

TWILIGHT SECTOR

SPACE OPERA¹⁰

TECHBOOK: CHROME



John D. Lees

TRAVELLER



*An alternative take on cybernetics,
with rules for bionics and other
bio-replacements, cyborgs and
cyrgeware thrown in for good
measure.*

TECHBOOK: CHROME
Twilight Sector

TWILIGHT SECTOR

Techbook: Chrome

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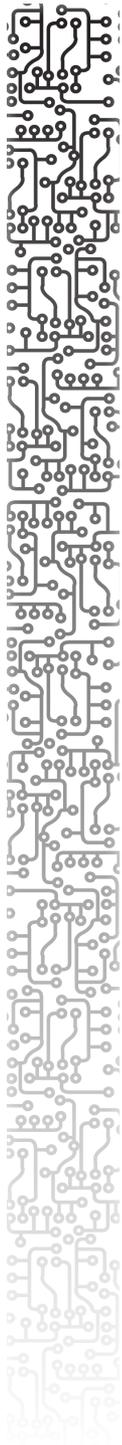
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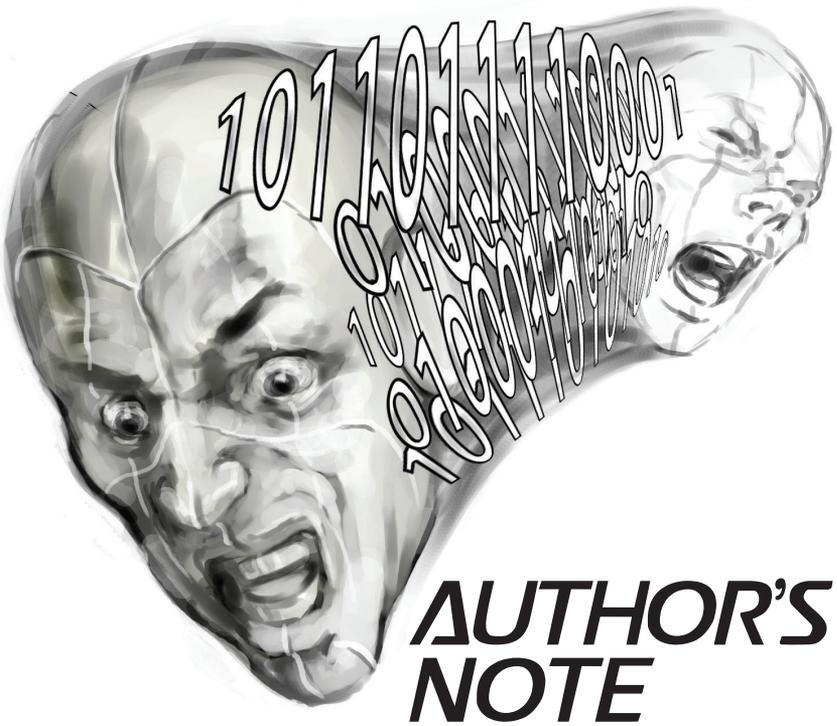
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Cybernetics, it could be argued, were pioneered by Edgar Allen Poe in his tale “The Man That Was Used Up” (1839) — a story about an old soldier who was literally composed of various prosthetics. By the Second World War, science fiction stories included many (as-yet undefined) cyborgs such as C.L. Moore’s “No Woman Born” (1944), in which a famed dancer named Deirdre is given a new robotic body and must learn to adjust to her new state of being. By the 1960s, the term “cyborg” was itself coined by Manfred Clynes. The 1970s television series *Six-Million Dollar Man* popularized it further (and his “bionics” are actually cybernetics in this book, while the word ‘bionics’ has been revived and separated from cybernetics here). But the heyday of cybernetics came with the Cyberpunk revolution of the 1980s. Out of this rich history is drawn **Techbook: Chrome**, offering the **Traveller** system an alternative take on implants (cybernetic or bionic, as well as a new kind, cyrgeware) and cyborgs.

As with all Terra/Sol supplemental texts, this book presents its material using the **Twilight Sector Setting** as a basis, but the rules and technology herein are suitable for a wider range of **Traveller** settings. Referees can easily strip out the nominal setting information and adjust these rules to their own settings and campaigns.

THE SOCIAL ACCEPTANCE OF CYBERNETICS IN THE TWILIGHT SECTOR

Cybernetics and *Bionics*, while considered something of an anomaly in the social fabric of the **Twilight Sector Setting**, are neither actively suppressed nor made into a complete social anathema. Although it would be a mistake to claim that these implants are fully embraced however. The term used for techno-implants of all kinds is “*chrome*” and one who has them implanted is a “*chromer*.”

The Larger Issue: Deviation from the Norm

The **Twilight Sector Setting** envisions a human-centric universe, and while there are definitely aliens (transluminal drive technology came initially from alien artifacts), there are no contacts with living aliens in the setting (of which the public is aware at least). But the Twilight Sector Setting *has* mutants, who deviate from the basic human genetic model in non-trivial ways. In fact, the setting boasts *two* types of mutant populations: **Scientifically Induced Mutants (or SIMs)** which first began appearing in the late 21st century, and **naturally occurring mutants**, who are born (often from baseline parents) with random mutations. The latter have become the crux of the problem, stemming from a sudden rise in natural mutation noticed by the 27th century (about three centuries before the standard setting). This rise of “natural” mutants, both in percentages of the population as well as appreciable numbers, has created a backlash among the normal human or “baseline” population fed by fear and paranoia. In the **Twilight Sector Setting**, this backlash sets the stage for a major war (although there are good reasons to dismiss this, the conflict being merely cover for a land-grab by the Expansionist States), as well as smaller dramas (hate crimes, public riots, mutant-rights efforts) which can drive the narrative of individual tales.

Ironically, human genetic engineering is both commonplace and accepted in the **Twilight Sector Setting**. To a point. When they were first developed, SIMs were not just accepted, but enthusiastically embraced. But when the rise of natural mutations began to get broader notice, even SIMs began to feel the backlash of the baselines. The fear and loathing of the populace towards natural mutants branched into a general distrust of anything that deviated from the

Doctor Techlove, or how I stopped Kvetching and learned to embrace the Chrome

Generally game settings either wholeheartedly accept, or vilify and reject, such things as cybernetics, depending on the atmosphere and tone that the designer wants to present for the background. From an entirely metagame perspective, the approach to cybernetics and bionics in the *Twilight Sector Setting* is a deliberate attempt to create a “middle path” with great flexibility.

The basic stance of society ranges from guardedly neutral to slightly hostile depending on the needs of the referee and the campaign. There may be “pockets” where the general state of “baseline paranoia” pushes this in either direction (open toleration or condemnation). At **Terra/Sol Games**, the campaign is the thing, and this approach best-allows Referees to make these kinds of choices for their *own* games.

norm. Paradoxically, that “baseline” still has no problem in tinkering with the genetic predispositions of their unborn offspring, rooting out occurrences of genetic diseases, even making (idealized) cosmetic modifications to produce desirable traits. In the ***Twilight Sector Setting***, most of the Trillions of human beings alive are technically SIMs, although only a small percentage of the overall population is so labeled.

What does this have to do with Cybernetics?

While there is no genetic change that takes place, chrome still activates the same kind of fear-response as mutation. Like SIM technology, the use of techno-implants to enhance capabilities is seen as propelling those who use it much too far from the baselines and far too close to the mutants. The psyche of baseline culture in the ***Twilight Sector Setting*** is the predominate culture of humanity, caught between fear of the mutant (and the eventual decline of the baseline species) and the natural desire to seek out advantage (acquire genetic superiority through SIM technology or practical advantage through cybernetics).

There is a kind of ‘counter-pressure’ from society that rejects anything which makes people “better than” the majority of the baselines (Mutation, Cybernetics, Psionics). Does this ‘counter-pressure’ present itself as pitchforks and torches or public shaming? Generally not. Although natural mutants get the raw-end of the stick as usual, and in some areas they are ruthlessly exterminated or get forced into second- and third-class citizenship status. This is much less pronounced for those who have visible cybernetics. The fact that some of these implants are conscious choices is balanced against the fact that they

Techbook: Chrome

are sometimes also the result of accident or injury. Given that full bio-replacement is far more costly than cybernetics, to reject chromers out of hand is both unrealistic and unfair. Still, it happens just that way for all too many, especially as the cybernetics get more extreme or there are many implants. Welcome to low-level mass hysteria and irrational social prejudice, facts and reason need not apply. Still, the humans of the 30th century scratch their heads in wonder over those differences we 21st century primitives obsessed over while retaining severe (and unrealistic/unfair) prejudices of their own.

Because of what drives these fears (inadequacy and a fear of becoming obsolete), the use of bionics (part organic/part non-organic) as opposed to cybernetics (fully inorganic) is immaterial. The *effect* of becoming “superior” is the key point that triggers the response. The more obvious the chrome is, the more pronounced this pressure will become. Someone who has multiple accessories, and demonstrates that they indeed have a significant “advantage” over those who do not, will be treated as SIMs (-1 Social Standing), which they effectively have become.

For “Cyborgs” (human brains inside of robotic or vehicular shells) this pressure comes in far more subtle forms — like being snubbed, mistaken for a ‘robot’ or simply being avoided in public (-2 Social Standing). In fact, it is not uncommon for cyborgs to just “pass” as a robot and avoid the trouble that inevitably comes from detection.

