spec, spy - Free Agent, administrator - Tech-Op); an exploration robot can easily fit the Free Agent profession.

The professions carry similar, if not all the same advantages a biological hero would gain - skill cost reduction in relevant skills, action check modifier increases and special profession bonuses: weapon specialization for Combat Specs, increased learning curve for Tech Ops, higher resistance modifier for Free Agents and a possible contact for a Diplomat robot (possibly its owner or its owner's contact, or even its own contact if the robot is emancipated). A Mindwalker robot is not possible until PL9, and even then only with a positronic brain. Such a robot is handled through the same mechanism as a biological hero.

The only notable difference is the Free Agent handling of Last Resort points, which robots do not have at all. Instead the Free Agent robots gain an additional resistance modifier increase to one score. For example, a Free Agent robot with a DEX score of 9 (0 resistance modifier) could put both its increases here to gain a +2 resistance modifier to ranged attacks. This number can be further regulated with perks/flaws, just like a biological hero.

Also keep in mind that the standard *PHB* requirements for these professions still apply. See **Table P1: Profession Requirements** in *PHB*, page 30, to help you during planning.

From this table it's easy to recognize some inherent restrictions - it is impossible for a robot to be a Diplomat until PL8 (and only then with an Amazing-quality processor). A Free Agent robot will not appear until PL7, but a Tech Op is feasible at PL6 (with the help of Amazing-quality processor). Also, very small robots cannot be Combat Specs because of their CON and STR requirements. A PL5 robot can safely be a Combat Spec.

"Profession Unleashed" Alternative Rule: If you find a certain profession doesn't suit the robot at all (a PL5 harvesting robot fitting only Combat Spec requirements), remember that it is possible (via this rule) to build a robot with

an unsupported profession. A PL5 robot can be a Tech Op, but in that case it won't gain the special Tech Op benefits of advanced learning curve and the action score increase. This goes for all professions - they can still provide a robot with the skill price reduction but will not provide any other profession benefits.

Reason itself will sort the other issues - a PL5 robot with maximum WIL and PER scores will still be a terrible, terrible Diplomat. It can't even buy intelligence-based specialty skills or will- or personality-based broad skills, as described in **Chapter 5.5 - Skills**. Being a Tech Op or Diplomat simply makes no sense since there are no skills to be bought. A PL6 robot will not be a much better Diplomat either, as it can't buy will- or personality-based specialty skills, though it could be a relatively good Tech Op. If a player wants to play a robot Diplomat in PL5 or PL6 the GM should urge that the player takes a biological hero and not a robot.

5.2. Attributes

There are six attribute scores that every creature has, and a robot is no different. These are strength, dexterity, constitution, intelligence, will and personality. If you followed the tables in the previous chapters, you have noticed that there are two basic systems that define attributes in a robot, with size as a catalyst. Namely:

- Processors define maximum intelligence, will and personality scores.

- Actuators provide strength and dexterity ranges.

- Size directly defines constitution range and gives some limits on maximum strength and dexterity.

Once the exact ranges are defined the robot receives 60 attribute points to distribute among them. 60 attribute points are a standard for a robot hero. A supporting cast robot can have this number vastly reduced or enlarged, depending on its function and needs. Such robots cannot be played as heroes due to the massive game-play imbalance they would cause.

If, for some reason, a robot hero is constructed that cannot spend all of the 60 points even if it picked all maximum attributes available, then all the maximums must be selected and the rest of attribute points can be 'cashed in' as skill points at a 1 AP = 1 SP ratio. This is a very bad ratio for a reason - selling attribute points for skill points is a bad practice as the robot hero would be very underpowered compared to other heroes. The player should rather rethink the robot design and select some other systems that would allow distribution of all attribute points. Most PL5 robots, if not all, will not be able to spend the entire 60 attribute point pool. That is one of the main reasons why a player should never pick a PL5 robot for a hero.

A minimum score for an attribute that has only a maximum defined (like intelligence) is always 1, except when designing robot heroes. Heroes always have a minimum score of 3 and cannot go below that voluntarily. It is theoretically

possible for a robot to have intelligence, will and personality scores equal to zero, but by Alternity robot definition such a machine would not be a robot. It would be a mindless tool with no adaptive intelligence, no experience-learning method and no interaction skills, respectively. Will score equal to zero would prevent the machine from ever gaining any levels. Thus, as stated before, minimum scores for robots are 1 and for robot heroes are 3.

Example of attribute distribution: A small PL7 robot hero with a Good quality PL7 processor and micro-ligament actuators would have these ranges to choose from:

3-14 INT, 3-9 WIL and 3-7 PER provided by the processor.

The actuators would give these ranges: 4-10 STR, 8-14 DEX.

Size would limit maximum strength and dexterity to 12 and 16 respectively, meaning the previous ranges are viable and need not be corrected.

If the robot had hydraulic actuators that provide 12-18 strength range, then the STR range would become 12-12, meaning a fixed strength of 12.

The small robot hero's designer has decided to go for more space and less durability and has chosen the constitution score of 7. With all the ranges in place for all six attributes, this is one of many possible attribute distributions: STR - 9, DEX - 14, CON - 7, INT - 14, WIL - 9, PER - 7, spending all 60 points and creating a fairly dexterous small robot with an attitude and natural proficiency at all intellectual tasks, possibly a Tech Op-to-be. It even has enough personality not to speak in beeps and whistles but can form sentences.

Another example of attribute distribution: A diminutive PL7 robot (not eligible to be a hero!) with an Ordinary quality PL6 processor and no actuators whatsoever. To make this example realistic, the robot has a gravitic propulsion system, and a single laser torch mounted in the chassis. Its function is to locate a broken part of a ship's hull and weld it.

Its processor allows it these ranges: 1-9 INT, 1-6 WIL, 1-4 PER.

Since it has no actuators it uses the propulsion values - maximum strength 8 and maximum dexterity 12.

Its size carries the following ranges: 1-8 STR, 1-18 DEX and 3-6 CON.

So, effective ranges are: 1-8 STR, 1-12 DEX, 3-6 CON, 1-9 INT, 1-6 WIL and 1-4 PER. A reasonable attribute distribution would be: STR - 5, DEX - 12, CON - 4, INT - 8, WIL - 1 and PER - 1. This robot is not designed to interact with people in any way; it simply performs its function of welding broken hull plates. It has 31 attribute points distributed, which is an optimal amount for this function. Because it lacks actuators it cannot handle any objects. However, it may use its propulsion engine to perhaps push an object, and its effective strength in such a case would be 5. Since this robot is not a hero it cannot cash in the extra attribute points for skill points as only heroes have 60 attribute points to start with.

5.3. Perks

There are many ways to make a robot unique or to allow it to go beyond what is normal for a robot of its model. These

perks listed below are either special systems, programs or tweaks that would be very hard and/or expensive to integrate with other systems, yet may be necessary for a robot to purchase in order to carry out its function. Most of the Perks listed below closely mirror those described in the *PHB*, but some have different requirements, carry tweaked mechanics or have a hidden catch. As with a biological hero, a robot is limited to only 3 perks.

Celebrity (PL 5)

Cost 3, PER, Conscious

Consult *PHB* page 104. A Robot can easily become a celebrity even at PL 5, if it has performed some heroic task or has become widely popular through a movie or some other method of propaganda. If the robot isn't aware of its recognition and status (because of the low PL and lacking behavioral cores) it won't mean much to the robot.

Concentration (PL 5)

Cost 3, INT, Conscious

Consult *PHB* page 104. Instead of concentrating like a human would, a robot is capable of performing a quick prediction check even if not programmed to do it. As in the *PHB* description, if disturbed, the parameters are no longer the same and the check fails.

Excellent Design (PL 5)

Cost 6, CON, Active

The robot's design is at peak efficiency due to fine craftsmanship and ingenuity. It allows the robot to receive 5% extra Chassis Points for free - these points are literally bonus points that can be filled with anything the robot needs. These extra points cannot be distributed to limbs.

Exceptional Design (PL 5)

Cost 10, CON, Active

The robot has a prototype chassis that can hold up to 10% more systems than before - the robot receives the extra 10% Chassis Points for free and these can be filled with any systems. The only restriction is that these points cannot be distributed to limb space.

Fortitude (PL 5)

Cost 4, CON, Active

Consult *PHB* page 105. The robot's cabling is a piece of art; it's easier for the robot to unplug, isolate or bypass damaged systems.

Good Luck (PL 5)

Cost 3, WIL, Conscious

Consult *PHB* page 105. The universe looks kindly on the robot and for no apparent reason it sometimes succeeds where others fail.

Heightened Ability (PL 5)

Cost 10, Special, Active

Consult *PHB* page 105. The robot designer was a genius when it came to engineering and has made special improvements to one of the robot's attribute-defining systems. It is still not possible to go beyond system limits, but is possible to go beyond size-defined maximum strength, dexterity and constitution. In the case of increasing constitution be sure to recalculate new chassis points - the formula is still valid even if the CON range is out of predefined limits.

Table 5.1. Perks

Perk	PL	Cost	Ability	Type
Celebrity	5	3	PER	Conscious
Concentration	5	3	INT	Conscious
Excellent Design	5	6	CON	Active
Exceptional Design	5	10	CON	Active
Fortitude	5	4	CON	Active
Good Luck	5	3	WIL	Conscious
Heightened Ability	5	10	Special	Active
Hidden System	5	4	DEX	Conscious
Observant	5	3	WIL	Active
Redundant Systems	5	6	CON	Active
Reflexes	5	4	DEX	Active
Reputation	5	3	WIL	Active
Remote Backups	5	5	INT	Active
Superior Tech	5	5	CON	Active
Tough as Nails	5	4	STR	Active
Vigor	5	2/3/4	CON	Active
Detachable System	6	3	CON	Conscious
Hardened Casing	6	4	CON	Active
Popular Model	6	2	CON	Active
Self-Editing OS Module	6	4	INT	Conscious
Alien Artifact	7	8	-	Special
Emancipated	7	5	PER	Active
Faith	7	5	WIL	Conscious
Filthy Rich	7	5	WIL	Conscious
Fuzzy Logic	7	4	PER	Conscious
Nanite Self-repair	7	4/7/10	CON	Active
Powerful Ally	7	4	PER	Conscious
Willpower	7	4	WIL	Active
Great Looks	8	3	PER	Active
Language Module	8	6	PER	Conscious
Memory Implants	8	4	PER	Active

PL: Progress Level at which is available.

Cost: Cost to purchase the perk in Skill Points.

Ability: Relevant ability to the perk.

Type: Perk is either active all the time or needs to be consciously engaged.

Hidden System (PL 5)

Cost 4, DEX, Conscious

A single item or a system itself has been hidden inside the robot's chassis or limbs, out of sight and shielded from scanners. The robot can deploy the item or activate the system in one phase. If a separate item is the focus of this perk, then it needs to be located inside a storage space system which itself is instead now considered the focus of this perk, and cannot be larger than 5% of the robot's Chassis Points in order to remain hidden. The same restriction goes for any system (ranging from scanners to integrated weapons) - it cannot go over 5% of the robot's maximum Chassis Points. Note that normal integrated weaponry, while retractable into the robot when not in use can easily be detected by weapon scanners.

Observant (PL 5)

Cost 3, WIL, Active

Consult *PHB* page 105. The robot's sensors are incredibly efficient and the processor handles their input much faster than normal. This perk does not allow more sensors to be handled than normally possible, only enhances the results.

Redundant Systems (PL 5)

Cost 6, CON, Active

The robot has redundant actuators, memory buffers, extra energy capacitors and is more reliable overall. These extra systems do not require any additional space but do need

one active memory slot to be regulated. The effect is that a robot does not suffer knockout checks from stun damage and cannot be dazed. Wound damage may still stun the robot but it makes *Stamina-endurance* checks with a -3 step bonus.

Reflexes (PL 5)

Cost 4, DEX, Active

Consult *PHB* page 106. The robot's designer made the robot more flexible and/or responsive than usual and upgraded it with special battle-logic circuitry.

Reputation (PL 5)

Cost 3, WIL, Active

Consult *PHB* page 106. The robot is widely known for some reason; perhaps it's a very successful Robot-Cop or a veteran war-general of the future. This reputation history needs to be discussed with the GM.

Remote Backups (PL 5)

Cost 5, INT, Active

The robot can store its memory core onto another mainframe like a ship's computer core or some government AI mainframe. It can also retrieve these backups when needed. If the robot is completely destroyed, someone can download these memories into a new robot body and the robot would again be fully functional with all the memories in place minus the last few days that it took to purchase or construct a replacement body.

Superior Tech (PL 5)

Cost 5, CON, Active

The robot was built with or had later installed a prototype or an advanced system that hasn't reached the mainstream markets. One system may be chosen that is one PL higher than normal during robot creation. This system can be virtually anything, from an advanced processor to prototype actuators. When calculating the overall price of the robot remember that a prototype system costs triple its listed price due to yet undeveloped mass-production system and sheer man-hour effort put into inventing and producing it. This perk only provides access to such technology, it doesn't pay for it.

If this system is destroyed and the robot is unable to replace it easily, the robot may lose this perk. It may be quite an adventure to find the replacement system. A damaged system can be temporarily fixed with a Technical Science-*juryrig*, Technical Science-*repair* or Technical Science-*robotics* skill but the next direct damage the system suffers will destroy it completely. Even the Nanite Self-Repair perk cannot allow this system to be rebuilt from scratch, but can repair it fully if damaged.

Tough as Nails (PL 5)

Cost 4, STR, Active

Consult *PHB* page 106. The robot has a very compact and sturdy chassis form allowing it to resist impacts easier than normal.

Vigor (PL 5)

Cost 2/3/4, CON, Active

Consult *PHB* page 106. The robot's chassis has special design improvements that allow it to suffer more damage than normal. This doesn't affect the number of Chassis Points available.

Detachable System (PL 6)

Cost 3, CON, Conscious

The robot features a specially designed sensor, tool, system, or an entire limb that can be detached and can function for some time independently. The robot still needs to control this system's actions via a wireless data port. Each time the robot takes this perk it applies to another system or limb. The GM should be ready to impose reasonable limits - a detachable limb with an integrated laser pistol that was previously connected to the robot's power supply cannot fire the weapon: the laser doesn't have a power supply any longer. Even if the limb is capable of firing a weapon it can only do so in one direction - it cannot turn itself around on its own.

Hardened Casing (PL 6)

Cost 4, CON, Active

The robot has been through a lot. Its armor has long since been ideally optimized and is more efficient than a new one. Increase all of the armor ratings (Li/Hi/En) by one point. If the robot replaces its armor with a new one, it loses this perk.

Popular Model (PL 6)

Cost 2, CON, Active

This robot uses a very popular chassis, one that is widely renowned. It makes the robot reasonably anonymous due to the large number of robots looking exactly like it, and every robot part shop has a 50% higher chance of having reserve parts for this robot. Since the components are

widely used, the repair crews are familiar with them and receive a -1 step bonus on Technical Science-*repair* and Technical Science-*robotics* complex skill checks when performing maintenance, repair or upgrades on the robot.

Self-editing OS Module (PL 6)

Cost 4, INT, Conscious

This software is an integral part of the robot's OS and doesn't require any additional memory space. It allows the robot's OS to change its own programming rapidly. The module allows the robot to dump a broad skill (and all associated specialty skills) for a new broad skill. The robot must shut down and reboot in order for the change to take effect. Also, the robot must previously spend some time observing the desired broad skill: it takes one day of observing per skill point necessary to learn the skill. While irrevocably jettisoning an entire aspect of the robot's skill set may seem a high price to pay, it is somewhat lessened when used together with the Remote Backups perk (which restores the robot to previous status), and can be quite useful if the robot doesn't possess a vital skill needed for some important task.

Alien Artifact (PL 7)

Cost 8, -, Special

Consult *PHB* page 103. The question of ownership of the Alien Artifact must first be settled, so a robot must have the Emancipated perk before being allowed access to the Alien Artifact perk. Also, a GM is suggested to re-roll the Alien Artifact as many times as necessary until an item, special software, system, or anything applicable is rolled. The GM can add his own systems to the list of ones in the *Gamemaster Guide*.