Different Subcultures, Different Rules

One of the advantages of the model used in the Twilight Sector Setting is that it is very plastic. While an individual Referee can (and should) adjust the public’s toleration as mentioned in the previous sidebar, they can also set up different subcultures with very different responses to the same stimuli:

- ✦ **Spacers** for example, are a semi-itinerant population of station workers, starship crewmembers and others who work and live in the shady sections of space. To a spacer, cybernetic/bionic modification is an survival edge, and sometimes that edge will not only save the implantee but those around them. They have a high toleration for chrome and chromers.
- ✦ **Tinkers**, a group of familial-based population of wanderers and nomads, might have strong toleration for other Tinkers with lots of chrome, while they share the same level of *int*toleration for those outside of their bands.
- ✦ **Mutant War Veterans**, while not a generational sub-culture, are still a sizable population in the Twilight Sector Setting. With so many mangled and injured in the war, the level of tolerance among these veterans for chrome would certainly be far greater than most. Driven by experience, they would also be more susceptible to the Spacer’s logic of the benefits of cybernetics/bionics.

SOCIAL ACCEPTANCE IN OTHER SETTINGS

Individual Referees are free to determine for themselves the acceptance of chrome in their own campaigns, especially homebrew settings. Some things to keep in mind however:

- ⚡ Chrome is expensive, this means that in settings where people either do not care about, or fully embrace chromers, there is still going to be a distinction between the Haves and the Have Nots. There might also be a more active secondary market for cybernetics in such places (lower cost & reliability).
- ⚡ Cybernetics or bionics might not be appropriate for the setting you have (or want to create). This can be easily rationalized by having certain (undesired) technology simply 'not pan out' for some reason. For example: don't like cybernetics? This technology might be stymied due to the in-availability of sufficiently low weight alloys/high-durability plastics, or their might be problems with the cybernetic interface itself, or with the rejection meds that are required for so much artificial material placed into the body. Don't like Bionics? The whole 'piecemeal creation' of limbs using cultured frames, similar to synthmeat in *Setting Update Beta*, pg. 22-23, could be problematic for complex systems, or spontaneous mutations during tissue growth cause these tissues to fail too often to be viable commercial goods (so they are possible, but not common). In the end, pick whatever tech you think works best for your setting, then justify including/discounting that technology backwards (as in: "I only want bionics, and here's why...").
- ⚡ Open acceptance of chromers will mean that chrome is going to be more common. This is not necessarily a bad thing, but it should be kept in mind when characters face opponents (more likely to have cybernetics) and interact with NPCs (who might have allure packages or other social-interaction based cybernetics).
- ⚡ A rejection of all chrome by society will push the process into the underground, forcing those who develop this technology to operate in the shadows. This will mean that more components will have to be purpose-built, and fewer resources will be on hand. There will be no "standard" designs and some might be harder to find than others. Also, those techno-implants which are relatively undetectable will be more commonplace than showy or obvious examples.



TECH-LEVELS IN THE TWILIGHT SECTOR

The concept of tech levels in the *Twilight Sector Setting* is more porous than that of a generic *Traveller* setting. The Setting isn't quite as far-flung nor as ancient as some other *Traveller* settings. Planets are connected tightly by bonds of trade; so while individual tech levels still mean something, the worlds of *Twilight Sector Setting* tend to fall in a limited number of categories.

Maintech worlds are those within the range of TL 9-12. They (and their goods) are known as *maintech* because there is an effort to harmonize the interfaces, connectors and other components as much as possible. This is a conscious choice, driven by self-interest and utility. Thus, a TL 12 weapon system (for example) can find *some* replacement parts on a TL 9 world since both are *maintech*. With locally made goods, a TL 9 tech would not be able to conduct a complete overhaul, but they could perform basic maintenance. That crate full of TL 12 goods that came in last week however might have exactly what is needed. Since it is *maintech*, the TL 9 techie can even handle the parts that need to be swapped out in an overhaul with these imported trade goods.

Background Material

As one goes lower down the TL scale of *maintech*, the reliance is more and more on such 'imports' and as one goes higher, there is often a great deal of planetary production designed in part or whole for export off-world. Some *maintech* worlds are TL 9 or 10 in all but one or two industries where they have retained (or developed) specialization. These are sometimes called *sliptech* worlds, since they are poised on the edge.

Retrotech worlds are TL 8 and lower, and most of them deliberately eschew technology (for religious or philosophical reasons). In some cases, such as the Orion Confederation, this is allowed under the laws respecting strong local governance and/or religious toleration. In others, it is socially ingrained, so that even if these goods are present they are simply unused (like 21st century Amish).

A few worlds could be considered *retrotech* because they have few or no native production facilities above TL 8, but are still awash in *maintech* parts due to active trade routes. At times, natives are often shocked and dismayed to discover that economics have forced them into this nebulous zone (which is only *maintech* so long as the trade routes remain constant). Once a world spirals down this far, they might become **Backwaters** (not *retrotech* by conscious choice, but *retrotech* nonetheless) if they drop off the regular cargo routes (until then, they are *maintech* despite the lack of local production).

In a similar situation are many **Fringer** worlds, which lie outside of the official boundaries of the interstellar nations and thus are hard to get to and/or outside of the regular trade routes.

High Tech worlds are TL 13-15, but even here most of the technology sold in the marketplaces found on these worlds are TL 9-12 *maintech* goods. TL 13 is reserved for "fancy" gadgets, high end consumer goods. These are the Rolex watches and Lamborghinis of the setting: for sale, but harder to find and pricey. This spills over into TL 14 in some cases, but most TL 14 goods are actually 'experimental' or 'cutting edge' technology, generally not even mass-produced (with some exceptions). TL 15 encompasses the top-edge of technology, within the grasp of the interstellar governments and larger corporations, but even then as prototypes and truly unique items.

Most goods in Twilight Sector (including the cybernetics listed here) are assumed to fit the *maintech* niche, and are priced accordingly. Referees are free to determine whether or not some of these goods would be available to a particular world/system/market in their own setting and what the markup for the goods would be.

USEFUL SKILLS FOR CHROMERS

Mechanics & Engineering (Electronics) are useful skills for the primary components of TL 8 and lower cybernetics (not the interfaces, but the camera-eyes or audio-pickups for example). This is one reason that such “old” cybernetics are still on the market (and many of these cybernetics are not truly “old” at all). Some end-users feel this “simpler” design facilitates repair and maintenance (and others just appreciate the lower costs of a TL 8 Cybernetic in the TL 12-based marketplace).

Life Science (Cybertechnology) is the “The study of blending living and synthetic life” (TMB, pg. 57) in this context it deals with the basic design

Option: Some referees may want characters who wish to apply their oh-so-theoretical Science skill to at least possess (but not necessarily have to roll) some Engineering or Mechanics (or the Trade skills below) to provide them with a practical basis for all that theory.

and the practical application of cybernetics. Think of this as a general skill in cybernetics, it allows the cyber implant to be designed and built, maintained and diagnosed. Because this is a science skill, it stresses theory over application.

Life Science (Biotechnology) is the counterpart of the *Cybertechnology*-specialization within the field of biologicals (bio-replacements and bionics). Growth cultures, the proper way to grow specific parts and the DNA-manipulation required to make bionics.

Again, as a science skill, it stresses theory over application.

Space Science (Robotics) is a skill that deals with a certain amount of overlap in cybernetics, primarily the form and design of cyberlimbs (all except the interface with the biological entity) and about 85% of the design and production of cybersense organs.

Trade (Cybernetics Production) is the skill of producing (or compiling) a cybernetic component. In some ways, this is the practical portion of *Life Science (Cybertechnology)* without the theoretical aspects (or at least only the ones that are useful in the production process). It does not have the breadth of the *Life Science* specialization, and thus cannot be used for some checks (such as synching the finished limb to the chromer, a critical part of the process).

Trade (Biotechnology Processing) is the counterpart of the *Cybernetics Production* specialization specifically for bio-replacement and bionics. It involves an in-depth practical knowledge of how to run a growth facility to yield the individual limbs and organs used for Biologicals of either type.

HIGH STRENGTH IMPLANTS

What happens when a new limb has physical strength much greater than that of the user? Not as much as one might think. The higher-strength limb can perform some actions at full strength (squeezing an object in the hand for example), but in cases which involve the full body (lifting objects, which involves shoulder as well as arm muscles; pushing aside large objects, which involves many muscles over the entire body) the limb strength is secondary to the character's overall strength stat. In a few cases, when the chromer is braced properly for example (most combat skills train chromers how to do this, add in other cases at the Referee's discretion), the character can safely add some of their limb's greater strength: **add +1 to the chromer's Effective Strength for every 2 full points the cyberlimb Str is greater than their own (up to a +3)**. Note that this is not the Strength DM, but the statistic. Use this adjusted Strength characteristic to determine the appropriate DM however.

Giving that Extra Effort: Overstress

If the character is willing to cause damage to their body however, they **can** use the limb to it's full strength for some checks. The danger comes from the additional strain tearing muscles in the shoulder and back (arms), or the hips/thigh/groin (legs). If the user wishes to exert themselves in a situation the Referee feels overstress would be an issue, use the Strength of the limb as the character's effective Strength for this task and make an Endurance stat check to resist injury. **Reinforcement** (Page 30) will help with Overstress (+4 DM to test below). **Note:** Bionics are considered automatically reinforced, as are oversized limbs.

- ✦ Task: **Resist Overstress Injury:** Endurance, instant, Negative DM: difference between user Strength and limb Strength. The character who fails will take d3 Str and d3 Dex damage **and** stun damage equal to the Negative Effect of the check (which can be healed normally for stun: 10 minutes/point, see Starfarer's Gazette #1 for details on Twilight-Sector options for stun damage)

Example: *Vandra is a Str 8, End 10 character with an unreinforced Baseline Cyberlimb that she enhanced to +4 STR (12). If she wishes to squeeze something, she can use her full cyberlimb Str of 12 (for a +2 DM). She can (if braced) use her cyberlimb to safely give her an effective Str of 10 (since she gets a +1 for every 2 full points; this gives her a Strength +1 DM) without risking any damage. During the course of an adventure however, Vandra needs to get her partner out of a burning vehicle. The Referee says that prying her friend out of the wreckage is a Very Difficult (-4) Strength task (since Vandra has no Athletics (Strength) this will be a base statistic check). As she wants every possible advantage, Vandra pulls out all of the stops, using her full cyberlimb strength of 12 on the door in order to get the +2 DM.*

The check is a success (thanks to her higher Str total), but Vandra now has to make a Resist Overstress Injury Check. Her STR 12 cyberlimb makes the DM for this check a -4. She rolls a 7 +1 (END DM)=8 -4 (Negative Dm for having 4 STR over her own in cyberlimb)=4, for a -4 Effect. That means her Strength is reduced by -d3 (roll of 2) and Dexterity is reduced by a -d3 (roll of 1). She has also taken 4 points (the negative Effect of her roll) as stun damage, which comes off of her Dexterity (all Stun damage starts there).



Sometimes a man really **doesn't** know his limitations. Or those of a Mk. 23 Cyberarm. Same thing.

CYBERNETIC REPLACEMENTS

Cybernetic forms of chrome are fully artificial, generally made from lightweight metallic alloys and high-density plastic or biological ceramic compounds (known for their great beauty). Cybernetics are both functional and durable, the product of over a millennia of prosthetic design. Generally, cybernetic implants must be fitted for specific individuals, in order to match their height/weight/shape, either made specifically for them or custom modified using factory parts. Some cybernetics are even made from partially or fully organic components, a half-step in the direction of bionics. Cybertechnologists are considered artisans, and some are considered artists. Implantation however must be performed by competent medics, although the actual surgeries are now considered much more pedestrian affairs than they were a thousand years ago with specialized techniques and tools that have vastly simplified the process.

Recovery time from most implantation surgery 'only' requires 4+d3 days to avoid infection issues and allow characteristics to return to their normal levels (assuming those days are spent in adequate medical care). The user must also "work in" the new cybernetic, a task taking about d3+2 days of use (which can only be started after the 4th day of healing). Until "worked in" there is a -2 DM to all tasks while using the cybernetic replacement because of the unfamiliarity. This is partially for the chromer to learn how the cybernetic replacement works and partially for the co-processor embedded in the cybernetic replacement to learn how the chromer works).

Organic Cybernetics

While the material here presents a stark difference between bionic and cybernetic implants, the difference is more along the lines of a graduated continuum. There are some cybernetic parts made from organic materials, but these are far from the 'perfect duplicate' used for bio-replacements.

While classified as cybernetics, organic-based cybernetics are somewhat easier for human bodies to tolerate than inorganic materials like metals, plastics and ceramic compounds. Of course, there are other ways in which they are inferior to those materials (as with so many things). For the purposes of the game, the differences even out. Organic cybernetics and inorganic cybernetics are treated here as effectively the same.

Individual Referees are free to assess a +1 DM or -1 DM to specific situations if the character has made a point to indicate whether the cybernetic implant is largely/partially/solely organic in nature.

TECHNICAL DETAILS

Implantation surgeries are performed by medical techs who not only use their *Medic* skill, but also *Life Science (Cybernetics)*, while cybertechnologists use *Life Science (Cybernetics)* **and** *Space Science (Robotics)* or *Trade (Cybernetics Production)*, some have *Art* skill specializations as well (for high-end, trendy cybernetics). Normally, these personnel are assumed to perform their functions behind the scenes with solid competence, but characters who wish to do some of these tasks themselves may do so with the right skills (see “Self-Made Man” below).

Surgeries will of course have to wait for the limb itself to become available, but this is not likely to be much of a problem. One of the major advantages of cybernetic limbs and sensory replacements as opposed to biologicals is immediate availability. In a large community, really anywhere a hospital is found in the 30th century, there are a range of component parts that can be put together to create the limb. A rotation pin of size “X”, an upper arm shaft of size “Y” and so forth. While not identical, these often have a definite “similarity” of appearance with other cyberlimbs of the same make and model.

A more “custom” limb can be produced by building these components to specification rather than using a variety of modular “off-the-rack” components. Rather than adjusting pre-built components, the sub-components are built using the basic designs but specifically molded for the end-user. This only adds a few hours and a few thousand credits to the process (usually, about 10% to 15% of the cost of the limb if put together by a tech rather than self-constructed).

Why does this cost more than CharGen?

During character creation, basic cyberlimbs are often paid for, and even when not paid for outright can be ‘bought’ for far less than the values listed here; yet outside of character creation these same replacements have significantly higher credit costs. The reasons for this vary, but the overall costs are largely absorbed or spread out during character creation. The replacement might have been installed 20 years ago, and was (at the time) something of a hardship, but with the character reducing their luxuries for several years and/or paying on installments, with the occasional windfall to help shoulder the burden they got through. Insurance also might have paid for some or all of the cost even if the medical roll failed (**Tinker, Spacer, Psion, Spy** “Medical Care Coverage” charts, pg.178, **TMB** “Medical Bills” chart pg 37), or subsidies might have been involved as well. Maybe the character took a few extra jobs on the side to help cover the overage. By the time of play, these extra costs have evened out.

Cybernetic Replacements

For a bit more expenditure, a completely custom designed cyberlimb (no modular components) can be produced in d6 days and costs +25% of the base costs. These unique cyberlimbs are suitable for artistic flourishes and thus are often seen in higher-end chromers.

THE SELF-MADE MAN

The above assumes someone else is doing the work for the character, but with the right skills, PCs can make or build their own cybernetics:

- ⚡ *Self-Construction:* A character with the right skills — *Trade (Cybernetic Production)* or *Life Science (Cybernetics)* — can construct their own cyberlimb (or one for a friend) using available factory-built parts. If those parts are available, they often reduce the costs by at most only about 2.5% (if using someone else's parts, although some facilities actually charge the individual *extra* and makes them sign a waiver for indemnity) or 10% (if using self-purchased parts, this would require a license in some areas to obtain these, this will vary from place to place at Referee's discretion) of the costs of the cyberlimb. This essentially avoids the markup of the fitting specialist (and some markup if buying the parts).
- ⚡ *Kit-Building:* Producing the raw components (as opposed to a completely re-designed limb as below) with one's own production facility (see above) to turn raw materials (alloys, composites and wiring for instance) and some pre-fabricated parts (dataswitches and servos) into a cyberlimb using readily available "standardized" plans will shave 25% off the final costs of the cyberlimb (essentially, cutting into the markup of the manufacturer; the real price a manufacturer pays for these components is even lower, but the parts must be produced in the thousands or millions to get those unit prices down).
- ⚡ *Fundamental Design:* The character can save half the cost of the cyberlimb/sense (the other half is parts and equipment and surgery) by spending up to d6 weeks to design and manufacture the limb or sensory organs themselves (given 'generic' facilities to work with). This process *can* take as little as d6 days with the proper equipment and expertise, but this requires facilities far beyond that of the skilled amateurs; a dedicated cyberlimb production workshop and at least *Trade (Cybernetic Production) 2*. Thus d6 weeks should be the most common timeframe for self-designed limbs.
- ⚡ *"Self"-Surgery:* Not so much about design/build but "installing." In other words, getting someone to perform the surgery thus reducing/eliminating surgical costs (see "surgical process" below).

MANUFACTURING CYBERNETICS

The character makes a Task Chain roll with DMs based on the chart that follows (*Kit-Building/Fundamental Design*):

- ◆ Step One: **Task: Design cybernetic:** *Life Science (Cybernetics)*, Education, variable time (see below), Average (+0), use DM from Cybernetics Manufacturing Chart.
- ◆ Step Two: **Task: Build cybernetic:** *Space Science (Robotics)* or *Trade (Cybernetics Production)*, Education, variable time (see below), Average (+0), use DM from Cybernetics Manufacturing Chart.
Task Time (combined): The “Kit-Building” base time is d3x5 hours, the “Fundamental Design” on the previous page for base time (d6 weeks or d6 days depending on skills/facility).

Or they can make a single check (*Self-Construction only*):

- ◆ **Task: Cybernetic Self-Construction:** *Life Science (Cybernetics)* or *Trade (Cybernetics Production)*, Education, d6x10 minutes, Average (+0), use DM from Cybernetics Manufacturing Chart.

Cybernetics Manufacturing Chart

Checks for...	DM	Notes
Self-Construction (with their parts)		2.5% reduction
<i>Life Science (Cybernetics)*</i>	+2	
<i>Trade (Cybernetics Production)*</i>	+4	
Self-Construction (buying parts)		10% reduction
<i>Life Science (Cybernetics)*</i>	+0	
<i>Trade (Cybernetics Production)*</i>	+2	
Kit-Building		25% reduction
<i>Life Science (Cybernetics)</i>	+0	Step One
<i>Space Science (Robotics)*</i>	-2	Step Two
<i>Trade (Cybernetics Production)*</i>	+0	Step Two
Fundamental Design		50% reduction
<i>Life Science (Cybernetics)</i>	-2	Step One
<i>Space Science (Robotics)*</i>	-4	Step Two
<i>Trade (Cybernetics Production)*</i>	-2	Step Two

* Either/or, character can choose which skill to roll.