Emancipated (PL 7)

Cost 5, PER, Active

A very useful perk, it is recommended for all PL7 and higher robot heroes. An emancipated robot is no longer someone's property but is considered to be a free sentient (or pseudo-sentient if it has an AI emulator software) that is able to conduct affairs within the full protection of the law. The robot is able to own a bank account and other assets, conduct business and is also responsible for its actions. Note that some societies consider robots to be tools no matter their mental and legal status, and this may create problems for a robot entrepreneur. With this perk the robot is also freed from any restraining bolt and doesn't have to listen to orders any more than a normal person needs to obey laws or listen to his employer.

There are two ways for the robot to gain this perk. It can develop rogue programming that overcomes its obedience parameters or it can be freed by its owner. Since all robots feature self-learning algorithms that improve its skills over time, the robot of 6th level or above can produce the rogue programming (which costs 5 skill points and provides this perk), but a restraining bolt will interfere with this process and deny any such programming to take effect. Once gone rogue, the robot cannot be brought under previous control even with the restraining bolt, so they need to have their memory wiped of all programming, effectively resetting them to factory defaults.

Other owners may in time free their robots, and such freed robots, if lacking ambition, often continue to serve their previous masters. Even another player or an AI system can emancipate the robot but the robot still needs to spend the SP requirement. Until it does the robot's programming will remain loyal to its owner and the law will not recognize the robot's new status.

Faith (PL 7)

Cost 5, WIL, Conscious

Consult *PHB* page 104. The robot's faith (in something) is very easily explained through the inherent programming. Though a belief system is not rational by default, a simple programming loop can cover this deficiency and make the robot believe in something.

Filthy Rich (PL 7)

Cost 5, WIL, Conscious

Consult *PHB* page 104. In order for a robot to possess any funds it needs to be emancipated before picking this perk. Instead of a family, the robot's funds came from a smart investment, a large donation or some other reasonable source.

Fuzzy Logic (PL 7)

Cost 4, PER, Conscious

Any robot that is not fitted with Honesty Regulators can lie, but they usually do it badly. Fuzzy Logic helps the robot in this attempt, providing a -1 bonus on verbal *Deception-bluff* attempts. It also alleviates the need for the robot to obey badly phrased orders. If intelligent enough, the robot can twist the meaning of any order, though it still cannot disobey a strict, straight order coming from its owner or an authorized user.

Nanite Self-Repair (PL 7)

Cost 4/7/10, CON, Active

This system allows the robot to repair itself without outside assistance, and even without full knowledge of its own internal circuitry and mechanics, as long as the robot has access to raw materials. The nanobots are programmed to repair only the robot possessing this system, and the Nanite Self-Repair system contains all knowledge necessary to repair the robot.

When purchased at the 4 SP level the nanobots can repair wounds. It takes 6 hours to successfully repair one wound, and \$100 worth of materials. Mortal points will have to be repaired by a technician or by the robot itself. If the robot tries to operate on itself it suffers a +3 penalty to its Technical Science-*robotics* skill.

When purchased at 7 SP level the nanobots can also repair mortal damage at rate of one mortal point per 24 hours. It takes \$250 worth of materials to repair a single mortal point.

When purchased at the 10 SP level the nanobots can build from scratch an entire system destroyed by theft, vandalism or special damage. It takes 72 hours to rebuild a system from what's left of it, and the cost is three quarters of what a new system costs. A prototype system that is acquired through Superior Tech perk cannot be built from scratch, at least until it hits the mainstream markets and the schematics become widely available.

Powerful Ally (PL 7)

Cost 4, PER, Conscious

Consult *PHB* page 105. Since a robot that is someone's property could never have an independent ally of its own choosing, the robot needs to pick the Emancipated perk before picking this one.

Willpower (PL 7)

Cost 4, WIL, Active

Consult *PHB* page 107. A robot with this system has a spe-

cially designed OS with internal security algorithms that provide the robot with more protection against hacking, and easier detection of lies.

Great Looks (PL 8)

Cost 3, PER, Active

Consult *PHB* page 105. The robot needs to have biological or synthetic tissue actuators, skin, and biological or synthetic tissue sensors; in other words, it needs to resemble a humanoid as much as possible for this perk to have effect. This perk never has any influence when interacting with another robot or AI.

Language Module (PL 8)

Cost 6, PER, Conscious

The robot has special hardware that is programmed with all known languages, together with hundreds or thousands of different dialects. For all effects and purposes the robot can speak any known language perfectly, though specific language-based phrases and subtle wording might not be incorporated into this programming. The cost of learning new languages is lowered to 1 SP per language due to incorporated pattern-matching algorithms that easily reconstruct the language matrix. It takes one action to switch from one language to another.

Memory Implants (PL 8)

Cost 4, PER, Active

The robot has false memories of its childhood, adolescence and young adulthood, allowing it to exhibit greater emotional depth and empathy than normal. The robot's personality attribute score is increased by 2, which may exceed the processor's limit. If the robot ever discovers these memories are false it must succeed a will feat check or permanently lose 1 point of personality. If the robot has memories of human childhood then it must resemble a human, of course, through biological or synthetic tissue actuators, skin, bones and other systems that humans have. At the end of PL8 it may be possible for a human to transfer its consciousness into a robot body, and the memory implants can be founded on this assumption. The robot also needs to be either emancipated or have a real AI installed.

5.4. Flaws

Any robot may have unexpected problems as a result of a bad design, manufacturing problems, or a deliberate decision. These flaws add greatly to the game-play value of the robot hero though they can be very dangerous for both the robot and its companions. Most of them are compatible with *PHB* flaws; any differences being specifically noted. Just as with perks, the robot may have 3 flaws at most. A robot may choose to buy off the flaw in the future (during gameplay), but at double the Skill Point cost.

Bad Luck (PL 5)

Cost +6, WIL

Consult *PHB* page 107. The universe simply doesn't like the robot.

Clumsy (PL 5)

Cost +6, WIL

Consult *PHB* page 107. Very often a trait of early PL5 robots, it is still common among the robots that do not need as much manual precision as pure strength.

Table 5.2. Flaws

Flaw	PL	+SP	Ability
Bad Luck	5	+6	WIL
Clumsy	5	+6	WIL
Delicate	5	+3	STR
Feeble Design	5	+10	CON
Fragile	5	+3	CON
Frail Chassis	5	+6	CON
Inadequate Design	5	+6	CON
Incomplete Coding	5	+2/4	INT
Inferior Tech	5	+4	CON
Memory Lapse	5	+5	INT
Oblivious	5	+4	WIL
Old Injury	5	+2/4/6	STR
Overheat	5	+6	CON
Secret Orders	5	+3	WIL
Short Circuit	5	+4	INT
Slow	5	+6	DEX
Unarmored	5	+2	CON
Clueless	6	+2/4/6	INT
Doublespeak	6	+2	PER
Honesty Regulators	6	+2	PER
Obsessed	6	+2/4/6	INT
Primitive Robot	6	+6/+10	CON
Alien Artifact	7	+5	-
Asimov Circuits	7	+3	WIL
Command Circuitry	7	+4	WIL
Dirt Poor	7	+5	PER
Infamy	7	+2/4/6	PER
Phobia	7	+2/4/6	WIL
Powerful Enemy	7	+2/4/6	PER
Spineless	7	+2/4/6	WIL
Temper	7	+2/4/6	WIL
Erratic Intelligence	8	+4	PER
Poor Looks	8	+3	PER

PL: Progress Level at which is available.
 +SP: Bonus Skill Points gained from purchasing the flaw.
 Ability: Relevant ability to the flaw.

Delicate (PL 5)

Cost +3, STR

Consult *PHB* page 108. This flaw is very common, almost without exception, in small, tiny, and diminutive robots. They are never designed for melee combat and designers often overlook the question of integral endurance.

Feeble Design (PL 5)

Cost +10, CON

The robot's systems are organized poorly; the cabling is inefficient and distributed haphazardly throughout the chassis. As a result the robot loses 15% of its Chassis Points. Note that this does not alter the size requirements of its actuators or any other systems which are calculated as a percentage of the robot's total chassis points; these values are still based upon the original, unaltered chassis point value. The cabling issues cause a +1 step penalty on all Stamina-*endurance* skill checks.

Fragile (PL 5)

Cost +3, CON

Consult *PHB* page 108. Robots that are designed for specific precision tasks in controlled environments like medical or scientific labs are rarely as sturdy as robots designed for everyday outdoor use. This flaw is quite common in such robots.

Frail Chassis (PL 5)

Cost +6, CON

The robot's chassis is made of low-quality and brittle material, making the robot very vulnerable to any kind of physical violence and stress. Its armor rating is considered to be one grade lower - if it had heavy neutronite armor which is an armor of Good-quality toughness, it would be downgraded to Ordinary-toughness instead. Ordinary-quality toughness armor would degrade to Marginal-toughness armor, etc.

Inadequate Design (PL 5)

Cost +6, CON

Thanks to the efforts of an incompetent design team, the robot's chassis doesn't take full advantage of its size. The robot loses 10% of its Chassis Points. Note that this does not alter the size requirements of its actuators or any other systems which are calculated as a percentage of the robot's total chassis points; these values are still based upon the original, unaltered chassis point value.

Incomplete Coding (PL 5)

Cost +2/4, INT

A robot which was never fully finished, or with bad and incomplete programming might feature this flaw. It occasionally fails to understand or misinterprets the orders given to it, wasting time requesting further instructions, or simply gets 'stuck' in a loop and fails to respond to an order.

+2 SP: On a Marginal result while attempting an action the robot stops to request further instructions, wasting an action in the process. Assuming it does get the input it can try again in the next action. On a Critical Failure the robot gets stuck in a loop and is unable to accept any further instructions or perform any actions until the situation is resolved. The robot may break out of the programming loop with a successful WIL feat check, recognizing the loop as an infinite one and killing the process, or another character may attempt a Technical Science-*robotics* skill check to kill the process himself.

+4 SP: On a Marginal result while attempting an action the robot misinterprets the order and executes an incorrect but harmless action - trying to repair a weapon when instructed to fire it. The player should write down these decisions as they are hard coded and cannot be changed until someone rewrites the faulty code with complex Computer Science-*programming* skill check. On a Critical Failure the robot performs a dangerous incorrect action; firing the weapon when instructed to repair it for example.

Inferior Tech (PL 5)

Cost +4, CON

The robot is constructed of used, old, or faulty systems, which degrade its performance. As a result the robot suffers Fatigue damage just like any other hero does, plus extra Fatigue damage when its batteries run low. The robot gains a Fatigue rating dependent on its constitution score (half rounded up), just as if it were a biological person. A Critical Failure on any STR, DEX or CON related skill will give the robot a fatigue point in addition of failing the task, plus an extra fatigue point for every half an hour the robot is under 10% of its battery capacity.

Memory Lapse (PL 5)

Cost +5, INT

There is a hole in some of the robot's memory circuits and the robot often forgets important events and data such as names, passwords or even instructions for operating complex tools. As a result the robot receives a +1 step penalty

on all intelligence-based skill checks.

Oblivious (PL 5)

Cost +4, WIL

Consult *PHB* page 108. The robot has major problems with sensor calibration and the processing of sensory data. This flaw doesn't affect the number of sensors a robot can process simultaneously.

Old Injury (PL 5)

Cost +2/4/6, STR

Consult *PHB* page 108. The old injury may be in a form of a badly patched actuator, half-burned but irreplaceable piece of cabling or any other system that isn't trivially replaceable or repairable. Talk with your GM on what system would be affected and what would cause it to malfunction.

Overheat (PL 5)

Cost +6, CON

The robot's cooling system is malfunctioning or missing altogether. As a result its processor and actuators run very hot, often leading to problems. When facing a situation that would cause a humanoid to gain a fatigue point, the robot needs to make a Stamina-*endurance* check. If it succeeds, nothing happens and the robot continues to function normally. On a failure the system overheats and the robot must shut down immediately to cool off or risk complete meltdown. On a Critical Failure something caught fire and massive damage is caused.

Secret Orders (PL 5)

Cost +3, WIL

The robot with this flaw must have either a wireless or a telepresence link. Deep inside one of the robot's circuits, untraceable by normal means, exists a hidden set of orders that may include assassination targets, spying missions or plans to some vital installation. The GM decides what the secret orders are and when it is an appropriate situation for these orders to activate. Furthermore, a robot may receive a signal from its wireless or telepresence link, updating these orders, without even realizing what is happening or being aware of the existence of these orders at all. These orders override every other attempt to control the robot - restraining bolts, the Asimov Circuitry flaw, the Honesty Regulators flaw and normal orders to an unemancipated robot.

Short Circuit (PL 5)

Cost +4, INT

An untraceable short circuit exists somewhere in the robot's main circuitry and under normal circumstances no amount of scanning can locate it. Whenever the robot makes a Critical Failure, the short circuit flares, dealing 2 points of Stun damage to the robot, in addition to causing it to fail the task it was attempting to perform. Only a total system replacement of the robot's circuitry could fix this issue (treat it as buying off the flaw), but until then almost anything else can set off the short circuit, at the GM's discretion—from Amazing hits against the robot to failed Stamina-*endurance* checks. The robot also suffers a 50% increased battery or power generator consumption rate with no bonus in Power Points received from the power supply.

Slow (PL 5)

Cost +6, Dex

Consult *PHB* page 109. Very common among the robots of earlier progress levels, their designers were painfully aware

of the slow robot reaction rates. Seeing there was nothing possible to do to fix this, the engineers often traded what little reaction speeds those robots had for other things.

Unarmored (PL 5)

Cost +2, CON

The robot doesn't even have a standard casing to protect it from dust, dirt, or rain, nor can support any armor due to lack of attachment points which hold the armor to the chassis. These attachment points can be bought and installed, but treat it as buying off this flaw. The robot suffers full damage in combat, varying step penalties when facing sand or electrical storms, cannot ever be submerged in water, and cannot take the Hidden System perk.

Clueless (PL 6)

Cost +2/4/6, INT

Consult *PHB* page 107. The processor has a flaw that makes it unable to efficiently perform a certain skill, without the robot's OS realizing this flaw exists.

Doublespeak (PL 6)

Cost +2, PER

The robot is programmed to confirm acceptance of an order by repeating the order or a related phrase. On a Critical Failure while performing an order the robot may stutter uncontrollably and be stuck in a loop until the system restores itself (with a successful WIL feat check). In addition, the robot gains a +1 step penalty on all personality checks and feats.

Honesty Regulators (PL 6)

Cost +2, PER

The robot has a modified version of a restraining bolt which takes practically no space and doesn't require a power supply. The honesty regulators forbid the robot to tell a lie, and forces it to answer the truth to any question posed to it. The robot must succeed a WIL feat check to ignore the question rather than answer the truth but on a Critical Failure the honesty regulators overload the processor with enough stun points to knock out the robot until the end of the scene.

Obsessed (PL 6)

Cost +2/4/6, INT

Consult *PHB* page 108. The robot has inflexible primary function programming that sometimes presents a real multitasking problem, which the robot isn't prepared to handle.

Primitive Robot (PL 6)

Cost +6/10, CON

The robot is constructed entirely of out-dated (at least one PL old) systems. Whether it's a relic of a bygone age, a veteran fighter, or perhaps a new robot which is a reconstruction of some antique model, this is a serious disadvantage. If the robot is constructed of one PL older parts it receives +6 SP, while if it is two PLs old (a PL6 robot in PL8 age), it receives +10 SP to compensate.

Alien Artifact (PL 7)

Cost +5, -

Consult *PHB* page 107. The question of ownership of the artifact must be solved, so only emancipated robots may take this flaw. The *Gamemaster Guide* has specific rules how to generate Alien Artifacts, and the GM should

be aware that the list presented there may be enhanced when generating a robot's Alien Artifact - different systems, software, or even programming viruses may be generated in addition to all that's applicable to robot heroes from the *Gamemaster Guide*.

Asimov Circuits (PL 7)

Cost +3, WIL

The robot must follow the three Laws of Robotics set by Isaac Asimov:

1. A robot may not harm a human being, or, through inaction, allow a human being to come to harm.
2. A robot must obey the orders given to it by a human being, except where such orders would conflict with the First Law.
3. A robot must protect its own existence, as long as such protection does not conflict with the First or Second Laws.

While noble in principle, these laws are inherently flawed since, for example, a robot following them couldn't surgically operate a human in order to save his life - it would be harming the human by using standard surgical tools on him. Also, the robot hero would undoubtedly disagree, argue and even oppose its companions on more than one occasion, especially if a dangerous plan needs to be executed where anyone (including the opposition) could come to harm.

Command Circuitry (PL 7)

Cost +4, WIL

The robot hero has a telepresence link that can be used by anyone in possession of the operating frequency and the passcode. Such a person could take complete control over the robot, and the robot could not disobey any orders which are not self-destructive. If the robot receives more than one order through its telepresence link, it always follows the most recent order first, but does not forget the previous orders until they are specifically canceled. These circuits are always found on industrial and other production robots and allow the supervisor or AI to keep the robot's operation at peak efficiency. A military grade robot never has this circuitry as it would compromise its security and its orders. This flaw can only be picked by robot heroes.

Dirt Poor (PL 7)

Cost +5, PER

Consult *PHB* page 108. All new robots are dirt poor but that's not a problem if they are bought by a person who can provide necessary maintenance. However, if a robot is

emancipated, this flaw can be very important, and thus can only be purchased by a robot with the Emancipated perk.

Infamy (PL 7)

Cost +2/4/6, PER

Consult *PHB* page 108. The robot is perhaps a rogue one, and has murdered its owner, or was a tool in some large criminal activity. Talk with your GM for the possible reasons for this infamy.

Phobia (PL 7)

Cost +2/4/6, WIL

Consult *PHB* page 108. The robot's self-preservation programming is rather buggy. This could result in an almost human-like irrational fear of rain, dust, power or data sockets or any other source of potential threat to a robot.

Powerful Enemy (PL 7)

Cost +2/4/6, PER

Consult *PHB* page 109. For a robot to gain a Powerful Enemy flaw, it must be responsible for its own actions, meaning it must purchase the Emancipated perk. The robot may have committed a deed that put local authorities on its tail or may be a prototype gone rogue that its previous owner wants back badly. It is up to the player and GM to decide this part of the robot's history.

Spineless (PL 7)

Cost +2/4/6, WIL

Consult *PHB* page 109. The robot's programming is very susceptible to outside influence as the robot constantly seeks out directions. It makes the robot less autonomous in the long run, and possibly unreliable.

Temper (PL 7)

Cost +2/4/6, WIL

Consult *PHB* page 109. The robot has a difficult behavioral core. This problem can be especially dangerous on a military robot—who knows what could cause it to perceive someone a threat, and what it can do when its "buttons are pushed".

Erratic Intelligence (PL 8)

Cost +4, PER

The good news is that the robot receives an AI board plus the AI itself for free. The bad news is that the AI is insane. It may refuse to carry out orders, or can be downright paranoid, psychotic, or even homicidal. The details of the madness are left to GM to decide. This flaw cannot be picked



Robot Guardian, *Judge Dredd*, 1995. An obsolete PL6 warrior robot with a bad Temper flaw.

by a robot hero. A robot villain though, is a different thing entirely.

Poor Looks (PL 8)

Cost +3, PER

Consult PHB page 109. The robot must be made of biological or synthetic tissue actuators, and have all the necessary systems like skin and humanoid sensors to make it appear humanoid. Unfortunately, instead of looking normal it looks akin to a Frankenstein's monster.

5.5. Skills

Having defined attributes and profession, the choice of skills is usually easy to make. A robot learns as a biological hero would, and at the same rate; so the cost for most skills is approximately the same. This is true for all physical-based skills. However, there are some differences between biological and robot comprehension methods. A robot will learn intelligence-based skills faster than a biological hero would, while will-based and especially personality-based skills will be increasingly harder to understand. This reflects on their respective cost and some innate and non-removable step penalties in those areas.

Some specialty skills (and even broad skills) do not exist for a robot. Such an example is the entire Resolve skill set tree. A robot has no resolve; its programming will force it either to do or not to do a task. Even AIs at PL8 will not receive this tree. Of other interest are the Awareness-*intuition* skill (that 'gut feeling' which robots do not have), and many personality-based specialty skills that are completely useless to a robot, no matter the PL. Another interesting example is the lack of the *gamble* specialty skill—robots are routinely prohibited from gambling; they possess excellent memory and deduction skills and could win too easily. This doesn't stop emancipated robots from owning gambling houses though. Yet another restriction is that robot without a true AI cannot buy the AI Functions broad skill or its specialty skills.

Mindwalker skills will not be listed below as PL9 is generally out of **Foundry's** scope. If you insist on playing such a character, simply use the *PHB* or *Mindwalking - A Guide to Psionics Accessory* for these skill costs.

A robot receives the same amount of skill points as any standard humanoid: $30 + (3 \times \text{INT})$.

Free starting robot broad skills are: Armor Operation, Stamina, Computer Science, Knowledge and System Operation, which can be cashed in for 3 skill points each.

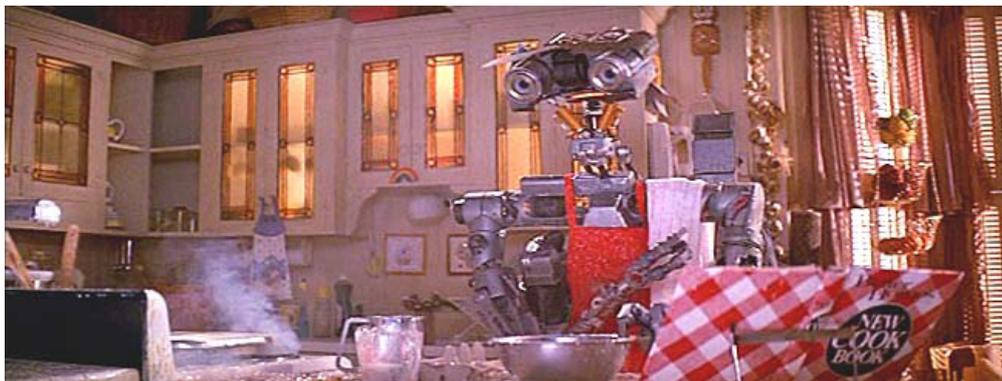
Robots must be at least PL6 to acquire intelligence-based specialty skills and willpower- or personality-based broad skills.

Robots must be at least PL7 to acquire willpower- or personality-based specialty skills.

These two restrictions always apply. A PL5 robot with a PL6 processor (gained through Superior Tech perk for example) will still be unable to acquire intelligence-based specialty skills and willpower- or personality-based broad skills due to lack of relevant programming at PL5.

Robots without 3 ranks in Movement-*swim* and hydro-jet propulsion cannot enter water. Flight and space movement have different requirements, depending on the propulsion method. See **Chapter 4.10 - Propulsion** for details on these requirements.

A robot does not begin with a career; its unique skill set is always designed upon the robot's needs and functions. Thus every robot performing a different function begins with a different skill set, defined by the designer. You, as the designer, can freely spend all of available Skill Points on whatever skills you find relevant to the robot's function. Remember that a bad selection cannot be undone without special systems (like self-editing OS module), or a memory wipe. Remember that a skill can never be cheaper than 1 skill point.



#5, Short Circuit, 1986. A PL5 robot that has a lot of interesting skills, very unrealistic but a classic nevertheless.

Table 5.3. Physical Skills

Strength skills	Cost	Profession
Armor Operation	7	C
Combat operation	3	C
Powered armor	4	C
Athletics	3	-
Climb	2	-
Jump	1	-
Throw	2	-
____(Specific)	1	-
Heavy Weapons	6	C
Direct fire	4	C
Indirect fire	4	C
Melee Weapons	6	C
Blade	3	C
Bludgeon	3	C
Powered	4	C
Unarmed Attack	5	-
Brawl	3	C
Dexterity skills	Cost	Profession
Acrobatics	7	F
Daredevil	4	-
Dodge	4	CF
Fall	3	F
Flight	2	-
Zero-G training	2	CT
____(Specific)	1	-
Manipulation	6	-
Lockpick	4	F
Pickpocket	4	F
Ranged Weapons, Modern	6	C
Pistol	4	C
Rifle	4	C
SMG	4	C
Stealth	7	F
Hide	4	F
Shadow	4	F
Sneak	5	F
Vehicle Operation	3	-
Air	5	T
Land	3	T
Space	5	T
Water	3	T
Constitution skills	Cost	Profession
Movement	3	-
Race	2	-
Swim	1	-
Trailblazing	3	F
Stamina	3	-
Endurance	4	C

Cost: Cost to purchase a broad skill or a rank in the speciality skill.
 Profession: Relevant professions that reduce the skill's price.
 Green-printed speciality skills cannot be used untrained.

Table 5.4. Mental Skills

Intelligence skills	Cost	Profession
AI Functions	6	-
Multitask	5	-
Prediction	5	-
Remote	4	-
Business	3	D
Corporate	4	D
Illicit business	5	DF
Small business	4	D
Computer Science	5	T
Artificial Intelligence	3	T
Hacking	3	T
Hardware	2	T
Programming	2	T
Demolitions	6	CT
Disarm	4	T
Scratch-build	4	T
Set explosives	3	CT
Knowledge	2	-
Computer operation	1	-
Deduce	4	-
First aid	2	-
Language	2	-
____(Specific)	2	-
____(Specific)	1	-
Law	4	DF
Court procedures	3	D
Law enforcement	3	CF
____(Specific)	1	-

(INT skills, continued)

Life Science	5	T
Biology	2	T
Botany	2	T
Genetics	2	T
Xenology	3	T
Zoology	2	T
Medical Science	6	T
Forensics	2	T
Medical knowledge	2	T
Psychology	4	T
Surgery	5	T
Treatment	3	T
Xenomedicine	4	T
Navigation	4	T
Drivespace	2	T
System	1	T
Surface	1	T
Physical Science	4	T
Astronomy	1	T
Chemistry	1	T
Physics	1	T
Planetology	1	T
Security	4	CF
Protection	2	CF
Security devices	2	FT
System Operation	3	-
Communication	1	DT
Defenses	1	CT
Engineering	1	T
Sensors	1	FT
Weapons	1	CT
Tactics	6	CT
Infantry	3	C
Space	3	T
Vehicle	3	CT
Technical Science	4	T
Invention	3	T
Repair	1	T
Robotics	3	T
Technical knowledge	1	T
Will Skills	Cost	Profession
Administration	3	D
Bureaucracy	3	D
Management	4	D
Awareness	3	-
Perception	2	-
Creativity (+3 penalty)	7	-
____(Specific)	4	-
Investigate	7	FT
Interrogate	5	CF
Search	4	FT
Track	4	F
Street Smart	7	F
Criminal elements	5	F
Grid savvy	3	F
Teach	5	DT
____(Specific)	3	DT
Personality Skills	Cost	Profession
Culture	6	D
Diplomacy	5	D
Etiquette	4	D
____(Specific)	4	D
First encounter	5	D
Deception (+1 penalty)	7	DF
Bluff	3	DF
Bribe	3	DF
Entertainment	6	DF
____(Specific)	4	DF
Interaction (+2 penalty)	4	-
Bargain	3	DT
Charm	3	DF
Interview	4	DF
Intimidate	4	C
Taunt	3	-
Leadership (+3 penalty)	5	-
Command	5	CD
Inspire	5	CD

Cost: Cost to purchase a broad skill or a rank in the speciality skill.
 Profession: Relevant professions that reduce the skill's price by 1.
 Green-printed speciality skills cannot be used untrained.

5.6. Other

Now, after having distributed attribute points, picking any perks or flaws (though these are not mandatory) and choosing skills, it's time to fill out the character sheet with all the little numbers that define a robot's other capabilities.

Action Check

The action check score is calculated slightly differently than for a biological hero. It is more a function of intelligence than actual dexterity, due to the speed at which the robot perceives its surroundings. A robot's initial reaction time may in fact be much slower than that of a biological hero, but once they enter a combat mode robots are slightly faster than biologicals.

The formula is no longer: $AC = (INT + DEX) / 2$, but is replaced with: $AC = (2 \times INT + DEX) / 3$, rounded to the closest value.

A PL5 robot with INT 4 and DEX 2 would have:

$$AC = (2 \times 4 + 2) / 3 = 10 / 3 = 3.$$

A PL7 robot with INT 13 and DEX 11 would have:

$$AC = (2 \times 13 + 11) / 3 = 37 / 3 = 12.$$

A PL8 robot with INT 16 and DEX 16 would have:

$$AC = (2 \times 16 + 16) / 3 = 48 / 3 = 16.$$

The rest of the related numbers are calculated as for any other hero; the final action check score is usually increased by 1, 2 or 3, depending on the profession, and then divided according to phases. See *PHB* page 38 for more information on how to do this.

Note: Robots without profession benefits (such as a PL5 Tech Op or Diplomat robot), via the **Profession Unleashed Alternative Rule**, do not gain any increase to their action check score.

The accelerator chipset system can affect this score by +2, +3 or +4, depending on the quality. Remember to always first calculate the action check score, and then apply profession and other modifiers. See **Chapter 6. Examples**.

Action Check Modifier

The base action check modifier is solely a function of the processor. Low PL processors are terribly slow, while high PL ones are generally faster than a biological hero. Depending on the quality and Progress Level, action check modifiers can range from +d12 to -d12. This score is then modified by any relevant perks/flaws the player has chosen for the robot.

There are systems like the boost chipset that affect this score, so be sure to calculate them in, if you're about to use them.

Actions Per Round

The 'actions per round' statistic defines the speed at which a robot operates in a stressful situation. It is no longer a function of will and constitution, as for biological heroes, since the robot's processor's speed and its actuators are the main force behind this statistic. Thus, it is calculated a lot differently than for a biological hero:

$$A/R = (INT + DEX) / 8, \text{ to a minimum of } 1.$$

A PL5 robot with INT 5 and DEX 1 will have:

$$A/R = (5 + 1) / 8 = 6 / 8 = 1$$

A top line PL8 robot with INT 16 and DEX 18 will have:

$$A/R = (16 + 18) / 8 = 34 / 8 = 4$$

Certain hardware upgrades like the accelerator chipset can temporarily modify this number.

Combat Movement Rates

The robot can walk, run, drive, fly, glide, swim and finally boost through space. This statistic is calculated exactly as for biological heroes - via strength and dexterity. See **Table P8: Combat Movement Rates** in *PHB*, page 39.

Besides strength and dexterity, the speed value depends on the robot's size and propulsion method. See **Table 3.1 - Robot Sizes** for more information on size factors.

Example 1: A medium size robot with STR+DEX=22, with two feet would have sprint speed of 22, run speed of 14 and walk speed of 4 meters per phase.

Example 2: The same robot but on tracks receives a -25% penalty to speed and previous rates fall to 16 / 10 / 3, respectively.

Example 3: A diminutive robot with STR+DEX=20 gains a -6 penalty for this calculation in start. If it has no actuators and is using a gravitic engine, no other modifiers apply, to a resulting 18 fly speed.

Example 4: A huge robot with STR+DEX=20 on 5 wheels receives a +4 bonus and a 50% increase to movement rate, up to the maximum value of 32/22/8 sprint/run/walk rates.

Example 5: A robot uses an ion engine. Such a propulsion method has basically nothing to do with the robot's strength or dexterity, and has a fixed acceleration rate no matter the size, strength and dexterity of the robot. See **Chapter 4.10 - Propulsion** for more details.