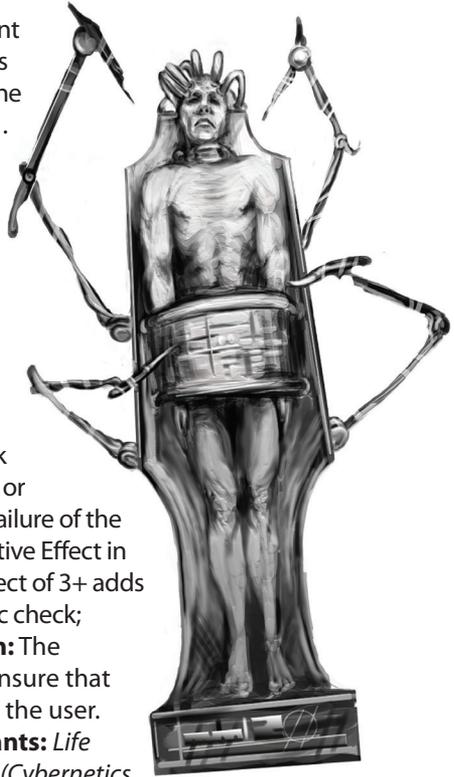
Success indicates the limb works, **failure** indicates that there is some problem in basic functionality. The level of success (**Effect**) determines how “professional” the job looks: an *Effect 1 or more* looks like it is a normal piece of cybernetics, an *Effect 5 or more* makes the cybernetic look unique or particularly impressive.

THE SURGICAL PROCESS

The character will probably not want to install cybernetics on themselves (although a performance artist in the Free People's Republic did try this... once), but a fellow character may elect to perform the surgery. This constitutes two checks and costs 3,000+(d3x1000) Cr in medical supplies:

- ◆ **Surgical Implantation:** the surgery itself is a *Medic* check
Task: perform cybernetic surgery: *Medic*, Education, 1-6 hours, Difficult (-2); the task duration cannot be moved up or down, this is what it takes]. A failure of the check inflicts double the negative Effect in damage on the subject, an Effect of 3+ adds +1 DM to the Cybernetics/Sync check;

- ◆ **Cybernetic Synchronization:** The cybernetic/sync check is to ensure that the system is integrated with the user.
[Task; Sync Patient to Implants: *Life Science (Cybernetics)* or *Trade (Cybernetics Production)*, Intelligence or Education, same time frame as Surgery, Average (+0)].



The second check should be made in secret by the Referee, a *Failure* indicates that the Cybernetic implant will fail sometime after implantation. A *Marginal Success* (Effect 0) indicates that on occasion a “glitch” will develop; a Zoom feature that will not turn off in a cybereye for a few minutes; or an arm that suddenly extends straight out and will not budge for a few seconds. *Success* indicates the sync process worked well, reduce the amount of time rolled to “work in” the cybernetic replacement by the Effect (minimum 2 days).

Surgery Cost Reductions

The cost of some implants combine the hardware and the surgical costs together. If one of the players or their close allies are performing the surgery, there should be a cost reduction of 10,000 Cr for “major” or 5,000 Cr for “minor” surgeries, some accessories involve far more intricate surgeries, some less (Referee's Discretion).

SENSORY REPLACEMENTS

The eyes and ears are the most common form of cybernetic sensory replacement. Early forms of the prosthesis suffered multiple problems from the weight of the sensors themselves, to connections with the proper nerve endings. Well before the 30th century, this was no longer the case, and cybernetic eyes and cybernetic ears have become standard replacements. Note: While there is a slight cost savings when purchasing a single cybernetic sense organ, most chromers replace both since enhancement costs are steady for either single or the pair (i.e. you pay 15,000 Cr for image amplification whether it is in one cybereye or a pair of cybereyes). This is often less problematic in the long run, but many of those who have lost an eye or hearing in an accident are reluctant to voluntarily give up the other. For game mechanic purposes, there is no disadvantage in having one cybereye and one natural eye, or mismatched (one cyber, one not) ears, although in some cases the Referee is free to apply a negative modifier because of the lack of a field of vision.

CYBEREYES

A “basic” cybereye which conveys clear and crisp images to the optic nerve can be installed on most planets for as little as 15-25,000cr. More limited cybernetic eyes can be produced as low as TL 6, but have much reduced quality (very simplistic imaging, the need for bulky external cameras). As the Tech Level increases, the eyes become less obvious (compared to a normal eye).

A TL 8 cybernetic eye is extremely obvious (no *Notice* or *Recon* check required, the eye is readily apparent to observers unless somehow concealed) but still functional. On more advanced worlds, this style of eye still rests at the low-end of the market despite being technically outmoded. They are still desirable because they do not have to be custom fit. Some Spacers use these older technologies because they are far easier to fix and maintain in the field than the more intricate TL 9+ models. Additionally, some of the re-building, maintenance and adjustment of the cybernetic can be done with *Mechanics* or *Engineering (Electronics)* rather than *Life Science (Cybertechnology)* or *Space Science (Robotics)* (the former being more common to the independence-loving Spacers than the later).

On Maintech worlds (TL 9-12), most cybernetic eyes are purchased based on how apparent the chromer wishes them to be. A TL 9



Cybereyes Chart

TL	Functionality	Appearance	Cost, Single	Cost, Pair
6	Basic (-2)	Bulky & Clunky	7,500 Cr*	10,000 Cr*
7	Simple (-1)	Clunky	9,375 Cr*	12,500 Cr*
8	Functional (+0)	Obtrusive	11,000 Cr	15,000 Cr
9	Functional (+0)	Obvious (+2)	18,500 Cr	25,000 Cr
10	Functional (+0)	Unobtrusive (-1)	30,000 Cr	40,000 Cr
11	Functional (+0)	Inconspicuous (-2)	37,500 Cr	50,000 Cr
11	Aesthetic (+1)	Unobtrusive (-1)	48,500 Cr	65,000 Cr
13+	Functional (+0)	Undetectable (-4)	45,000 Cr	60,000 Cr
13+	Aesthetic (+1)	Inconspicuous (-2)	56,000 Cr	75,000 Cr

Cyberears Chart

TL	Functionality	Appearance	Cost, Single	Cost, Pair
6	Simple (-1)	Obtrusive	5,000 Cr*	6,000 Cr*
7	Functional (+0)	Obvious (+2)	5,625 Cr	7,500 Cr
8	Functional (+0)	Unobtrusive (-1)	7,500 Cr	10,000 Cr
9	Functional (+0)	Inconspicuous (-2)	11,250 Cr	15,000 Cr
10	Functional (+0)	Undetectable (-4)	22,500 Cr	30,000 Cr
11	Aesthetic (+1)	Unobtrusive (-1)	34,000 Cr	45,000 Cr
13+	Functional (+0)	Undetectable (-6)	30,000 Cr	40,000 Cr
13+	Aesthetic (+2)	Inconspicuous (-2)	48,500 Cr	65,000 Cr

Functionality: How well the Cyberlimb functions. The number in parenthesis is the DM for appropriate sensory checks made with that cybernetic (visual with eyes et al).

Appearance: How noticeable the cybernetic implant is close up (within 3m). The number in parenthesis after the descriptor is the DM made for a *Notice* or *Recon* Check.

Costs: The costs of the cybernetic eye assumes a well-stocked "Maintech" world in the Twilight Sector Setting (TL 9-12 planets which have access to TL 12 production facilities). In non-Twilight Sector Settings, this is the base cost at TL 12. **Costs with an asterisk:** These outmoded cybernetics are *generally* not found in Maintech markets, even at bargain prices.

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eye for example is obvious if viewed at close range (*Notice* check is made at +2 DM within 3m), but does not protrude outside of the eye socket, and many individuals of lower social status feel it is “good enough”. Beyond TL 9, cybereyes become progressively less obvious to external observers. At TL 11, “aesthetic” functionality can be purchased, which function with a clarity that is consistently better than that of the normal eye.

CYBEREARS

A “basic” cybears is far easier to produce than the cybernetic eye, and provides the individual with excellent hearing even at a lower tech-level. Functional cyberears can be installed for as little as 7,500 Cr on most planets, and only require TL 8+ to be fully effective *and* unobtrusive.

A TL 7 model provides “full” functionality (the ability to hear the sound quality a regular person needs to hear). They are somewhat obvious as implants, but since most people can cover their ears with hair or hats these are quite commonplace. Like TL 8 cybereyes, they are often used by Spacers who want to have cybernetics that can be more easily repaired or those who need something “off the rack” (at higher tech levels they are custom-fitted).

On Maintech worlds (TL 9-12), cyberears are both commonplace and inconspicuous. At TL 11, cyberears have the option of “aesthetic functionality” (the appreciation of a full range of sound slightly beyond that which is capable to the natural ear), for an increase in cost. Beyond a certain tech level (7 or less), increases in technological sophistication determines how obvious these implants may be.

SECONDARY SENSE APPLIANCES

It is possible, but not overly profitable, to graft more than one set of eyes and ears to the body. At higher technology levels, the actual size of the cybernetic device acting as sense organ can be quite small, allowing placement literally anywhere.