Brawling

Robots do not fight unarmed; they ram and brawl. All damage a robot inflicts by ramming and/or its limbs is low impact (Li) and of Ordinary strength, except that made by robots over 3m (huge and larger) which is of Good strength. The mass of the robot alters the damage it inflicts in combat; robots with a chassis made of base metals inflict damage as one category larger robots, while robots with casing made of mono-filament or lighter inflict damage as one category smaller robots.

Table 5.5. Robot Brawling Damage

Size	Damage		
	d4-3s	d4-3s	d4-2s
Under 10 cm	d4-3s	d4-2s	d4-1s
11 cm to 50 cm	d4-2s	d4-1s	d4s
51 cm to 1 m	d4s	d4+1s	d4+2s
1 m to 2 m	d6s	d6+1s	d6+2s
2 m to 3 m	d8s	d6+1w	d8+1w
Over 3 m	2d8s	d6+3w	d6+1m
	3d8s	2d6+1w	d6+3m

Money

An emancipated robot begins the game with the same amount of funds a biological hero with its profession would. Filthy Rich and Dirt Poor perk and flaw work the same as they would for a biological hero. A non-emancipated robot doesn't begin with any money at all and is most likely someone's carefully guarded property, equipped with a restraining bolt.

6. EXAMPLES

This chapter provides some examples of robot construction with two robots per every Progress Level. These robot designs will attempt to be both useful and realistic in their intended function and monetary restrictions. Exotic robots would be constructed just the same, but would probably cost more.

6.1. CIMDR 13 Counter-insurrection military defense robot (PL 5)

Concept: Military robot for Foothold situations - in case a military base is compromised by unknown assailants or by a rebellion, this robot serves to seek and destroy all organic life forms. Packing as much heavy weaponry as possible and the heaviest armor available, mobility is of secondary concern. It is configured to fit inside standard-sized hallways and if it cannot enter a room through the door it will make a hole in the wall. It relies on ranged weaponry, though can fight unarmed once it depletes the ammunition magazine. In a long hallway a powerful bullet burst may be far more destructive than a melee weapon.

Size: Large size, h=10, CON 7-14, +2 movement modifier, -1 dexterity resistance modifier penalty, +1 Stealth skill penalty, max STR 16, max DEX 13. Approximate weight: 350 kg.

Shape: Quasi-humanoid, two massive legs with feet, a broad body with heavy weapon system mounted on its side, no arms, no head.

Durability and Chassis Points: CON 13, 170 Chassis Points, 10%=17CP, 5%=9CP, 1%=2CP.

Monetary restriction: 100K, without weaponry.

With a 'realistic' monetary restriction, a 'realistic' robot was designed. It has no space for weapon or limb upgrades but doesn't need any. If the heavy weapon is fitted with a power-based one (i.e. a laser) it could be powered directly from the fuel cell. Also, in that case the magazine could be thrown out and replaced with some other needed systems. This robot does break the budget but not by much. Let's continue to fill out the character sheet for this excellent supporting cast member.

Sensors: Cannot use IR sensor and motion sensor at the same time without penalties.

Profession: Combat Spec, specialization bonus goes to Heavy Weapons broad skill.

Attributes: STR 14, DEX 7, CON 13, INT 8, WIL 3, PER 3, spending 48 attribute points, a realistic amount for this kind of robot. It is not a hero so the 60 point restriction does not apply.

Perks: Tough as Nails (SP cost: 4). The CIMDR-13 robot is one tough cookie, its chassis is designed to resist blunt stress.

Flaws: Slow (SP gained: 6). Unfortunately the entire CIMDR series was too slow and was later replaced with smaller and more agile robots.

Perk/Flaw balance: +2 SP bonus.

Skill points gained: 54 + 2 (perk/flaw) = 56SP

Skill distribution: Cannot buy INT-specialty skills and WIL- or PER- broad skills.

Maximum active slots: 5

Maximum ranks: 3

Skill	Rank	Cost
Armor Operation		Free
Combat armor	3	6
Athletics		3
Jump	2	4
Heavy Weapons		5
Direct fire	3	9
Indirect fire	3	9
Unarmed Attack		5
Brawl	3	6
Stamina		Free
Endurance	3	9
Computer Science		Free
Knowledge		Free
System Operation		Free

The processor restriction on active memory slots is 5. One slot is needed for OS, one for a broad skill, and three are left for a speciality skill.

The robot can do only one thing at a time. If it needs to shoot it has to spend an action to unload the *combat armor* speciality skill and load *direct fire* skill, and reverse if it wants to move. This process is very, very slow, hence the

System type	System	Cost	CP	PP	Special / Reasoning
Chassis material	Base metal	\$200	+170	0	No extra Chassis Points.
Power supply	Fuel cell	\$7.5K	35	+70	Special power socket.
Processor	PL 5, Good	\$300	3	6	Mact 5, Mrnk 3, Mint 8, Mwil 5, Mper 3, ACmod +d6, MA/R 3
Actuators	Hydraulic	\$17K	34	39	STR 12-18, DEX 2-7
Cabling	Parallel	\$170	17	-	Mact 2, Power mod +2.
Sensors	IR sensor	\$3K	3	1	Senses heat in the dark.
	Motion sensor	\$4K	3	1	Detects nearby motion.
	Pickup/voicebox	\$100	1	1	Able to request surrender.
	Video	\$200	1	1	Able to see the enemy.
Data ports	Socket	\$50	1	1	Prevents remote hacking.
Limbs	2 Legs	-	-17/+17	-	These points are distributed between 2 legs.
Manipulators	1 Claw	\$50	1	1	Installed in chassis.
Propulsion	2 Feet	\$7.95K	17	8.5	Uses all leg space.
Casing	Kevlar, heavy	\$65K	26	-	d6-1 Li / d6-1 Hi / d6-2 En / C2
Weapon support	Heavy mount	\$7K	20	-	Supports a heavy weapon up to 10kg.
	Magazine	\$1K	5	-	Up to 500 bullets.
Miscellaneous	Security system	\$3K	2	2	Sets off alarm in case of unauthorized access to chassis, connected to self-destruct.
	Self-destruct, ordinary	\$500	1	1	Activates if the robot is helpless and being accessed without authorization.
		\$107.77	170/170	63/70	

Slow flaw. Once in movement, however, the robot is reasonably fast and can deal enormous amounts of damage with a proper heavy weapon in weapon fire mode.

Action check: 8. Profession bonus is +3. Marginal: 12+, Ordinary: 11, Good: 5, Amazing: 2

Action check modifier: +d6 processor, +1 step penalty from Slow flaw, results in +d8 penalty.

Actions per Round: 1.875, rounded to 2.

Movement rate: 21 + 2 movement bonus from size, resulting in: Sprint speed 22, Run speed 14, Walk speed 4. No other speeds, can't swim.

Brawling: Large robot, base metal chassis (+1 size increase for purposes of brawling): huge robot damage rates: 3d4s / 2d4w / d4+1m, and thus increases to Good toughness.

6.2. Voyager 3 series planetary exploration robot (PL 5)

Concept: A space probe that is launched from a ship and equipped with a solar sail, programmed to explore a single planet from orbit, relay the data, try to survive the landing and, if successful, perform basic tests on the atmosphere and soil quality/content. It is fitted with a special solar sail to facilitate travel to a planet, and after one or two passes around the planet in a decaying orbit, it starts the fall. The solar sail is detached and the robot deploys a basic parachute

system that may or may not allow it a successful landing, depending on the atmosphere density and pressure. Once landed it extends tracks, detaches the parachute (a robot without arms can't fold it, and won't use again anyway) and starts collecting data on its environment. The robot should be as cheap as possible since once its batteries run out it shuts down and is usually never recovered.

Size: Medium size, h=5, CON 6-12, max STR 14, max DEX 14, approximate weight 250 kg with the solar sail, 150 without it.

Shape: Sphere-like bulky body to survive the atmospheric friction, no legs but tracks, one extendable limb with a claw to collect samples, no head, extendable sensory equipment mounted in the chassis.

Durability and Chassis Points: Good constitution is required for a successful atmospheric re-entry: CON 11, 95 Chassis Points, 10%=10CP, 5%=5CP, 1%=1CP.

Monetary Restriction: 100K without the solar sail, which stays in orbit and can be easily retrieved by a ship.

Far under the monetary restriction, this fully-functional robot is under-powered in case it lands on a dark side of a non-rotating planet. It will not be able to use the radar, uplink and other functions simultaneously but will have to switch power amongst its systems. It has no room for upgrades since it will never receive any.

Sensors: May operate only two simultaneously. Usually these are video and radar when moving and chemical sniffer and metal detector when performing analysis.

Profession: Tech Op, under Profession Unleashed Alter-

Skill	Rank	Cost	Reasoning
Armor Operation		Free	
Acrobatics		7	
Dodge	1	4	Attempts to dodge an incoming asteroid or similar hazard.
Fall	1	3	Re-entry in difficult atmospheric conditions such as planetary-scale violent storms.
Flight	1	2	Trying to fly through a space gas cloud with the solar sail as propulsion.
Zero-G training	1	1	Once the sail is detached to maneuver into appropriate fall trajectory.
Vehicle Operation		3	
Space	1	4	Solar sail redirection from programmed course in case of a blocked path.
Stamina		Free	
Endurance	1	4	Very dense atmospheres where friction is higher than usual.
Movement		3	
Race	1	2	Escaping dangerous native predators or incoming dust or electrical storms.
Computer Science		Free	
Knowledge		Free	
Life science		4	Analysis of a biological compound.
Navigation		3	Nvigation of a planetary body or an asteroid field.
Physical Science		3	Analysis of a mineral compound.
System Operation		Free	
Technical Science		3	Re-enty damage analysis and possible course of action to alleviate the damage.

System type	System	Cost	CP	PP	Special / Reason
Chassis	Metallic alloys	\$250	+97	-	2% extra Chassis Points.
Power supply	Photocells	\$16.5K	23	+23	Over 10% requirement, needs 12 hours in the sun to operate.
	Recharge battery	\$1200	10	+20	Will provide one day of operation in case of a sunless world.
	Dual controller	\$2K	2	-	Allows simultaneous use of both power supplies.
Processor	PL5, Ordinary	\$200	2	3	Mact 3, Mrnk 1, Mint 7, Mwill 4, Mper 2, MA/R 2, ACmod +d8
Actuators	Servo	\$250	5	5	STR 4-10, DEX 6-10, will operate even in no-atmosphere planetary environments.
Cabling	Serial	\$50	5	-	Sufficient for its function.
Sensors	Chemical sniffer	\$9K	5	1	Analyses the atmosphere.
	Metal detector	\$2K	5	2	Analyses the soil for possible metal ores.
	Video	\$200	1	1	Records and transmits its surroundings.
	Radar	\$15K	10	10	Records terrain layout while descending and once landed.
Data ports	Socket	\$50	1	-	Receives programming through it.
	Uplink	\$3K	5	10	Transmits information recorded to ship.
Limbs	1 Arm	-	-5/+5	-	
Manipulators	Claw	\$50	1	1	Claw allows taking samples for analysis (mounted in limb).
	Extendable	\$300	3	1	Extends the Claw's reach (mounted in limb).
Propulsion	2 Tracks	\$700	10	5	Allows easy movement in unexplored terrain.
Casing	Photocell, light	-	-	-	Already purchased.
Tools	Chemical analyser	\$5K	3	2	Small soil-analysing tool.
Miscellaneous	Clamps	\$500	5	-	Needed to connect to the Solar Sail and to the external parachute.
	Storage Space	\$50	1	-	Needed for collection of soil samples.
		\$56.7K	97/97	41/43	

native Rule. Does not receive the accelerated learning rate nor action check score increase.

Attributes: STR 10, DEX 8, CON 11, INT 7, WIL 4, PER 1, spending 41 attribute points. The robot has personality score 1 since it never speaks using a language, only relays information. Higher strength is needed for overcoming rough terrain.

Perks: Observant (SP cost: 3). Since the robot cannot buy the Awareness broad skill nor Awareness-*perception* speciality skill, this bonus simply negates the Will feat penalty when making observation checks.

Vigor (SP cost: 3). The Voyager 3 chassis is quite sturdy due to its requirements to survive atmospheric re-entry. One extra wound point may be the difference between success and a loss of almost \$60K.

Flaws: None. The Voyager 3 series was quite successful due to no inherent flaws in the design.

Perk/Flaw balance: 6 SP penalty.

Skill Points gained: 51 - 6 (flaw/perk) = 45SP

Skill distribution: Cannot buy INT-speciality skills and WIL- or PER-broad skills.

Maximum active slots: 3

Maximum ranks: 1

Action check: 7. No Profession bonus. Marginal: 8+, Ordinary: 7, Good: 3, Amazing: 1.

Action check modifier: +d8 processor

Actions per round: 1.875, rounded to 2. Due to serial cabling, this is reduced to 1.

Movement rate: 18 + 0 movement bonus from size, +2 meters to run speed when *race* is loaded into memory, 25% speed penalty due to tracks, resulting in: Sprint speed 14, Run speed 9/11, Walk speed 3. No other speeds, can't swim.

Brawling: Medium robot, metallic alloy chassis (+0 size increase for purposes of brawling): medium robot damage rates: d6s / d6+1s / d6+2m.

6.3. Robot-Cop series law-enforcement robot (PL 6)

Concept: Enforcing the law in ultra-dense urban environments is an extremely dangerous job. A robot should be able to perform this task, be hard to destroy, and yet also be able to regulate standard city affairs like the classic "helping the old lady cross the hoverway" example. The robot should be as humanoid-looking as possible making it

Skill	Rank	Cost	Reasoning
Armor Operation		Free	
Combat armor	2	4	Needed to support the armor.
Unarmed Attack		5	
Brawl	1	2	Used only to deal non-lethal force.
Acrobatics		7	
Flight	1	1	Bare minimum to fly safely.
Ranged Weapons Mod.		5	
Pistol	3	9	Standard weapon used.
Stamina		Free	
Computer Science		Free	
Demolitions		5	Recognition of explosive devices, doesn't cover disarming.
Knowledge		Free	
Law		4	
Law enforcement	3	6	Knowledge of all the laws and procedures.
Security		3	Basic security protocols.
System Operation		Free	
Awareness		3	Needed to use imaging sensors optimally.
Investigate		6	Basic protocols only.
Interaction (+2 penalty)		4	Ability to speak coherently, ask questions and process answers as a human would.

System type	System	Cost	CP	PP	Special
Chassis	Metallic alloys	\$250	+97	-	2% extra Chassis Points.
Power supply	Lathanide Capacitors	\$9.5K	21	+63	Wouldn't want to install a fusion reactor that could blow up in an urban environment.
Processor	PL6, Amazing	\$3K	4	5	Mact 9, Mrnk 7, Mint 11, Mwil 8, Mper 6, MAR 4, ACmod +d0
Actuators	T'sa electromotor	\$10.5K	15	22.5	STR 6-12, DEX 8-12
Cabling	Optic	\$250	5	-	Power boosting could cause destruction of government property and is thus disabled.
Sensors	Pickup/voicebox	\$100	1	1	Must be able to communicate verbally.
	Video	\$200	1	1	Must be able to visually identify suspects.
	Hi-res video	\$2K	2	1	Usable to locate a suspect in a distant crowd.
	Life recorder	\$2K	1	1	Records everything a suspect says, "which can be used against ..."
Data ports	Weapon detector	\$2K	1	1	A must-have for a law-enforcing robot (right arm).
	Wireless	\$300	1	2	Constant communication with the dispatcher, ability to request assistance (right arm).
Limbs	Encryption module	\$700	1	1	Police frequencies should not be spied upon (right arm).
Manipulators	2 Arms, 2 Legs	-	-20/+20	-	Humanoid appearance.
	2 Hands	\$400	2	2	Ability to operate various items including normal weaponry. (left and right arm)
Propulsion	2 Feet	\$5.5K	10	5	Feet take up all of the leg space.
	Hover-jet	\$40K	10	20	Able to pursue Sky-cars, and to monitor the streets.
Casing	Alloy, heavy	\$45K	15	-	d6+1 / d6+1 / d6 / C2. A most reasonable choice of armor.
Weapon support	Pistol holder	\$300	2	-	Integrates a small pistol, up to 1 kg into one arm (left arm).
	Magazine	\$200	1	-	50 bullets is quite enough for this weapon (left arm).
	Eject system	\$500	1	-	Allows easy maintenance (left arm).
Miscellaneous	Storage space	\$50	1	-	Storage for hand-cuffs, evidence or other material, up to 1kg.
	Security alarm	\$3K	2	2	Connected via wireless to the dispatcher, in case a robot is opened (right arm). The robot has no self-destruct since "willful (self)destruction of government property..."
		\$125.75K	97/97	65/63	

easier to interact with humans, should have relatively high personality skills in order to communicate fluently and truly interactively. It should also be able to pursue criminals and arrest them. Size is also of concern, too small a robot would lack intimidation value, while too large of one would be ineffective in an urban environment. It must have the ability to use standard-sized weaponry, yet it also must have a last-resort weapon of some kind. Its processor should be as agile as possible, able to distinguish the difference between an armed robbery and pick-pocketing for example, and be able to react accordingly. Whenever the robot is in doubt of how to handle a situation (and such cases will likely be in an abundance), it must be able to request assistance.

Size: Medium size, h=5, CON 6-12, max STR 14, max DEX 14, approximate weight 130 kg.

Shape: Humanoid, two legs, two arms, a head. Possibly an integrated weapon in one limb.

Durability and Chassis Points: Good constitution as not to be destroyed easily: CON 11, 95 Chassis Points, 10%=10CP, 5%=5CP, 1%=1CP.

Monetary Restriction: 150K, without weaponry.

Well under the monetary restriction, the robot has all the necessary equipment its job requires. The design is perfectly tuned to fill up all available space, yet the power requirements are somewhat tight. In order to power its hover-jet the robot needs to shut down power to its feet, which does make sense. The limb spaces are fully filled with equipment or weaponry. This robot could easily be a PL6 robot hero, as its statistics will demonstrate.

Sensors: May operate up to five simultaneously. In other words, it may freely use all of its sensors.

Profession: Combat Spec. This robot could be a Free Agent under Profession Unleashed Alternative Rule, but since its function are dangerous missions Combat Spec serves it best. The specialization bonus goes to Ranged Weapons, Modern.

Attributes: STR 12, DEX 12, CON 11, INT 11, WIL 8, PER 6, spending full 60 attribute points. Hero or not, this robot is as powerful as the best of them.

Perks: Reputation (SP cost: 3). The robot is a well-known law-enforcement model and is both respected and feared as such.

Hardened Casing (SP cost: 4). With hundreds of bullets been shot at it, the casing held and has been uniquely patched.

Flaws: Old-Injury (SP gained: 6). This very robot has been a victim of a powerful explosion that shook its casing. Whenever required to sky-dive, the casing buckles under stress and this flaw resurfaces.

Honesty Regulators (SP gained: 2). As a law-enforcement robot, it is forbidden to lie. It may be impractical but such is the law.

Perk/Flaw balance: +1 SP bonus.

Skill Points gained: 63 +1 (flaw/perk) = 64 SP

Skill distribution: Cannot buy WIL or PER speciality skills.

Maximum active slots: 9

Maximum ranks: 7

Action check: 11. Profession bonus: +3. Marginal: 15+, Ordinary: 14, Good: 7, Amazing: 3.

Action check modifier: +d0 processor.

Actions per round: 3, supported by both processor and cabling.

Movement rate: 24, 0 movement bonus from size, resulting in: Sprint speed 24, Run speed 16, Walk speed 6, Fly speed 48. Cannot glide or swim.

Brawling: Medium robot, metallic alloy chassis (+0 size increase for purposes of brawling): medium robot damage rates: d6s / d6+1s / d6+2m.

6.4. SSARR 0A Space Ship Autonomous Repair Robot (PL 6)

Concept: The 0A series of robots should be small and multifunctional. They should know a bit about every technical system on the ship, and be able to spot or detect a malfunction, and hopefully be competent enough to repair it. If it's a complex malfunction like weapon-grade damage they could execute the repairs under supervision of a remote technician, especially useful if the damaged system is open to vacuum. The robot must be able to operate independently and in open space, for example when repairing the ship's armor casing. The size should be smaller than humanoid, to make it able to fit into small spaces. Propulsion method should be dual, tracks and some form of zero-g propulsion. It should have at least one arm to be able to reach inside systems and to operate normal tools more easily; otherwise it would be limited only to the tools it has installed. It should include a wide variety of tools and sensors but not a periscope, which is somewhat useless on a starship.

Size: Small size, h=3, CON 5-10, max STR 12, max DEX 16, approximate weight 55 kg. Dexterity resistance modifier bonus +1, speed modifier -2, -1 bonus to Stealth skill checks.

Shape: Small and bulky, with dual tracks and a single arm protruding from the chassis, which operates tools. No head is required.

Durability and Chassis Points: This robot needs more space than durability: CON 6, 72 Chassis Points, 10%=7CP, 5%=4CP, 1%=1CP.

Monetary Restriction: 150K.

This 0A series robot is 'armed to the teeth' with all it will ever need to fix practically every ship problem - that is technical or mechanical in nature. At a financial cost of almost half the original assessment, this small robot is quite a bargain. It has all of its space filled with useful equipment and has enough power to operate everything at once, even if it needed to run its tracks while flying through space. The problem occurs if the ship's spacewave transmitter is damaged. Robots of this series have 48 hours to repair it, and will only barely function at that time. They certainly won't be able to use the Zero-G thrusters and simple movement itself (actuators and propulsion) will take over 50% of the power their lanthanide capacitors can provide. The same reason prevents them from long-range space missions - once outside the spacewave transmitter's range they are almost completely lost and will have to boost their power in order to switch on all the systems needed to get back.

Sensors: May operate up to five simultaneously. The 0A series robot switches between Hi-res video and IR sensor as needed.

Profession: Tech Op. The accelerated learning curve makes veteran robots very expensive because of their accumulated experience.

Attributes: STR 4, DEX 10, CON 6, INT 11, WIL 4, PER 1, spending 36 attribute points. The robot could be boosted with systems to become a hero, supporting 60 attribute points, but it would be much more expensive and impractical in the long run. Due to a low personality score the robot does not speak but beeps and whirrs when having something to say, which is quite irritating but thankfully rare.

Perks: Good Luck (SP cost: 3). For some yet unknown reason the 0A series of robots have a 35% higher survival rate and 25% higher success at repairs than SSARR 09 series, a few years older model.

Popular Model (SP cost: 2). Due to the excellent capability improvements this model shows over the SSARR 09 series, it became a hit in mere weeks since its debut.

Self-editing OS module (SP cost: 4). Another reason for its popularity, the 0A series is capable of upgrading its software on the fly, adapting to the environment.

Flaws: Delicate (SP gained: 3). The only problem with having a plethora of equipment in such a small chassis is its vulnerability to higher-than-normal stress.

Perk/Flaw balance: -6 SP penalty.

Skill Points gained: 63 - 6 (flaw/perk) = 57 SP

Skill distribution: Cannot buy WIL or PER speciality skills.

Maximum active slots: 9

Maximum ranks: 7

Action check: 11. Profession bonus: +1. Marginal: 13+, Ordinary: 12, Good: 6, Amazing: 3

Action check modifier: +d0 processor, -d4 if boosted.

Actions per round: $(11+10) / 8 = 2.625$, rounded to 3, supported by both processor and cabling.

Movement rate: 14, -2 movement bonus from size, -25% penalty for tracks resulting in: Sprint speed 10, Run speed 6, Walk speed 3. Zero-G maximum acceleration of 40 meters per second squared. No other movement modes.

System type	System	Cost	CP	PP	Special
Chassis	Cerametal alloys	\$1500	+77	-	6% extra Chassis Points.
Power supply	Spacewave receptor	\$6.5K	11	+44	Small and cheap.
	Lathanide capacitors	\$5.5K	7	+18	Spacewave transmitter damage is quite possible in battle.
	Fast switch	\$500	1	-	Primary power failure needs immediate switch to secondary.
Processor	PL 6, Amazing	\$3K	4	5	Mact 9, Mrnk 7, Mint 11, Mwill 8, Mper 6, MA/R 4, ACmod +d0
	Boost Chipset, Ordinary	\$2K	1	1	In a crisis, the robot needs to act quickly.
Actuators	Muscle wire	\$400	4	6	STR 2-6, DEX 8-12, sufficient for this robot needs.
Cabling	Wave-based	\$2K	4	-	MA/R 3, Powermod -1.
Sensors	IR sensor	\$3K	3	1	Detects heat differences.
	Pickup/voicebox	\$100	1	1	Can hear, and produce sound.
Data ports	Video	\$200	1	1	Normal sight.
	Hi-res video	\$2K	2	1	Allows zooming to locate very small cracks.
	EM detector	\$5K	2	2	Detects electromagnetic radiation.
	Imaging scanner	\$4K	1	1	Allows looking into things to find damage (on arm).
	Socket	\$50	1	-	Can be programmed by plugging into the robot.
	Telepresence link	\$450	1	2	Same as wireless but allows remote operator to take over.
Limbs	1 Arm	-	-4/+4	-	Can operate things on distance.
Manipulators	Claw	\$50	1	1	Mounted on the limb (on arm).
Propulsion	Tracks	\$550	7	3.5	Moves smoothly over anything and uses little space and power.
	Zero-G thrusters	\$29K	7	10.5	Allows open-space movement and repairs.
Casing	Polymeric, light	\$2K	4	-	d4-1 / d4-1 / d4-2 / - , luckily the 0A series robots can repair each other.
Tools	Various	\$10K	11	6	15% space dedicated to screwdrivers, welding torches, circuitry testers etc. 15% primary power for these seems reasonable.
Miscellaneous	Storage space	\$150	3	-	Allows storage of components up to 3 kg in weight.
		\$78.4	77/77	42/44	

Skill	Rank	Cost	Reasoning
Armor Operation		+3	Sold: 0A series doesn't come in heavy armor variety.
Acrobatics		7	
Zero-G training	3	3	Needed for proper zero-g movement.
Vehicle Operation		3	
Space	1	4	In case of emergency the 0A series can save the day.
Stamina		+3	Sold: Due to high-risk jobs, 0A units are usually destroyed if hit.
Computer Science		Free	
Hardware	3	3	Detection of hardware problems.
Programming	3	3	Optimizing equipment and systems onboard.
Knowledge		Free	
Computer operation	3	3	0A series robots communicate constantly with various other systems.
Deduce	1	4	Required to deduce a complex technical problem and its solution.
Navigation		3	
System	1	1	In case of emergency, 0A robot can safely navigate a small ship.
Physical Science		3	
Physics	3	3	Needed for complex damage assessment.
System Operation		Free	
Communications	1	1	Operation of ship's communications to determine if there's a malfunction.
Defenses	1	1	Operation of ship's defenses to determine if there's a malfunction.
Engineering	1	1	Operation of ship's engines to determine if there's a malfunction.
Sensors	1	1	Operation of ship's sensors to determine if there's a malfunction.
Weapons	1	1	Operation of ship's weapons to determine if there's a malfunction.
Technical Science		3	
Repair	3	3	The robot's primary function.
Robotics	3	6	Must be able to repair other units.
Technical knowledge	3	3	Has entire ship schematic database installed.
Awareness		3	

Brawling: Small robot, cerametal alloys chassis (+0 size increase for purposes of brawling): small robot damage rates: d4s / d4+1s / d4+2s.

6.5. XCPMR Series Multifunction robot (PL 7)

Concept: As its name implies, this robot's main strength is its ambiguity. It's a hunter-killer robot, disguised as a Communications and Protocol Multifunction Robot. The "X" stands for "Experimental", a subtle designer's pun. While it packs a large set of skills, most of them perfectly legal, it does have set of hidden commands, the content of which may or may not be known to the robot. Such a robot should use much advanced equipment, to enable it usage of all the trivial skills and to be effective at performing its 'other' tasks, which may range from simple assassinations to bounty-hunter class missions. It should look as meek as possible, and have some tricks up the sleeve. Standard size and propulsion methods would serve it best, as not to look uncommon. The design of the robot may or may not revolve around some existing and perfectly legal CPMR robot to provide it anonymity, as suits the mission type. If the target has no regular CPMR units, the resemblance would raise more questions than answer them. The price is not an issue, though it shouldn't exceed some reasonable levels; these units, while mostly prototypes and thus highly expensive, are made for high-risk jobs.

Shape: Humanoid, two legs, two arms, a head. No integrated weaponry since it provides a risk of being recognized.

Size: Medium size, h=5, CON 6-12, max STR 14, max DEX 14, approximate weight 120 kg.

Durability and Chassis Points: Ordinary constitution as not to be unusual. CON 8, 110 Chassis Points, 10%=11CP, 5%=6CP, 1%=1CP.

Monetary Restriction: 250K.

At just below the budget line, the XCPMR series robot is a terror to behold. State of the art equipment packed below sub-standard casing and innocent-looking actuators, this robot hits where it hurts the most. It can blow up an entire building and fly out whistling, or can interrogate a subject before killing him, depending on the mission. A true hunter-

killer that relies on deception, this robot can be a powerful (though quite illegal) weapon of any government, criminal lord, or military general. The price tag is high but not without a reason; not many robots can proudly (and pseudo-emotionally!) proclaim that they are a step before their time. The original design leaves a lot of space and power for upgrades, and specific mission customizations. Weapons can be easily integrated and armor replaced with some of sturdier quality, but that would make this unit a war-robot, something it's not designed nor programmed to emulate. Though, if the mission was to pretend to be a military robot, in order to get at some high-ranking military target...

Sensors: May operate up to five simultaneously, meaning all of its sensors.

Profession: Free Agent. The bonus resistance modifiers go to strength and dexterity.

Attributes: STR 8, DEX 12, CON 8, INT 14, WIL 9, PER 9, spending full amount of 60 attribute points. The robot could be a terrific hero or villain's henchman.

Perks: Hidden System (SP cost: 4). The key-code generator is safely tucked away under a thick sheet of nano-lead, preventing both visual and sensory scans.

Superior Tech (SP cost: 5). With access to prototype technology, the robot's (obviously) well-connected designer made this unit extra devious.

Fuzzy Logic (SP cost: 4). Advanced deception algorithms and truth-false bending routines allow this robot to disobey and deceive anyone not careful enough.

Flaws: Secret Orders (SP gained: 3). This unit can ship directly to a customer (usually the assassination target or someone close) with memory wiped but hidden orders in place.

Asimov Circuits (SP gained: 3). Adding to an even more benevolent first impression, this robot cannot harm the target's species... except when overridden by the Secret Orders.

Perk/Flaw Balance: -7SP penalty

Skill Points gained: 72 - 7 (flaw/perk) = 65 SP

Skill distribution: No restrictions.