One of the biggest problems with secondary senses is that they tend to be confusing or disorienting. Having an eye on the back of your head for example (one of the most common examples) means that *at best* there is a “screen” in the field of vision showing the view from behind that constantly catches the attention (although it could be argued that is precisely what the modification is for, there is a definite fatigue effect that accompanies long-term use). The few attempts to give an individual true 360-degree sight have all

Cybernetic Replacements

led to extreme vertigo and myriad annoyances in daily life. Simple tasks like reaching out for objects become a challenge, just walking through a room often leads to disorientation and motion sickness as the brain cannot handle the inputs which evolution has established for a normal scope of vision. More than one trial effort in providing 360° vision led to disassociation disorder in the subject. These disadvantages are best when roleplayed rather than modeled in the rules, although the Referee should apply negatives of -4 to -6 DMs on occasion. The human mind is still processing this data, and it is only set up for a certain type/amount of information flow.

The best answer to this dilemma is to create secondary cybersenses that become active only when the user desires. An eye in the back of their head that activates on command rather than one providing a constant feed of visual input. Combined with de-activating primary sense organs or simply shunting them to the side, this can be very helpful. If the secondary cybersenses have noise filtering or digital scanning accessories, they might also not be consciously used, but a specific subsystem, such as the IT, can monitor these secondary sense organs constantly and flag the user only when something noteworthy pops up.

CYBERNETIC SENSORY ENHANCEMENTS

The advantage of cybernetic sense organs are the enhancements which can be incorporated into the design. These include:

- ⚡ **Digital Audiolink (cyberears):** This is an implant that is designed to allow the chromer to “hear” digital signals directly. This can be linked to a variety of different inputs, either through a neural plug, internal connection to a cyber implant or to a wireless device.
Cost: Included.
- ⚡ **Digital Scanning (cybereyes):** The eyes (or other remote source) have minute tracking sensors that are able to work with an image co-processor and mathematical co-processor to sort visual input. This is most useful when combined with some other implant (such as an IT or a HUD, where they can help with things like item analysis and facial recognition subroutines). However, when used by themselves they can help to determine ranges or measure objects by sight alone.
Cost: +2,500 Cr.
- ⚡ **HUD Functions (cybereyes):** The cybereye can easily interface with any equipment that is designed for Heads-up-Display output. The graphic overlay is “ghosted” (semi-transparent) over the field of vision. Internal devices that access this hardware include other

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cybernetic implants (most famously the IT, or Integrated Tutelary). The HUD can also be set up to take data from external sources: Once an external device is plugged into the system through a neural plug or is wirelessly set up with the proper codes, the character's own eyes act as a screen for incoming data/images.
Cost Included.

- /// **Image Amplification (cybereyes):** cybernetic vision can be augmented in a wide variety of ways, with both a "zoom" function and an image processing suite in multiple settings. This suite of such modifications allows the chromer to spend a significant action to gain a +1 DM to any vision checks. The chromer also sees up to ten times (10x) further than a normal, or three times (3x) further than normal while retaining heightened clarity (i.e. no pixilation in 21st century terms; beyond 3x, the +1 DM modifier for image clarity cannot be used). Note that "aesthetic" eyes already have a +1 DM for better overall image clarity, and adding this option gives them a *total* of +2 DM (a rare example of synergy, but this still requires a significant action to activate).

Cost: +15,000 Cr

- /// **Noise filtering (cyberears):** Specifically for cybernetic hearing, noise filters can be incorporated into the design with sophisticated algorithms to filter (and thereby cancel out) loud or extraneous noise. This feature can be very handy in loud/confusing areas. By picking up faint sounds and enhancing them, this also extends hearing range in normal (non-noisy/confusing) conditions to three times that of normal hearing (3x, sounds that you would normally hear from only 2m away can now be heard 6m away). The same filtering system can also help to isolate specific voice patterns, although the real payoff for such an application comes with a computer processor that can store and match the data (such as a IT system or sub-processor).

Cost: +17,500 Cr

- /// **Sensory Protection (cyberears/cybereyes):** The use of filters and scattered hardware systems (internal lenses in the eye, baffling sections in the ear) protects the chromer from "sensory overstress" conditions (disorienting flashes of light, extremely loud sounds). Give the user a flat 6+ check (on 2d6) versus flash bang grenades and other "overstress" conditions (i.e. a straight 6+ on 2d6 to **avoid** complications), and even if the check fails *halve* (½) the effects in any case

Cost: +7,500 Cr.

“If you could only see what I have seen with your eyes”

Broad Frequency: The ability to hear into the sub-, super- and Ultrasonic range.

Broad Spectrum: The ability to either in the near-infrared and the ultraviolet range, allowing user to pick up on certain light sources most people cannot or also detect some substances which absorb these wavelengths differently.

EM Band: The ability to detect electromagnetic signals within 30-60m. Must be “tuned” to specific bands (minor action to initiate, free action to scan through bands).

Thermographic: The ability to see heat, determining if something is hot/warm/cold at close range. Hotter objects can be seen further away.

Tetrachromate: Provides a more discriminate color palette (sees more shades/hues of color).

Ultrasonic Vision: Used to generate 3D outlines of physical objects within a given range (depending on the strength of the source). A standard ultrasonic handheld can provide clear images to 60m, military units to 120m, loud noises “illuminate” about 5m.

Wavelength Settings Chart

Eye	Ear	Type:	Cost
x		Tetrachromate	200 Cr
x		Thermographic	2,500 Cr
x		Broad Spectrum	3,000 Cr
x		Ultrasonic Vision	10,000 Cr
x	x	EM Band (low)	3,000 Cr
x	x	EM Band (High)	5,000 Cr
	x	Broad Frequency	5,000 Cr

- /// **Recording function (cybereyes/cyberears):** Data from a cybereye or cybears is inherently in “digital” format and may be easily shunted onto a memory encoding device. The encoding device does not even have to be installed inside the body of the user, but might be a computer or commlink attached to the belt or concealed in a pocket that is wirelessly connected (2m range). *Note: shunting recorded data to a computer worn/installed in or on the character’s body is an included feature, no extra costs involved.*

Cost: Basic recording functions are included. Add +500 Cr for a shortrange transmitter (100m), +1,500 Cr for a medium-range transmitting unit (range ~1 Km).

- /// **Wavelength Settings (cybereyes/cyberears):** The eye can be set to produce sensory data from any one of several wavelengths (see chart above). Special illuminators (torch/flashlight and chemical wand styles) can utilize these wavelengths for eyes. While many such wavelengths are merely annoying static, there are a wide range of applications that can bring a +2 DM to specific tasks with Referee discretion (for example: hearing sub/supersonics might help diagnose a faulty engine). In some cases, this enhancement simply broadens the available palette of sense information (for example, seeing into the UV spectrum can pick up some bodily fluids which absorb UV differently).

Cost: Depending on wavelength(s) to be added (see chart)



CYBERLIMB REPLACEMENT

Cybernetic limbs have been around since midway through the Long Pause, and became a largely refined technology in the 22nd century (TL8-9) in terms of their functionality. Cyberlimbs are the most common form of limb replacement due both to their lower cost and more simple implantation/grafting process (as opposed to bio-replacements/bionics). They do have some serious detractors however.

Many who have cybernetic replacement limbs complain that the tactile sensors are “distant” and only have “vague” approximations of real touch sensitivity. For some users (the perpetually clumsy), this is not problematic because they also feel less pain, for others this lack can range from annoying to tortuous (for artists or some athletes for example who rely on such feedback). Cyberlimb manufacturers have made great strides in this field over the last five to six centuries, particularly with organic components. The advent of biological/bionic technology however has sent those who desire “genuine feeling” limbs seeking those products instead.

Cyberlimbs come in several popular models (all costs below are for those in a “Maintech” market and represent a TL 9-12 product).

Baseline Cyberlimbs

These are very obvious but fully functional cybernetic replacements. They have few aesthetic graces (although some artists have used them as a canvass to great effect), and are designed primarily for functionality. These have a great deal in common with robotic limbs.

Because of the differences between natural and artificial materials, these limbs can be made quite small/thin or “skeletonized” (such that they have the appearance of a — rather thick — skeleton or framework) which makes the limb handy for fitting into tight spaces. These skeletonized limbs can only be enhanced by +2 Strength (to Str 10) and the style precludes more than 2 or 3 additional accessories added (except gearmounts).

Non-skeletonized limbs take up more-or-less the same amount of space as a normal limb, and are generally seen as less threatening by society. Baseline cyberlimbs of either type can attach gear relatively simply to the exterior. Many pirates (for example) attach weapons to the outside of their cyberlimbs, which has come to be known as a “Pirate Holster” thanks to action viddies.

Stats for Baseline Limbs (even skeletonized) begin at Str 8, Dex 7

Access: Standard time for construction. In fact, some of the lower-end cyberlimbs can be constructed “off-the-rack” mere hours before surgery by using modularized components.