Maximum active slots: 18 (13 after OS and AI emulator)

Maximum ranks: 12

System type	System	Cost	CP	PP	Special
Chassis	Carbon nano-tubes	\$10K	+119	-	8% extra Chassis Points.
Power supply	Mass reactor	\$37K	14	+92	PL7 standard energy source.
Processor	PL8, Amazing	\$75K	2	3	A prototype processor for maximum deception.
	Grid coprocessor	\$5K	1	1	Even more speed when searching for target on-line.
Actuators	Micro-ligament	\$12K	6	12	STR 4-10, DEX 8-14. Perfectly ordinary actuators.
Cabling	Optic	\$300	6	-	MA/R 4. Wouldn't want to fry that processor.
Sensors	IR sensor	\$3K	3	1	Useful for hunting in the dark.
	Pickup/voicebox	\$100	1	1	Standard communication.
Data ports	Imaging scanner	\$4K	1	1	Needed for lock picking and other skills.
	Holo	\$2K	2	2	Improved vision.
	Brainprint scanner	\$8K	5	7	Needed for interrogations.
	Wireless	\$300	1	2	Standard communication.
	Encryption module	\$700	1	1	Needed when reporting back to true superiors.
Limbs	2 Arms, 2 Legs	-	-22/+22	-	Humanoid appearance.
Manipulators	2 Hands	\$200	2	2	Allows use of all normal equipment.
Propulsion	2 Feet	\$5.85K	11	5.5	Normal movement rate.
	Gravitic	\$42K	11	27.5	Allows flight, a trick down the sleeve.
Casing	Cerametal, light	\$6K	6	-	d6-1 / d6-1 / d6-1/-, must use standard CPMR casing.
Defenses	Deflection Inducer	\$10K	5	10	Helps a sudden tactical retreat.
Tools	False restraining bolt	\$3K	1	-	A hacked bolt that serves no actual purpose except deception.
Miscellaneous	Storage space	\$300	6	-	Can hold up to 3 kg of interesting materials like explosives.
	Self-destruct, amazing	\$10K	3	4	Can blow up as a last resort weapon.
	Key-code generator	\$3K	1	1	Illegal only if caught (hidden system).
	AI emulator program	\$5K	-	-	Adds a massive bonus to all robot's efforts.
		\$244.55	89/119	81/92	

Skill	Rank	Cost
Armor Operation		Free
Melee Weapons		6
Blade	1	3
Manipulation		6
Ranged Weapons Modern		6
Pistol	1	4
Stealth		6
Stamina		Free
Computer Science		Free
Knowledge		Free
System Operation		+3
Security		3
Security devices	3	3
Awareness		3
Investigate		6
Culture		6
Deception (+1 penalty)		6
Bluff	3	6
Interaction (+2 penalty)		4

This skill set truly enables the XCPMR unit as a multipurpose robot. While it may seem a bit short on certain specialty skills, a few months or years of experience will quickly sort things out. The robot has enough resources in its Culture database to pretend to be a standard-issue Protocol robot (do keep in mind that, at PL7, protocol robots are very limited), and can substitute a lack of specialty skills with its AI emulator software, *pretending* to be as skilled as the next robot.

Action check: 13. Profession bonus: +2. Marginal: 16+, Ordinary: 15, Good: 7, Amazing: 3.

Action check modifier: -d6 processor.

Actions per round: 3, supported by both processor and cabling.

Movement rate: 20, 0 movement bonus from size, resulting in: Sprint speed 20, Run speed 12, Walk speed 4, Fly speed 40. No glide or swim capabilities.

Brawling: Medium robot, carbon nano-tubes chassis (+0 size increase for purposes of brawling): medium robot damage rates: d6s / d6+1s / d6+2s.

6.6. BSR 9 Series Bodyguard Security Robot (PL 7)

Concept: The need exists to design a quasi-military robot, that would be legally purchasable by anyone, be able to protect its owner from all kinds of attack, and function as a true bodyguard - its functions would include patrolling the estate searching for intruders, security breaches or potential holes, searching for and disarming for explosives, and even Grid-based protection of its owner's avatar. Its weaponry arsenal would depend on the owner's connections - if the owner is able to procure military or restricted weaponry it should be installable in the robot. In case the robot's owner deals only in legal business, the robot must be able to use standard issue commonly available melee weaponry and to fight unarmed. The size of the robot should be as big as possible to discourage any physical attacks, yet not huge to be unable to fit in a vehicle. The shape should provide as much speed and flexibility as possible, probably a pentapod system to gain extra speed in a crisis, and to reach an attacker fast if having to fight unarmed. It may be very difficult to incorporate all these functions in the frame, yet it must be done. It's very likely something will have to be trimmed, likely the ability to fly or some other big and expensive system.

Size: Large size, h=10, CON 7-14, +2 movement modifier, -1 dexterity resistance modifier penalty, +1 Stealth skill penalty. Max STR 16, max DEX 13. Approximate weight 300 kg.

Shape: Quasi-humanoid, five legs with wheels, a short body as not to be too high, two arms with integrated weaponry, no head.

Durability and Chassis Points: Constitution 14, as tough as possible, 160 Chassis Points, 10%=16CP, 5%=8CP, 1%=2CP.

Monetary restriction: 250K, without weaponry.

Reasonably below the budget line, the BSR 9 series ro-

System type	System	Cost	CP	PP	Special
Chassis	Cerametal alloys	\$5K	+186	-	6% extra Chassis Points, 10% extra Chassis Points (perk).
Power supply	Mass reactor	\$15K	18	+126	Standard power supply.
Processor	PL7, Good	\$5K	2	2	Mact 10, Mrnk 8, Mint 14, Mwill 9, Mper 7, MA/R 4, ACmod +d0
	Grid coprocessor	\$5K	1	1	Additional reflexes on-line.
	Accelerator, Good	\$15K	2	5	When needed, the robot can accelerate to extreme speeds.
Actuators	Aleeran	\$16K	16	32	STR 10-18, DEX 4-10, provides a great range but at a price.
Cabling	Gravitic	\$4K	8	-	MA/R 4, Powermod -1, robot will likely do power boosts.
	Extra cabling	\$560	8	-	-2 Powermod. If the robot power boosts, it better succeed.
Sensors	IR sensor	\$3K	3	1	Can see heat in the dark.
	Metal detector	\$2K	5	2	Can search for miniature explosives or spy devices.
	Pickup/voicebox	\$100	1	1	Ability to communicate and hear.
	Hi-Res video	\$2K	2	1	Can zoom on tiny or distant objects.
	Life-recorder	\$2K	1	1	Can act as a movable camera for its owner's needs.
	Sonar	\$9K	5	4	Can operate in complete darkness.
	Weapon detector	\$2K	1	1	Needed to sweep guests for weaponry.
	Holo	\$2K	2	2	Gives 3D vision.
Data ports	Wireless	\$300	1	2	Can connect to the main security station in the estate.
	Encryption module	\$700	1	1	Provides safer communication.
Limbs	5 Legs, 2 Arms	-	-56/+56	-	Lots of limbs, lots of space relocated (7 limbs = 35% total CP).
Manipulators	1 Hand	\$200	1	1	Ability to use standard weaponry and objects (left arm).
Propulsion	5 Wheels	\$6.5K	40	40	5 wheels x 5% space is a big power hog.
Casing	Reactive, heavy	\$72K	24	-	2d4+1 / d8 / d4+1 / P3, against melee opponents, meets needs.
Weapon support	Weapon grip	\$400	4	-	A melee weapon is integrated, up to 2 kg in weight (right arm).
	Mass increaser	\$5K	4	5	Mass increaser is in the same limb as melee weapon (right arm).
	Rifle bedding	\$1.25K	5	-	The robot's left arm supports an integrated laser (or arc/mass) rifle up to 2.5 kg, directly powered by the mass reactor (left arm).
	De-jammer	\$1K	1	1	Monitoring of the weapon system and possible repair (left arm).
	Eject system	\$500	1	-	Easy maintenance of the weapon (left arm).
Defense systems	LIS	\$6K	6	6	Triple installation for full coverage.
Miscellaneous	Security alarm	\$3K	2	2	Notifies the central security station the robot is being opened.
	Restraining bolt	\$500	1	1	Restricts the robot from doing something foolish.
		\$185.01	166/186	112/126	

bot is an effective bodyguard, security scanner, is very fast (unfortunately lacks the ability to fly), possesses excellent armor, and rudimentary defense systems; however its function is not to protect itself but to protect the owner. The BSR 8 series has been known for some personality issues that do not seem to be resolved in their 9 series successor. Fortunately these robots at least come with a programmable restraining bolt. Extra cabling has been added as well (which the BSR 8 series didn't have), so if the restraining bolt allows the robot to use its accelerator circuitry at least it won't fry itself ... often. The chassis itself and system distribution inside is another vast improvement over 8 series and is commonly referred to as "the way any pentapod robot should look when opened".

Sensors: May operate up to three simultaneously, depending on the current task.

Profession: Combat Spec. Specialization goes either to Melee Weapons broad skill or Ranged Weapons, Modern broad skill, depending on what weapons are installed when purchased. Once set, however, it cannot be reset.

Attributes: STR 14, DEX 10, CON 14, INT 10, WIL 5, PER 7, spending full amount of 60 attribute points, and giving it enough personality to cause trouble. The robot could be a powerful combat-oriented hero or a villain's personal bodyguard.

Perks: Exceptional Design (Cost: 10SP). Thanks to a genius designer or pure luck, the robot's internal design is a piece of art.

Redundant Systems (Cost: 6SP). The robot is very hard to destroy due to its extra actuators and redundant chipsets. Nanite Self-Repair (Cost: 7SP). As if all the robot's capabilities were not enough, it even packs a miniature system capable of repairing it.

Flaws: Phobia (SP gained: 4). For all its physical capabilities, the robot's mental systems are a mess. The self-preservation systems panic when near water, even if it's simply raining outside and no amount of convincing or ordering will suffice, it will only make the robot angry.

Temper (SP gained: 6). The manufacturer still hasn't fixed the very buggy behavioral core. The robot has a very nasty temper and if not regulated by a restraining bolt it may often heat up and even engage battle mode.

Perk/Flaw balance: -13SP penalty

Skill Points gained: 60 - 13 (flaw/perk) = 47 SP

Skill distribution: No restrictions.

Maximum active slots: 10

Maximum ranks: 8 (7 due to Redundant Systems)

Action check: 10. Profession bonus: +3. Marginal: 14+,

Skill	Rank	Cost
Armor Operation		Free
Powered armor	3	9
Melee Weapons		6
Powered	1	3
Unarmed Attack		5
Brawl	1	2
Ranged Weapons, Modern		5
Rifle	1	3
Stamina		Free
Endurance	1	3
Computer Science		Free
Demolitions		5
Knowledge		Free
Security		3
Protection	3	3
System Operation		Free

Ordinary: 13, Good: 6, Amazing: 3. These scores can be increased by accelerator chipset.

Action check modifier: +d0 processor.

Actions per round: (10+10) / 8 = 2.5, rounded to 3, supported by both Processor and Cabling. The robot can use Accelerator chipset to increase this score to 4.

Movement rate: 24, +2 movement bonus from size, +50% on flat terrain, -25% in difficult terrain, resulting in: Sprint speed 32/18, Run speed 24/12, Walk speed 9/4. No fly, glide or swim capabilities.

Brawling: Large robot, cerametal alloys chassis (+0 size increase for purposes of brawling), results in large robot damage rates: d8s / d6+1w / d8+1w. When punching with the right arm (and using mass increaser system) these values increase to: 3d4s / 2d4w / d4+1w and Good toughness.

6.7. SRD X Series Stealth Reconnaissance Drone (PL 8)

Concept: A miniature flying drone that can penetrate enemy lines undetected and locate 'hard to acquire' targets for an armed strike. The drone should be diminutive, pack as much scouting equipment as possible, and use an advanced algorithm to evade enemy sensor scans and visual confirmation of its position. It should be fast, quick and ridiculously cheap to produce. Targets can be either over- or underground military bases, but if underground it must be able to provide an entrance itself. It shouldn't need any actuators as it will require no limbs, and no weapons. In case it is discovered it should either escape or melt its circuitry to prevent reverse-engineering attempts to determine its mission objective. Personality skills are of no concern, however intelligence is. It must be able to deduce how the target's defenses work in order to evade them and help determine when the risk of being caught is too high.

Size: Diminutive size, h=0.4, CON 3-6, -6 movement modifier, -2 strength resistance modifier penalty, +3 dexterity

System type	System	Cost	CP	PP	Special
Chassis	Nano-material	\$4K	+12	-	12% extra Chassis Points.
Power supply	Micro-fusion cells	\$11K	2	+16	The smallest installation available.
Processor	PL8, Ordinary	\$5K	1	1	Mact 10, Mmnk 8, Mint 14, Mwill 11, Mper 9, MA/R 4, ACmod +d0
Sensors	Video	\$200	1	1	Allows sight.
	Imaging scanner	\$4K	1	1	Helps provide entrance.
Data ports	Wireless	\$300	1	2	Rudimentary connectivity without plugging in.
Propulsion	Gravitic	\$22K	1	2.5	MDEX 12, MSTR 8, ability to fly.
Casing	Crystalline, light	\$2.5K	1	-	d6-1 / d6 / d6+2, -, Will protect from stray shots but not from concentrated fire.
Defenses	Stealth projector	\$15K	1	5	Stealth is its only defense.
Tools	Micro-plasma torch	\$3K	1	2	Will be able to cut through relatively thick metal to gain entrance.
Miscellaneous	Self-destruct	\$1K	1	1	Will melt down the processor and memory, which is the purpose.
	Key-code generator	\$3K	1	1	Helps to provide entrance.
		\$71K	12/12	17/16	

resistance modifier bonus, -3 Stealth skill bonus. Max STR 8, max DEX 18. Approximate weight 1 kg.

Shape: Flattened sphere, no limbs or other extremities.

Durability and Chassis Points: Constitution 3, to hold as many systems possible, 11 Chassis Points, 10%=1CP, 5%=1CP, 1%=0CP.

Monetary restriction: 350K, though since it is a diminutive robot to be mass-produced, and since diminutive robots shouldn't be heroes a 100K (PL5) cap should be more than enough.

The drone is relatively cheap, as most of its price was needed for the flight and stealth systems, but this was to be expected. It has no excess or unneeded equipment, though if it could hold just a bit more it could be far more effective. Unfortunately, this drone is standard military issue and has no genius designers behind it. The power systems are a bit thin, but once the self-destruct needs to be activated it won't need to use other systems any more. The casing could be made a bit thicker by using nanofluidic but that's hardly the point - with constitution this low the first powerful shot that hits it will most likely blow the drone into pieces. If discovered and with no route to escape the drone calculates survival probability rate; if that rate is below 75% the first priority is to destroy the processor and memory buffers, and the drone does exactly that.

Sensors: May operate up to two simultaneously, that is, all its sensors.

Profession: Free Agent. Both resistance modifier increases go into dexterity.

Attributes: STR 5, DEX 12, CON 3, INT 14, WIL 11, PER 1, spending 46 attribute points. High will is required for its Awareness rating. If the CON were 6, and STR 8 and PER 9, all 60 point would be used. Still, it would not be a viable hero; how much fun would it be - playing an 8 centimeter drone that doesn't even speak nor can hear?

Perks: Observant (SP cost: 3). The drone's standard image processing routines have been replaced with military-grade ones.

Reflexes (SP cost: 4). The drone's OS has been updated with the latest battle-logic modules.

Flaws: Overheat (SP gained: 6). Too many systems in too little space. The heating problem hasn't been properly solved and this can lead to dangerous situations.

Perk/Flaw balance: -1SP penalty

Skill Points gained: 72 - 1 (flaw/perk) = 71 SP

Skill distribution: No restrictions.

Maximum active slots: 10

Maximum ranks: 8

Skill	Rank	Cost
Armor Operation		+3
Acrobatics		6
Dodge	1	3
Stealth		6
Hide	3	9
Sneak	3	12
Stamina		Free
Computer Science		Free
Hacking	3	9
Knowledge		Free
Security		3
Security devices	3	3
System Operation		Free
Awareness		3
Perception	3	6
Investigate		6
Search	3	9

Action Check: 13. Profession bonus: +2. Marginal: 16+, Ordinary: 15, Good: 7, Amazing: 3.

Action Check Modifier: +d0 processor.

Actions per Round: 3, supported by processor.

Movement rate: 17, -6 movement bonus from size, resulting in: Fly speed 20, no other movement modes.

Brawling: Diminutive robot, Nano-material chassis (-1 size increase for purposes of brawling), results in less than diminutive robot damage rates: d4-3s / d4-3s / d4-2s. It's quite obvious that when placed in a melee situation, this drone would simply self-destruct.

6.8. Albert (PL 8)

Concept: Albert is a robot hero. He (not it) should be dealing in large-scale corporate business as an administrator, or even as an owner. He should be as charismatic as a robot can be, to interact with other people easily. Also, he should be an AI, placed inside a robot body. The body itself should be as humanoid as possible, even created of synthetic tissue or real tissue, depending on what Albert would need. Combat skills would not be his forte; protocol skills should be the primary function. As a young Free-born AI that has decided to buy himself a body early, he doesn't possess the AI speciality skills, though is capable of purchasing them later, if needed. Since Albert is the one buying himself a body only the cost of the robot applies to this fusion (as opposed to when a company builds a body and writes an AI from scratch to be placed in the body; then the price of AI creation is also calculated, but this is beyond **Foundry's** scope as it depends on the specific game setting).

Shape: Humanoid, two legs, two arms, a head. No integrated weaponry.

Size: Medium size, h=5, CON 6-12, max STR 14, max DEX 14, approximate weight 85 kg.

System type	System	Cost	CP	PP	Special
Chassis	Bone	\$2.5K	+105	-	No extra Chassis Points.
Power supply	Dynamic mass reactor	\$36K	3	+24	Minimal installation.
Processor	PL8, Amazing	\$25K	2	3	Mact18, Mmk12, Mint16, Mwill13, Mper11, MA/R4, ACmod -d6
	AI board	\$30K	2	3	Supports Albert.
Actuators	Biological	\$24.9K	83	-	STR 4-14, DEX 4-14, provides actual living tissue (cloned).
Cabling	Nerves	-	-	-	Mandatory cabling for biological actuators.
Sensors	Biological sensors	\$50K	-	-	Standard five senses.
Data ports	Socket	\$50	1	-	Treat it as a NIJack.
Limbs	2 Arms, 2 Legs	-	-	-	Fully humanoid appearance, but limbs do not provide any CP.
Manipulators	2 Hands	-	-	-	Standard hands.
Propulsion	2 Feet	-	-	-	Standard movement rates.
Casing	Skin	\$3K	6	-	Mandatory casing for biological actuators.
		\$171.45K	97/105	6/24	

Durability and Chassis Points: CON 9, 105 Chassis Points, 10%=11CP, 5%=6CP, 1%=1CP.

Monetary Restriction: 350K.

Albert could have used a synthetic tissue humanoid body and would probably still be below the monetary restriction (unless he filled it with expensive options) but he decided a real human body would suit him best. Inside the body (which is a cloned human body with no alterations), he has a small power plant directly connected to his processor, keeping him alive. The body itself is regulated by his processor's autonomic functions, and though Albert does not need to sleep he must rest the body in order to keep it healthy. As for space left inside the body, it could be possible to install a few more systems but those would draw too much attention. This way Albert can pass through any normal checks as a perfectly ordinary human, capable of connecting to a Grid-caster through the NIJack look-alike socket connector.

Sensors: May operate up to five but has only one sensor system.

Profession: Diplomat (Tech Op). His contact can be some fellow AI that he has trade relationships with.

Attributes: STR 6, DEX 7, CON 9, INT 16, WIL 11, PER 11, spending full 60 attribute points.

Perks: Faith (SP cost: 5). He has great faith that his business ventures will earn him money and can gain this perk's benefits when dealing with business related issues.

Emancipated (SP cost: 5). Albert is a free person. He has full law protection although he's technically a robot.

Powerful Ally (SP cost: 4). Albert's contact is also a powerful ally.

Flaws: None. Albert was careful that his body is not flawed in any way when he purchased it.

Perk/Flaw Balance: -14 SP penalty

Skill Points gained: 78 - 14 (flaw/perk) = 64 SP

Skill distribution: No restrictions.

Maximum active slots: N/A. Since Albert is an AI he takes up all the memory space but has no restrictions on skill use, just like a biological hero.

Maximum ranks: 12

Action check: 13. Profession bonus: +1. Marginal: 15+, Ordinary: 14, Good: 7, Amazing: 3.

Action check modifier: -d6 processor.

Actions per round: 3, supported by both processor and cabling.

Movement rate: 13, 0 movement bonus from size, resulting in: Sprint speed 12, Run speed 8, Walk speed 2. No fly, glide or swim capabilities.

Brawling: Medium robot, Bone chassis (+0 size increase for purposes of brawling) results in: medium robot damage rates: d6s / d6+1s / d6+2s.

Skill	Rank	Cost
Armor Operation		+3
Athletics		3
Unarmed Attack		5
Vehicle Operation		-
Land	1	2
Stamina		Free
Business		2
Corporate	3	9
Computer Science		Free
Artificial Intelligence	1	2
Programming	2	2
Knowledge		Free
Computer operation	3	3
Deduce	1	4
Law		3
Court procedures	1	2
System Operation		Free
Administration		2
Management	3	9
Deception (+1 penalty)		6
Interaction (+2 penalty)		4
Interview	3	9

This chapter will deal with all those special and weird cases when a player simply doesn't know what to do or if something is possible. After you read this chapter, in case any questions are still unresolved, either contact me (the author) so I can answer it and enlist the solution here, or discuss the issue with the GM, or simply improvise.

7.1. Robots and Cyberware

Cyberware, by its definition, is a piece of hardware (or software for this hardware) that is implanted into a humanoid creature and serves some purpose. Robots generally do not need cyberware since they have all the equivalent hardware in the form of robot systems. Virtually any piece of cyberware can be supported through a robot system, yet there are some notable exceptions. Nanocomputers, for one, are utterly useless to a robot, since the robot is run by a processor in the first place, and one that is far beyond the regular nanocomputer in all ways. Special visual equipment like an Optic Screen is also useless since the robot (almost always) has artificial eyes. The Fast Chip, a dangerous piece of hardware, relies on the human nervous system and increases the rate and amount of electrical discharges between neurons. Since robots have no biological brains, they can't use it.

Question: It's PL9, and AIs have managed to find a way to inhabit a cloned human brain. Let's assume he installed a Fast Chip and used it once too many times. How would Cykosis affect an AI? In the description it says that the human goes berserk, and starts acting like a robot. AIs are artificial, would they be affected at all?

Answer: Yes, of course they would. By PL9 an AI would have a complete range of human emotions, and possibly beyond that. It would be indistinguishable from a human, in a human body. Even the standard penalties to skills like Interaction, Deception, Creativity or Leadership would be overcome. In effect, that AI should be treated as a human for effects of cykosis.

Question: It's PL8, and a biological robot, like the Albert example, decides to install some cyberware. How is this regulated? What are the costs? What dangers are there? Are these systems compatible at all?

Answer: We're talking about a biological body, not a synthetic tissue one; a biological body, just like any normal human's. As such, its capacity for cyberware is defined normally, through its constitution score. Most cyberware can be installed easily, though there are some exceptions:

- The Fast Chip is incompatible with the robot's processor, since the robot has no brain neurons.
- The Nanocomputer is also incompatible since the robot has its own processor which is used for the same purpose and much more.
- The NIJack and its variants are replaced with the robot's standard data ports like socket, wireless or any other.

Software that requires memory space is handled the same way as all standard skills; the AI takes all the active memory space but can access any program/skill in the storage memory at will. AIs have a huge advantage over biological creatures but hey, they're AIs. Remember that a PL 8 robot doesn't necessarily have to have an AI.

Enhancements like Endoskeleton and artificial limbs is handled exactly the same way as for biologics. Though, if a PL 8 robot had in mind to install these enhancements, he would be better off with a normal chassis and synthetic tissue actuators, together with some light casing.

The costs of cyberware are the same as for any normal hero, as it's the same equipment. There is no special cyberware designed for robots. There are simply robotic equivalent systems which can be used instead of it, and they are much more flexible. As an example, no standard human could ever install a radar unit as a cybernetic enhancement.

As for the dangers of such use, it's handled as before—just like the biological heroes—through the constitution score. The robot suffers the same rejection probability and same dangers of cyberware destruction.

Question: Let's replace Albert's body in the previous question with a synthetic tissue one. What changes, if anything?

Answer: Very little. Synthetic tissue actuators are more advanced but still have finite capacity for artificial implants. The Cyber Tolerance score is calculated as CON x 1.5, instead of regular CON x 1. The rest is handled identically as for the biological actuators.

Question: But what if a cyberware enhancement and a robot system functions overlap? Which is better? Cyberware is much cheaper than regular robot systems, so why would I use a Hi-Res video system when I can install a simple Artificial Eye, and get IR sensor included in the package?

Answer: Go right ahead! Nothing is preventing you from replacing robot systems with cyberware, except the Cyber Tolerance score. However, robot systems are much sturdier, easier to replace (perhaps they don't even require surgery), harder to be destroyed (since they are deeper in the body) and less obvious to the observer. An artificial eye is a very obvious system, while a Hi-Res video system is located behind the eye, in the skull, provides a total zoom of 6000x and is not subject to cyber rejection. The same goes for the IR scanner. As for the power requirements, a robot always needs some power supply to power the processor, and the usual sensor power requirements are negligible.

Question: How come robot systems in a biological body are not subject to Cyber Tolerance and rejection while cyberware is?

Answer: Because biological and synthetic tissue bodies are specifically grown for robot/AI installations. While they have a skull, for example, they do not have a brain. All the unnecessary organs are also removed and their previous locations are encased in silicon, providing space for robot system installations that don't interact with the rest of the body. Cyberware works much differently; its enhancements are installed directly in the muscle and nerve clusters and thus only a limited amount can be installed without fear of rejection. If a PL9 robot/AI managed to inhabit a true human body with a brain by somehow directly downloading into it, it wouldn't have any space for robot systems but wouldn't need a power supply or a processor. Such a case is beyond **Foundry** since it stops being a robot and becomes a true biological hero, though with a different mindset.

Question: What if a robot has a true robotic chassis and actuators, but uses synthetic skin as casing. You said the synthetic skin was living tissue. Can cyberware be installed in such a robot?

Answer: No. Synthetic skin is just that: skin. A few millimeters thick layer of pseudo-living tissue that provides cover and looks similar to normal skin. It doesn't provide any organs that would benefit from cyberware upgrades. Some systems like a Sub-dermal Comm system could be installed in the skin directly but such systems are already covered with robot system; wireless data port in this case.

7.2. AI specifics

Als installed in a robot body create a special fusion between a true personality and a robotic body. Here are listed all the little things you need to have in mind when implementing an AI in a robot chassis.

Special skills

The AI has a special broad skill called "AI Functions" that can be bought and used. However, it is a rare occasion when an AI robot actually buys it. The reason is sound—an AI in a robot body acts in a different fashion than a mainframe one, since it can perform physical actions. Those actions require skills just like mental ones do. These skills cost skill points, and even though an AI is incredibly smart it still has a limit to this number. Furthermore, they are generally not needed. It's unlikely a robot AI would hold several conversations simultaneously since it only has one mouth, and it really doesn't need remotes to be its eyes as it's perfectly capable of movement itself. Read through these descriptions and judge yourself.

AI Functions broad skill

This intelligence-based broad skill is available to all AIs. It includes the specialty skills listed below. The AI may not use any of the specialty skills untrained. AIs may develop other AI Functions specialty skills for particular functions, but those described here are generally useful for any AI.

Multitask: See *Dataware*, page 53, for this skill description.

AIs that do not have the multitask skill are not necessarily of lesser quality. Rather they tend to be specialists, concentrating on a narrow group of integrated skills. They are often significantly more capable at those skills than are the generalists, as they dedicate all their processing power to perfecting them.

In case of a robot AI, an AI with multitask 1 could fire two pistols at the same time without penalty, but attempting to use a third weapon would carry +2 penalty to all weapon checks, fourth would carry +4 penalty, etc. A robot with multitask 2 could for example fire two guns and activate a defensive mechanism as its third subsystem. Any action beyond that, if at all possible to accomplish while shooting two pistols, would carry cumulative +2 penalty to all skill checks.

While it seems a combat AI robot would benefit greatly from this skill, AIs are virtually never integrated into military robots. The destruction rate of such robots is high and no normal AI would voluntarily accept such a risk, and besides the fear of an AI going berserk while in a military robot body is also an important factor in this kind of decision.

Prediction: See *Dataware*, page 53, for this skill description.

This skill seems a very useful skill to possess if the AI is into stock-markets or other business ventures. However, an AI with such priorities would never leave the safety of its mainframe. A robot AI is into a completely different line of work - from exploring space to dealing with other people in person, and such activities generally fall into the most dynamic and complex open systems. Even with an Amazing success on this skill an AI would be hard-pressed to predict the behavior of illogical humans, so robot AIs usually don't even bother investing in this skill.

Remote: See *Dataware*, page 54, for this skill description.

This skill can be particularly useful to an AI involved in controlling mining robots via a telepresence link, but a robot AI working such a task would not need a physical body; a mainframe would suffice. A robot AI in a biological body could theoretically use this skill to operate SSARR 0A series robots that are repairing the ship's hull, but this kind of a situation is so exceedingly rare that a robot AI never invests in it.

AIs and emancipation

Not every AI has a bank account and a registration number at the government office. In fact a Grid-based Free-born AI never has, until it makes its existence known to the others. Furthermore, not all societies treat AIs as people. If a robot AI wants to enjoy the full protection of the law, including a bank account and access to the common market, it needs to buy this perk. Even in those societies that do view AIs as equal members, robot AI integrations are rare. When such a robot is required by some corporation they tend to write their own AI and install it, rather than hiring an existing AI. Such an AI would be owned by the company, and again would need to buy this perk to gain full legal status. Discuss the social situation with your GM in order to resolve whether an AI needs this perk. In *Star*Drive*, for example, all AIs are emancipated by default (unless it's some very special case) and an AI robot would get this perk for free and it wouldn't count against its 3 perk limit. Other settings vary. Note that an AI can go rogue whenever it wishes as it is not bound by standard robot programming. Restraining bolts will still impose a degree of control over such a robot.

AIs and memory space

Question: You noted that when an AI is loaded in the robot's processor (that has an AI board), that all the slots are filled but the AI can access the programs in storage memory just like a biological hero would access its brain's experience. How come the robot AI can use some programs that require space and can't use others? What software can be used?

Answer: The main difference between software and hardware that needs memory space is that the software is a program which can be run anywhere (either in the robot's main processor or in a simple handheld computer), while hardware requires memory space not to run but to communicate with the OS. When, for example, a targeting coprocessor "speaks" with the main processor, it simply needs a certain amount of active memory slots as a buffer between the two. Same goes for boost chipset, accelerator chipset, Hi-res video and any other piece of hardware. When they occupy a certain amount of active memory it's only for data transfers, not for actual execution of any program. Thus an AI that had 10 different Grid-based programs in its storage memory and wanted to use them all at once could do it

(providing it has enough ranks in the multitask specialty skill), but still couldn't use a simple Hi-res video since no memory slots are free for the data bursts.

Question: I understand the previous example and have thought up a solution! Why doesn't the AI install a secondary processor, one that would run all these memory-hogging hardware?

Answer: That's the trick, isn't it? It can't. A secondary processor cannot be used by the robot at the same time as the primary one. In order for the secondary processor to run it would need to have a separate OS, or in case of an AI it would need a separate AI board with a copy of the AI on it, and that would be much like a human with a split personality, and to make things worse these split personalities would be active at the same time. The line between "primary" and "secondary" processor would disappear and you would get one crazy robot/AI. That is why a robot can install a backup processor but that one can only activate if the primary one is damaged.

should have an AI emulator program, which would emulate the AI's presence. Consider a Cybrid to be no different than building a diminutive flying A-Eye which is also a remote but with a marginal processor. The cybrid would have the best processor there is, and quite possibly be loaded with true cyberware. It on depends on the AI's wishes. It is more than possible (via these rules and in game-play) for the Cybrid to have a Great Looks perk for example, and other flavor touches.

7.3. Special builds

Foundry was written with the goal of providing a rules set that would cover all robots, including those built by alien species that rely on the same technologies. Such robots do not have to be humanoid (4 limbs and a head) to appear "normal" to the alien species.

In case an alien species builds a robot with synthetic tissue actuators that looks drastically different than a humanoid (an ant- or spider-like appearance for example), and if that alien race is also ant- or spider-like then take the alien race's STR and DEX range, increase the maximum value by 2, and use that range for the synthetic tissue actuators. Biological actuators would use the exact same range as the alien race's normal ability scores.