Cost: 25,000 Cr (Skeletonized), 30,000 Cr (“Standard” version)

Faux Cyberlimbs

These cyberlimbs are able to mimic natural arms and legs in form as well as function, as their general construction matches that of existing limbs (or designed using aesthetic anatomy programs). The outer covering of the faux limb consists of organic skin, synthetically grown and matched in DNA to the chromer so that it can be seamlessly grafted to the rest of the body. Inside, a variety of subcomponents heat the skin, provide it with a pulse and other “lifelike” elements. Together, these make the limb reasonably undetectable by a simple visual check:

- ◆ **Task; To detect a faux limb made to look like a natural limb:** *Life Science (Cybernetics)* or *Trade (Cybernetics Production)*, Intelligence or Education, 10-60 seconds, Average (+0); or *Notice*, Intelligence or Education, 1-6 minutes, Very Difficult (-4).
DMs: +2 (minimal sensors), +4 (good sensors), +6 (medical sensors)

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Faux Cyberlimbs *may* also be made obviously “cybernetic” in some way. While the concealment factor normally associated with faux limbs makes this design choice apparently self-defeating, it can be an obvious (and powerful) “fashion statement” (also known as a ‘Sorayama’ in 30th century parlance). A popular fad in the 28th century, seen once or twice since, was to create limbs that looked perfectly natural in size, shape and positioning except for the transparent casing, allowing onlookers to see the inner workings of the exposed limb. These cost roughly the same as a reasonably undetectable faux cyberlimb, but were also artistic “conversation pieces”.

Faux cyberlimbs often have concealed spaces where the housing to mimic natural limbs leaves hollow areas. The sheer variety of design and body-types makes this a random process. Assume that a faux cyberlimb will have d3 open full spaces which could house something the size of a 21st century cigarette pack **or** d3+2 half spaces which are smaller than this (lighter-sized). This number should be rolled once the limb is installed and stays constant for that limb.

Stats for Faux limbs begin at Str 8, Dex 7

Access: It takes 2d6+3 days to grow the skin that is fitted over top of the faux cyberlimb. This provides synthetically-grown (but otherwise natural) skin and a thin layer of fat to help provide the limb with a natural feel. For an additional 2 days of growth (making the total 2d6+5 days), nerves can be integrated, providing “real” feeling on the limb as well (many chromers do not incorporate this, as many see the ability to ignore sharp/hot/otherwise dangerous things a bonus of the cyberlimb).

Cost: 75,000 Cr

Oversized Cyberlimbs

These cyberlimbs are usually reserved for the less recherché performance crowd and fighting athletes, and are quite unusual. Oversized limbs are larger than normal frames. The smaller end of the oversized limb models might even be appropriate-size (sort of) for characters with 10+ Str and End (indicating a mesomorphic body frame). Reinforcement (see page 30) comes standard with this implantation and is incorporated into the costs of the limb.

The larger size of the frame can cause some balance issues unless they are paired (i.e. two legs, two arms). Chromers also rarely fit well in tight spaces (most ‘econo’ vehicles, some styles of escape pod, etc). The effect of these inconveniences are best handled by the Referee’s

Cybernetic Replacements

discretion, causing the occasional negative DM as appropriate. More powerful actuators and longer strides for oversized legs will add +1.5m to the combat speed of the chromer (but their height/bulk also limits *where* they can go).

Stats for oversized cyberlimbs begin at Str 12 (+2), Dex 6.

Access: Custom-assembled from pre-built parts or specialty shops. The additional reinforcement surgery usually heals at the same time as the cyberlimb (the 4+d3 days as noted in *Reinforcement*)

Cost: 125,000 Cr (includes reinforcement up to Str +4, +1,000 Cr for additional points to reinforcement)

Finelimbs

These uncommonly-found cyberlimbs are generally designed for greater length and/or fine manipulation. Finelimbs are almost always found for arm-replacements rather than legs as they make poor walking limbs. Finelimbs are somewhat derisively referred to as “twiggy” and they look like skeletonized limbs, only moreso. They incorporate multiple joints (not just elbow) telescoping features and can extend at various points (upper arm, lower arm, finger) all individually. To create a full extension reach of twice the normal arm or (far less commonly) leg length Finelimbs often incorporate more than five digits on the manipulating end of the limb, sometimes as much as twelve (which strains the natural control potential of the brain, part of the cost is co-processors that help ease this).

Stats for finelimbs are Str 2 (-2), Dex 12 (+2). They can have at most +4 Str added to them (Str 6) before they become too-bulky for the fine work which they were intended.

Access: Found in those places specializing in precision robots. (Design time, +20%).

Cost: 100,000 Cr

Tentacles

While this form of cyberlimb is occasionally seen for primary limbs, usually among the more outré Spacers who find them useful in microgravity, they are unusual. Tentacles have excellent flexibility and a better “grip” (if they can wrap themselves around something, if not they have no grip), but far less efficient in other ways to standard manipulators. Thumbs are mighty handy, and some tentacles use thumb-like ancillary tentacles (aka “fine manipulators”). Tentacles tend to be more common as secondary limbs, and many feel that they are frankly more useful as such (also see the sidebar on Tails, page 30).

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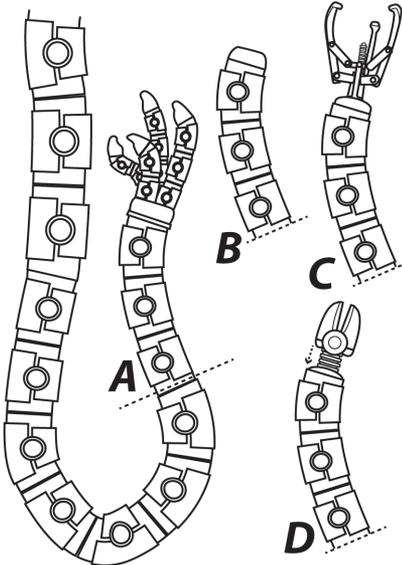
Tentacles are found in various types, and are rated in terms of Str/Dex by their thickness:

- ⚡ Thick (2.5 inches/6.3 cm in diameter) are base Str 10 (+1), Dex 2 (-2)
- ⚡ Average (1.5 inches /3.8 cm in diameter) are base Str 7, Dex 5 (-1)
- ⚡ Fine (0.75 inches/1.6 cm in diameter or less) are base Str 3 (-1), Dex 9 (+1)

Note that for +10% cost, tentacles can be outfitted with “fine manipulators” (see below) which add +1 to Dexterity; Clamp-type and Claw-type tips are counted in the normal cost of the tentacle. The characteristics of tentacles of all types can be modified as with any cyberlimb (see Page 29).

Time: Found more often in orbit than on the ground, but they are still available in a wide range of clinics on or off-world.

Cost: See chart below.



Tentacle Cost/Diameter Chart

Length	Diameter	Cost
>50cm	Thick	25,000 Cr
	Average	45,000 Cr
	Fine	65,000 Cr
51cm-1.0m	Thick	40,000 Cr
	Average	60,000 Cr
	Fine	80,000 Cr
1.1m-2.0m	Thick*	70,000 Cr
	Average	100,000 Cr
	Fine	130,000 Cr
2.1m-3.0m	Thick*	170,000 Cr
	Average*	150,000 Cr
	Fine	180,000 Cr
3.1m-4.0m	Average*	200,000 Cr
	Fine	175,000 Cr

* requires Reinforcement to handle excess weight.

Tips for Tentacles

The letter references are for the graphic above. All can be used for any length/width.

- ⚡ **A:** *Fine Manipulators* are sub-tentacles, usually three or four in number, which sprout out at the end of the tentacle. These act as (extremely flexible) fingers and provide the limb with a +1 Dexterity. (Cost Modification: +10%)
- ⚡ **B:** *Blunt-heads* are the simplest way to top tentacles. Allows no fine manipulation. The end is usually made from a stiff rubber-like material. (Cost Modification: -5%)
- ⚡ **C:** *Claws* use 3-to-6 pronged “arms” designed for maximum gripping strength. These are good at maintaining a hold on their subject (+1DM holding/grappling)
- ⚡ **D:** *Clamps* a pair of scissoring levers mounted on a retractable stalk to grasp. When closed, they are both blunt and solid, good for “punches” (+1 Damage)

Hand-to-Hand Combat and Cyberlimbs

The base damage done by an unmodified human when striking unarmed is d6. When grappling, unmodified humans can choose (among several options) to do 2+Effect in damage.

Being made of hard, artificial materials, certain types of cyberlimb will do more damage than others in "unarmed" combat.

Note that characters with some types of limb have a (slightly) extended range to grapple or strike. When grappling, those with tentacles who win

the contested grapple test may elect to "wrap" their opponents as one of the listed options, adding a +2DM to their next grappling maneuver against the same (losing) opponent. Tentacle limbs can also strike (full tentacle length) or grapple (up to 75% overall tentacle length) at longer range than most normal unarmed combats.

HTH Damage Chart

Cyberlimb Type:	Damage Adjustment	
	Strike:	Grapple:
Baseline limb	2d6 or d3+3	4+Effect
Faux & Partial limbs	d6+3	3+ Effect
Oversized limb	2d6+4	6+Effect
Finelimbs	d3	0+Effect
Tentacles, Thick	2d6+2	5+Effect
Tentacles, Average	d6+3	3+Effect
Tentacles, Fine	d3+1	1+Effect

Additional STRENGTH/DEX for Cyberlimbs

Stronger servos and extra myomer, or more delicately balanced and better calibrated actuators etc. can substantially affect the statistics associated with cyberlimbs. All modifications should be made from

the "base" models. The "Bulk" is a Dex Penalty associated with higher levels of strength, so that a faux cyberlimb, Str 14 (+7 Str) has a base Dex of 5 rather than 7 (Bulk -2). To bring this limb up to a Dex 12 would then require +7 Dex.

Added Cyberlimb Strength/Dexterity Chart

Adjust	Strength Enhance		Dex Enhance
	STR Cost	Bulk	DEX Cost
+1	2,500 Cr	"SK"	5,000 Cr
+2	5,000 Cr	"SK"	8,000 Cr
+3	7,500 Cr		12,000 Cr
+4	10,000 Cr		16,000 Cr
+5	15,000 Cr	-1 Dex	21,000 Cr
+6	20,000 Cr	-1 Dex	35,000 Cr
+7	30,000 Cr	-2 Dex	50,000 Cr
+8	40,000 Cr	-2 Dex	75,000 Cr

See the Overstress task (Page 11) for rules

on what to do with limbs that have greater than the normal amount of strength. There is no real benefit for limbs with higher Dexterity, this is often purchased simply up to the users characteristic level.

Note that "SK" indicates those enhancements which can still be used for a skeletonized limb (i.e. past +2 Strength, a baseline cyberlimb cannot be skeletonized).

Reinforcement: Handling Higher Strength Limbs

Over-strength limbs can be paired with augmented muscles in these key locations so as to allow the chromer to use their full strength better (see **Overstress, page 11**). This is known as *reinforcement* (although when done across the entire body, it amounts to the same as Artificial Muscle Bonding, see page 62). With cyberarms for example, shoulder and back muscles might be supplemented by additional artificial muscles, or *myomers*, in order to prevent strain and injury. This way the greater strength of the limb can be used for full advantage without as much threat of overstress.

Reinforcement is costly, as it involves integrating tailored synthetic tissue to the body, implantation, nerve cluster work and the like. Unlike Artificial Muscle Bonding, reinforcement is targeted at specific areas of the body. The cost of this treatment runs several thousand credits (depending on Strength). Each reinforcement is unique, based on the design of the bionic and the body of the user. The game effect of Reinforcement is to provide a +4 DM to the **Resist Overstress Injury** task (see **Overstress, page 11**).

Time: Standard. Artificial myomers are found in great abundance in medical facilities. Healing time is 4+d3 days, often done at the same time as the cyberlimb healing (so roll twice, use the higher number for full recovery).

Cost: Roll (d6+4)x1,000cr plus 1,000 Cr for each point of strength over the character's base Strength

Special Application: Tails

Tails are simply tentacles mounted at the coccyx. While they can be very useful, they are also of relatively limited range because of their placement (unless using them to the rear of the chromer). An "Average" (in terms of thickness) tail can be used to try to help maintain balance (+2 DM to any task involving balance). Fine tails tend to be too small, thick tails tend to be too large if made too long (thus actually making balance tests slightly harder), although a short (under approximately 50cm) thick tail *can* be used for a balance bonus.

Many Spacers splice in tails in order to help them maneuver in microgravity (having a tail adds +1 DM to most *Zero-G* skill checks). The tail also grants the Spacer an additional limb to 'reach' for or latch onto a solid handhold, always handy for those in microgravity. Spacer tails tend to be either "average" or "fine" in thickness since there is little use for a thick tail in microgravity (the higher strength *isn't* needed, the higher dexterity *is*).

Special Application: Secondary Limbs

Cybernetic limbs can also be made into secondary limbs, extra arms or tentacles for example. The practice is common on some colonies, but not generally. Secondary limbs encounter the same kinds of problems that secondary sensory organs do, plus they are difficult to use with any fine manual dexterity. While some human brains can master the use of both hands equally well, aka “ambidexterity”, there is only so much data that the brain can handle in using multiple limbs at once. Additionally there is an attention issue. An individual with an extra set of arms could *physically* play two different pianos, but how *well*? Which would their attention be focused on? And while one might train rigorously (and yes, many performance artists have in the past) to accomplish a single task, how many different things could they spontaneously do with a totally different kind of activity? Some viddies portray multi-armed soldiers firing at multiple targets with each of their four (and in one popular viddie making the rounds on Dorlass, six) arms at one time. This however is entertaining hype. Spray and pray? Maybe. Accurate fire? No.

A more useful exercise might be (in a non-combat way) to use the secondary hands to brace an object, then holding them steady in place use the primary hands/arms to perform delicate manipulations. Thus the multiple limbs can be useful, but not for all tasks given the limitations of the human brain and requirements of our attention. While admittedly there are some cybernetic and bionic augmentations that can help with this, Referees should be free to hand out negative DMs for efforts to use the limbs independently without rigorous training. Several martial arts *katas* do incorporate multiple limb techniques, which only demonstrates that these tasks are very difficult to master.

Many Hands Make Light Work... Sort of.

Like the tentacle (which is often a secondary limb), having a tail or more than two arms might apply a +1 or +2 DM to specific circumstances, especially to offset a penalty. This is subject to the DM's discretion, and should only be employed for combat if the character is doing something unique or interesting with their additional limb (i.e. don't just give them a cheap bonus because they have one, make them work for it).

The primary advantage to having multiple limbs is that this allows the character greater flexibility with the kinds of actions they *can* undertake. For example, having extra limbs allows them to hold more gear; or do more things at once (lift or carry someone *and* press a button at the same time). A better way to reward a multilimbed character is to find one of these “non-DM” benefits.

Custom Job: the Duo-Hand

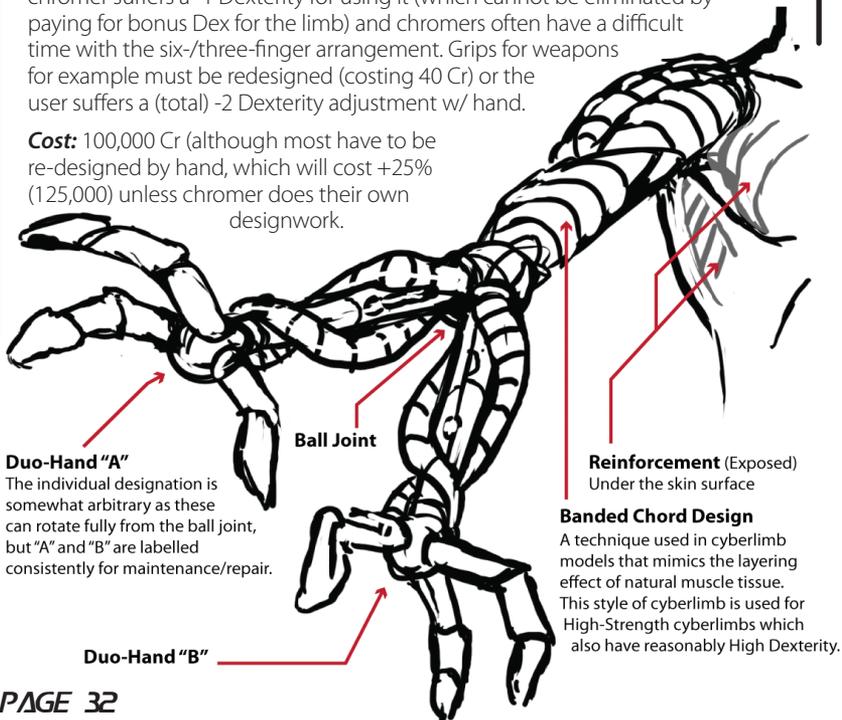
One of the stranger custom cyberlimbs is the *Simpson-Colmbs Duo-Hand*, which was built in very small production runs from 2925 to 2937 by the Simpson Cybernetics Corporation of Hephaestus (Crescent Sector, one sector to the "left" of the Twilight Sector). The first Duo-Hand was designed for a member of the Hephaestian Hellfires, a fashionable fighting-club, but quickly became very popular with the faddish members of that group and their hangers-on (the Hellfires were social trend-setters at the time).

The cyberlimb uses a "banded cord" overall design (popular at the beginning of the 30th century) which has what appears to be a thickened forearm and six-fingered hand (or more properly, four fingers and two opposing thumbs). In actuality, the forearm splits into two separate (skeletonized) forearms, joined at the elbow to the main limb, each of which possessing a three-fingered hand (two finger-digits, one thumb). The hands are each capable of independent movement and prestidigitation (subject to the ability of the chromer, per normal). Due to the extra weight of the duo-hand however, the surgery has to include reinforcement (page 30, note: this is a separate purchase).

In hand-to-hand combat, the Duo-hand proves very useful. Strikes do significant damage (3d6) with a "double punch", and make grappling a horror for an opponent (+2 DM to grappling attacks against an unknowing victim, a +1 DM even if the other opponent knows of the duo-hand and it's capabilities).

Unfortunately, the six-fingered hand makes some normal tasks very difficult. The chromer suffers a -1 Dexterity for using it (which cannot be eliminated by paying for bonus Dex for the limb) and chromers often have a difficult time with the six-/three-finger arrangement. Grips for weapons for example must be redesigned (costing 40 Cr) or the user suffers a (total) -2 Dexterity adjustment w/ hand.

Cost: 100,000 Cr (although most have to be re-designed by hand, which will cost +25% (125,000) unless chromer does their own designwork.



CYBERNETIC LIMB ENHANCEMENTS

The advantage of cybernetic limbs is that they can incorporate a wide range of technological enhancements:

- /// **Detachable Hand/Foot:** The hand (or more rarely, foot) of the cyberlimb is able to be detached, often with some degree of control retained by the chromer. Usually this amounts to grasping and moving fingers, although a crawl is possible (about 0.5m/minor action). Three basic types of this enhancement are commonly found:
 - /// *Non-controlled*, which the user can disconnect but has no control over once removed.
 - /// *Wireless systems*, which allow control up to 10m away.
 - /// *Lanyard systems*, which have a tether that allows control but limits range to the length of the tether (a spool of cable 3m is rolled inside of the arm standard, although some users splice these to make them considerably longer). Spacers sometimes literally throw their hands out across an open space in microgravity and then use the lanyards to drag them back.