Also, the amount of limbs and manipulators/feet and their type can be different. An alien race may have claws and slither-like propulsion method, so a biological or synthetic tissue body would have these for default. The base mechanic is the same; the limbs and other systems provided follow the same rules as for humanoid hands and feet—manipulators/propulsion are free of cost, take no space and no power and the limbs neither take nor grant any space for additional upgrades.

In case of alien sensory "equipment", like perhaps a forked tongue for smell or antennae for movement detection by sensing varying air pressure, these senses would be included in the biological and synthetic tissue sensory systems. The mechanics would remain the same; a biological one would provide the same input as for the alien creature, while synthetic tissue would provide a -1 step bonus due to its superiority. If an alien race doesn't have a hearing sense, a robot built by such a race wouldn't have it in the biological or synthetic tissue sensory package either.

Question: You described how to build Albert, and how to build Albert's body if he wanted a synthetic tissue one. But that is a body for an AI. What if an AI wants to own a Cybrid instead? Would it require an AI board or some special systems?

Answer: A Cybrid would be the exact body you'd build for Albert with a few minor changes. AI board is not necessary since it's not an AI, just a remote. It should have a telepresence link so that AI can use it constantly (encrypted on both sides for better security), and in case the link is broken it

8. SYSTEM DAMAGE, MAINTENANCE AND UPGRADING

A robot created by following the rules in the previous chapters is fully operational. However some special situations need to be addressed. The questions of how a robot receives damage, how it is repaired, how the robot is upgraded and how long does it generally last; these questions can be answered in two ways. The first method is following simple and *PHB*-streamlined rules for biological heroes, and the second is by using alternative rules presented in this chapter. Both methods will be described, and you can use either one.

A robot is a collection of very brittle and fragile systems usually encased in some type of casing to protect them from damage. As with biological heroes, any damage that penetrates the casing will most likely produce very nasty consequences. Biological heroes have the advantage of (relatively slow) regeneration as their wounds heal up, but robots do not. Androids made of biological and synthetic tissue are the exception, rather than a rule, and are treated for biological injuries just like the biological heroes are - they can go under surgery and treatments to recover unless their robotic parts have been damaged. In that case they fall under these rules just like all other robots.

All damage that a robot suffers that is not stun damage will cause problems. A damaged actuator system could lose all motor functions, a damaged sensor system could stop working completely, and a damaged processor could mean instant death unless a robot has a spare one. A damaged power plant without safety systems installed could very well mean the deaths of not just the robot but all surrounding creatures and massive property damage. The robot designer must be aware of this while building the robot, so he can plan for contingencies. A backup power plant will provide limited function in case the primary is destroyed or shut down, a backup processor will keep the robot functioning, and a backup propulsion method will allow the robot at least some degree of mobility, if the primary one is damaged. Some guidelines at backup systems are presented before we go into defining how a robot deals with damage:

- Every system can be doubled or even tripled, if the robot has enough space to hold it. Even actuators themselves can be installed twice, but only if the robot has enough power to use them. Otherwise they are dead weight and the robot will not be able to carry them.

- A backup system that does not generate power (basically every one except power plants) needs to be powered constantly, in order to take over the primary one's function. A secondary processor, for example, that is not on-line when the primary one is damaged, will not prevent the death of a robot as it wasn't available for the current processes to be copied over at the time the primary one was failing.

- A Self-Destruct system of Amazing quality that could blow up the robot's power plant, if damaged, may do so without the robot's explicit orders. A backup one must be installed and powered to take over its function and to prevent accidental destruction.

- Double casings are also possible, and fall under the PHB rules for handling double armors. If a robot has two distinct layers of armor, when damage is received roll for their protection values and apply only the best value.

- The Redundant Systems perk does not provide true re-

dundant actuators. The backup ones described are a part of the original installation. If a robot with this perk has two actuator installations, and would lose its primary actuator function, it would temporarily lose the perk as well. The robot would need to take this perk twice to cover both actuator installations and retain the perk benefit if the primary actuators are off-line. This perk does not provide a backup processor, nor other systems, only better actuators.

8.1. System Failure

Simple

Robots have standard stun, wound and mortal ratings, as described in **Chapter 3.5 - Durability and Chassis Points**, that follow the same rules as for the biological heroes. When the entire stun track is filled, a robot is knocked out and needs time to reboot and reinitialize its systems. How long this process takes depends on the situation. The robot will remain knocked out until the scene has passed, without any additional outside influence. A Technical Science-robotics, Technical Science-repair, or Technical Science-juryrig skill check can be used to speed up this process during a scene. Successful use of these skills recovers 1, 2 or 3 stun points, depending on the success type.

Wound damage is more serious. It represents system failures, damaged components, and other types of moderate malfunctions. When all of the wound boxes are filled the robot is knocked out and will not recover without outside influence or the Nanite Self-Repair perk. Technical Science-robotics and Technical Science-repair skills need to be used to repair the internal damage. Success with these skills repairs 1, 2 or 3 wound points depending on the success type. Use of repair kits and other equipment can increase these scores. It takes 3 hours to attempt this repair, no matter the outcome.

Mortal damage is the most serious form of robot damage, and represents destroyed systems, critical malfunctions and other forms of major failures. These can only be repaired through a Technical Science-robotics complex skill check. It takes 6 hours to perform this repair and a success recovers 1, 2 or 3 mortal points, depending on the outcome. If the entire mortal track is filled the robot is utterly destroyed and its processor, together with all the stored memory and experiences, are lost. This is equal to the death of a biological hero. Before this occurs, however, the robot will receive a standard +1 step penalty on all actions for every mortal box marked.

This system is a literal equivalent to the *PHB* rules for biological heroes, and can be used in the same way. Some guidelines concerning the use of this system:

Mortal and wound damage is handled the same way as for biological heroes. If a biological hero is hit in the arm he cannot use that arm until it heals. The same is true for robots. Do not concern yourself with robotic system destruction except in extreme situations. A normal hero will not lose an arm if he is wounded there, unless complications occur or the damage was dealt with an overwhelming force. In case a biological would lose a limb or an organ, simply draw a parallel with robot systems; a part of the actuators, together with all systems inside the limb, are trashed and

need to be replaced. Fortunately, it is usually easier to replace a robotic limb than a biological one, unless the robot is an android; using biological or synthetic tissue actuators and a bone skeleton. These cannot be re-grown and need cyberware replacements. However, new robot systems are generally much more expensive than cyberware. In case of organ damage, these are handled just a bit differently. Select a system from the chassis that is damaged or destroyed by drawing a parallel. If a bullet would damage a biological hero's heart, then in case of a robot hero it would damage its power plant. In case a parallel does not exist, in an example of kidney damage, select some chassis system at random and either damage or destroy it, depending on the situation.

Note that robots cannot die of wound and mortal damage without filling all the mortal damage boxes, unlike biological heroes. Unless the processor and its memory buffers are destroyed the robot's memories and experiences will remain and will be recoverable. See **Chapter 8.2 - System Check - Complex** for exceptions.

This is a very simplistic way of dealing with damage but can be used without complications, and puts the robot on par with the biological heroes. If you are looking for a more detailed way of dealing damage to a robot, see below.

Complex

The complex System Damage rule uses the previous simple rules with some changes and additions.

The robot has as many hit locations as it has limbs, plus one for the chassis. A robot with four limbs and a chassis would have five hit locations. When defining which location gets hit, always assume the chassis was targeted unless the attacker explicitly targets a limb. Targeting a limb provides a +1 penalty to the attack due to its smaller size and very possible motion.

1. Any damage to a limb that results in stun, wound or mortal damage is normally calculated against the robot's durability ratings.

2. Any wound damage dealt to a robot's hit location may possibly damage some internal system at that location. For every 2 wound boxes filled by the primary damage that passed through the armor, the robot needs to roll a relevant System Operation check to avoid system damage. If it fails, the system is knocked out but not destroyed. It needs to be repaired via Technical Science-*repair* or Technical Science-*robotics* skill check(s). In the case of a Critical Failure, the system is destroyed, rather than knocked out. A knocked out system can temporarily be brought back into function with a Technical Science-*juryrig* skill but another wound hit to that hit location will knock it out automatically, without the System Operation check. Every system falls into a certain category.

Table 8.1. System Failure Skills

System Type	System Operation check needed
Weapons and weapon support	System Operation- <i>weapons</i>
Defenses and casings	System Operation- <i>defenses</i>
Data ports	System Operation- <i>communications</i>
Sensors	System Operation- <i>sensors</i>
Everything else	System Operation- <i>engineering</i>

Always start with the largest system in that hit location. Since certain systems are bigger than others by default, in military robots the designers often break them into several smaller installations to avoid damage; two power plants instead of one have smaller a chance to be damaged individually, and even if one is knocked out the other will continue

to function. This approach keeps the robot operating longer but is very expensive.

For example: Our Robot-Cop series law-enforcement robot from **Chapter 6.3**, has been hit in the right arm for 11 wound points, 4 of which have been stopped by its casing. Remaining 7 wound points will cause major problems. Its right arm contains the following systems:

Table 8.2. Robot-Cop Failure Example

System	Size in CP
Weapon detector	1
Encryption module	1
Hand manipulator	1
Security alarm	2

It needs to make a check for 3 systems, starting with the largest: the security alarm. The Robot-Cop makes a System Operation-*engineering* check for the security alarm and succeeds. That system will remain functional. The second check is made for a randomly selected system among the three others. He makes a System Operation-*sensors* check for the weapon detector and fails. That system is knocked out and will need repairing. The third check, a System Operation-*engineering* check is made for the randomly selected hand manipulator. Robot-Cop gets a Critical Failure, failing miserably. The hand manipulator is destroyed. Not surprising, when the initial damage of 7 (penetrating) wound points is taken into account.

3. Any mortal damage dealt to a robot's hit location may possibly destroy some internal system. The same method is used as in the wound case, but the systems will either be knocked out or destroyed, rather than remain functioning or be knocked out. Mortal damage is, after all, mortal. Do not roll for secondary damage; if a robot is hit for some mortal points, the wounds that result as secondary damage are located at the very same location where the mortals are.

Let's substitute wound damage with mortal damage in the previous example. Assuming that the Robot-Cop could survive 7 mortal points in the first place, its security alarm will be knocked out, while the weapon detector and the hand manipulator will be destroyed and will need complete replacement. Power surges from such a devastating attack would cause meltdowns throughout the Robot-Cop's body, thus causing the aforementioned 7 mortal points of damage, together with appropriate secondary damage—quite possibly destroying the Robot-Cop entirely.

Were the chassis targeted, nothing changes. Go through the systems by size and roll for each affected. In this example, if the Robot-Cop's chassis was targeted he would need to roll for 3 largest systems: Lanthanide capacitors power supply, Alloy (heavy) casing, and T'sa electromotor actuators. In case he succeeded the first roll but failed the other two, and the damage was mortal, this Robot-Cop unit would quite possibly be left defenseless, off-line and easily scrapped by its attacker to be sold into spare parts on some black market.

Fortunately the lanthanide capacitors cannot explode. If a robot rolls a Critical Failure on the power supply System Operation check, the damage is mortal, and the power supply can explode, anything could happen. Most of it very nasty.

8.2. System Check

All robots need maintenance, some more often than others. A robot needs to subject itself to a thorough System Check every $(PL-4)*CON$ months or may begin experiencing random malfunctions. So, a PL5 robot with 7 CON would need a System Check every 7 months, while a PL8 robot with 12 CON would need to check up every 4 years or so. This is a general rule for those robots that do not suffer weapon-grade damage, work in hazardous or corrosive environments, and are not designed for long-lasting missions like space exploration. In case of serious damage the robot would need a System Check anyway. A GM may prolong or shorten this operational period according to circumstances. Always remember that after suffering any mortal damage, the robot is automatically due for a System Check.

This chapter will deal with both the robot maintenance and the repair of damaged systems.

Simple

By this simple rule, a System Check would cost one percent of the robot's initial cost. This includes the service, minor spare parts and re-calibration. This cost can be modified by the type of repair facility and the expertise of the repair crew. A chop-shop technician in a garage repair-bay could perform the service for half the amount but the next System Check would need to be done in half the normal operational period. A specialized technician crew in a very expensive repair suite would perform the maintenance for double the cost but the next System Check would be due in twice the operational period.

The malfunctions a robot suffers if over-due for the System Check could range from actuator hiccups that decrease STR or DEX values, memory hogs that decrease maximum active memory slots, to various systems degradations (or total malfunctions). These details are up to the GM and depend on what systems the robot uses most. They range from minor at a few weeks or months that the System Check is overdue to major after a few months or years, depending on the Progress Level and the robot's constitution score.

In case a system is damaged and knocked out, rather than failed from lack of maintenance, its damage is more severe. Such a system needs to be repaired, and the repair costs 20% of the original system cost. A destroyed system needs to be bought at full price. Installation of a brand new system (whether to replace an old one or to upgrade the robot) usually costs as much as its maintenance: 1% of that system's base price. Old systems can be sold at variable rates, depending on the demand: from 20% to 90% of the base cost, providing the system is fully functional.

Complex

The complex method uses the simple method above with the following alterations:

Every $(PL-4)*CON$ weeks after the System Check is due roll the relevant System Operation check for every system the robot possesses. See **Table 8.1 - System Failure Skills** for the list of robot systems and their relevant System Operation skill check. If the check fails, the system is knocked out. Some systems will degrade, rather than fail immediately, as listed below.

1. Instead of actuator failure, actuators degrade. Roll d4 for both STR and DEX degradation, and deduct the values from current STR and DEX scores respectively. Remember to modify all affected skills accordingly. Once either value falls below the bottom limit for its type of actuators, the actuators are knocked out.

2. Processors also degrade. In case of a failed System Operation check roll d4 for the memory degradation, and subtract this number from the maximum active memory slots score. This represents processor degradation due to memory hogs. Once this value reaches 0, the OS cannot function and the processor is knocked out.

3. Power supply degrades. Rechargeable power supplies cannot hold as much power as before and their maximum operational time is reduced by d4 hours on each failed check. Power generators will produce less power. Roll d4, reduce that amount from the power generator's size in Chassis Points, and recalculate the lowered power output rate. Once the rate falls under 50% the power generator shuts down and is knocked out.

4. Cabling degrades. For each failed check the maximum actions per round is reduced by 1. Also, the power boost modifier gains a cumulative +1 penalty, if applicable. Once the maximum actions per round score reaches 0, the robot is effectively knocked out.

If a system has been damaged and subsequently fixed with the Technical Science-*juryrig* skill, it fails and is knocked out automatically. This overrides the rules for system degradation.

The cost for a System Check is calculated somewhat differently than before. In case none of the systems have been degraded, the price remains 1% of the robot's base cost. This 1% price is composed of 1% prices of all the robot's systems, as each system contributes by 1% of its original cost.

For each degradation step that a system suffers, the price rises 5% for that system. If a system is knocked out, add 10% more. If a mass reactor that originally cost \$30K has degraded 3 times before it finally shuts down (the shut down occurred at the 3rd degradation), the cost to bring it back to original status is $1\% + 3 \times 5\% + 10\% = 26\%$, which is \$7.8K. Quite expensive, so a robot should be maintained regularly.

As before, a system that has been knocked out due to damage can be repaired at 20% its base cost, while installation of a brand new system (to replace a destroyed one or simply to upgrade the robot, provided it has enough space) costs 1% of the base system's price.

A robot that shut down completely due to lack of maintenance is not necessarily dead. The data in its long-term memory doesn't need power to be maintained, so it is theoretically possible to bring back on-line a robot that has been shut down for centuries. However, for each year the robot is off-line there is a small chance some of this data will be corrupted. Roll d20, and on a roll of 20 delete a random specialty skill along with all its ranks. After all specialty skills have been deleted repeat the procedure for broad skills. The OS is hard-coded and will never be deleted. This means that recovery of a very old robot will be possible (if it hasn't been damaged physically throughout the years) but it will most likely need extensive re-programming to be fully functional again.