Cost: 7,500 Cr. (Wireless) or 5,000 Cr (lanyard). If no controls, a detachable hand costs only 500 Cr. Replacement hands cost 15,000 Cr (Wireless), 12,000 Cr (Lanyard) or 5,000 Cr (Non-controlled). All prices for a baseline cyberlimb.
- /// **Extension Blade/Claws:** A blade can be extended from the long bone of the forearm made from high-density alloy and honed razor sharp. The blade extends out approximately the same distance as a combat knife. Alternatively, a set of claws from the fingertips instead. Combat rolls made with the blade use *Melee (Blades)* while the claw uses *Melee (Natural Weapon)* skill. The blade does strike+d6 damage while the claws do strike+3 damage.

Cost: 17,500 Cr (Blade), 10,000 Cr (claw), 15,000 Cr (retractable claw)
- /// **Gear Mount:** Limbs can be used as a mount for various type of gear. Precisely how much gear is determined by the Referee, keeping in mind that it is a limb when deciding how much gear can be attached – “skeletonized” standard cyberlimbs can add more gear before they become encumbered, finelimb can add the least before their normal functions become inhibited. Most handheld devices can be mounted to a limb, and some can be modified to function by way of cybernetic command the same as a cyberhand might. The most obvious example of this is the weapon mount. A handweapon, pistol or machine pistol can be bolted onto the limb and fired (in the case of a firearm or launchable hand-weapon) through mental command. While “handy”, this mounting can lead to problems when going into situations

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where guns may be problematic (police stations, high-class meetings, transportation hubs). A stationary mount must be aimed before each firing or incur a -2DM penalty (and the first round of aiming gains no aim benefit). Note that this is not the same as a Weapons Suite or Smartgun modification, it just mounts the gear/weapon on the outside and connects to any control cables (if present).

Cost: 150 Cr to have the gear for both the mount and the control interface just to hold/release the gear. 250 Cr to provide full control over the item (more than just holding/releasing it from the limb). Note this can often be done with scraps (especially simple mounts with no cybernetic control) with *Mechanics* skill. 1,250 Cr for an articulating mount.

/// **Holographic Imager:** A Holographic imager can be built into the limb, allowing for the display of images (everything from flat data screens to display text to moving 3D images). See Page 76 for more details.

Cost: 2,500 Cr for single projector.

/// **Improved Simulation:** By adding components designed to further mimic living tissue, and using more high-grade synthetic biological tissue on the outer covering, a faux limb can be made to look even more like the natural limb on casual inspection.

Cost: 2,500 Cr/ -1 DM to the Spot Faux Limb check (up to -4)

/// **Injection Port:** Cyberlimbs easily offer a means of carrying, storing and injecting medicinal (or other types of) drugs into the system (see Injection Ports, page 67). Each 3-dose reservoir takes up a half-space in a faux limb, while this is less of a consideration for other cyberlimbs. Cyberlimb injection ports can accept most standard medical dose ampules.

Cost: 5,000 Cr plus 150 Cr per dose.

/// **Subsystem: Injection Spike:** This sub-system uses a retractable needle placed in one of the fingers of the hand, to inject the medicinal (or poison) stored in one (or more) of the Injection Ports. Some, a few, or even all of the Injection Port drugs can be connected to the Spike (determined when purchased). In combat, the Spike must penetrate the armor/akin of the target to deliver the dose(s): it does $\frac{1}{2}$ (Limb) Str DM + d6 and penetrates 5 points of armor. If the Spike penetrates, it does one-half the damage indicated (minimum 1) and injects the drugs into the 'victim'. If the Spike cannot penetrate the armor of the target, there is a good chance that it snaps off and must be replaced (rolling under 8+ on 2d6, Referee's may modify for materials involved at their discretion). Note: the Spike is painful as a delivery system, the character can install a standard needle which has minimal penetration value instead (no damage).

Cost: +2,000 Cr plus 250 Cr per replacement Spike (1 Cr/needle).

Cybernetic Replacements

/// **Mag-Grapplers:** The chromer can activate magnets on their limb to keep them connected to a solid ferrous surface. Their utility is a measure of their surface area. Foot-mounted and forearm mounted Mag-Grapplers are capable of holding onto up to 75 kg/foot (at 1G), hand-mounted grapplers are capable of holding onto 35 kg/hand (at 1G). These are more common on Spacer cyberlimbs, where the magnets can be used at much lower strength in microgravity to navigate/attach better to ferrous strips in floors and ceilings (which are common features due to the widespread use of magnetics in Z-G environments).

Cost: Adds 12,500 Cr to the price of each limb so modified.

/// **Pop-Out Holster:** A cavity inside of the cyberlimb allows a weapon to be stored inside (it doesn't have to be a weapon strictly speaking, although most non-weapons are stored as gear mounts on the outside of the limb, still some chromers do use holsters for non-weapon purposes). Faux cyberlegs can only hold small "hold-out" type pistols, baseline limbs can hold medium-sized hardware (a standard automatic easily, a machinepistol with more problems unless the limb could otherwise be skeletonized and has only minimal other enhancements), while an oversized limb can easily hold big revolvers and pistol-type SMGs and even some (cut down) shotguns. Arm pop-out holsters have less capacity than legs. Releasing the weapon in the pop-out holster is about as fast as a normal holster draw (as much of the action is happening simultaneously), some claim faster, others slower. As usual, it is more the actor than the hardware that decides.

Cost: 5,000 Cr (small), 10,000 Cr (medium) 12,500 Cr (large).

/// **Skids:** A cyberfoot can be provided with enough gravplate technology to significantly lighten the tread of the user (the term 'skids' are also used for vehicles that employ gravplates similarly, see *Setting Book Beta*). This allows the user to step with feather-softness over 'troublesome' flooring. With special rollers or skid-pads on the feet, they can also 'skid' or slide along pavement (as a skater) or other hard and slightly slick surfaces (rock, ice, tarmac, cement, some types of flooring) at +3m of combat movement (+6m if they have spent three turns "getting up to speed"). They also need to make an *Athletics* check at intervals deemed by the Referee to avoid falling/losing balance. Skids may be used for up to 15 minutes at a time on average (less for larger and more for smaller users) before they run out of charge (recharging takes 10 minutes from a high-output source like those used for weapons or 20 minutes from a consumer-rated source).

Cost: +15,000 Cr. The 'skid pads' cost a negligible amount if home made, or 50-250 Cr if commercially produced, although the former often give a +1 DM to the *Athletics* tests at the higher end of the cost scale due to their special engineering.

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- /// **Slappers:** Essentially a kinetic explosive device fitted onto the palm or foot of the limb. The range is contact to 2-3 cm away. The explosion does 4d6 damage and ignores up to 4 points of armor. After firing, the hand or foot is impaired until it can be repaired (-2 DM for fine work, -1 DM for most other activities with the hand/foot).

Cost: 20,000 Cr, repairs to the limb require 1,000-6,000 Cr and a minimum of 15 minutes with the proper tools and supplies.

- /// **Swiftshod:** This double-leg (in the case of humans, some uplifts require more) modification uses telescoping sections, along with balance technologies and dynamic re-positioning, to allow the user to increase their ground speed significantly. The legs will change position as well to allow for the fastest possible action (it is common for the user to become digitigrade and drop slightly due to position changes in the leg, but this depends on several factors including the speed desired, the environmental factors involved, the user's stance etc.). This translates into a +6 DM on sprinting checks (see TMB pg. 52).

Cost: Adds 20,000 Cr to each leg (this *must* be bought for both legs, since both must be so-altered to function properly)

- /// **Telescope function:** The arm or leg has a telescoping shaft built in that gives the chromer a longer reach/greater height. Most designs can incorporate an extra 40+d6 centimeters (approximately 1.5 feet) without compromising structural integrity. It generally takes a 6-second combat round to extend/retract the limb, although a "snap actuator" can be installed for 500 Cr extra to make extension very fast (it also adds 2 points to unarmed damage by "springing" a punch).

Cost: 12,500 Cr

- /// **Weapon Suite:** This combination of hardware (or Suite) incorporates the various advantages of gyroscopic balances in the arms/wrists or hands, a direct HUD connection with the laser targeting system on the weapon and any Image Amplification the mods user possesses (to adjust target points for distance for example) to grant 2 points worth of DM reductions (cancelling out up to -2 DM from aiming or range or some other extraneous factor) or a +1 DM to hit. The Recoil modifier for one-handed weapon-use is lowered by 2 (i.e. it allows two extra points of recoil to be negated over and above their Strength DM).

Cost: 20,000 Cr. Any weapon used with the suite must be specially adapted for the technology, adding 1000 Cr to the price of a handweapon or +20% to the cost of more expensive weapons.

OTHER CYBERNETIC REPLACEMENT OPTIONS

In addition to the grafting/implanting of sensory organs and cyberlimbs as whole units, there are a variety of other possibilities for cybernetic replacements. These include the following:

- /// **Cyber Reconstruction:** This is a non-limb, non-organ form of 'spot' replacement, often for damage sustained to the body that is capable of being repaired *without* completely replacing a limb or organ. This is commonly done during character creation to restore lost characteristic points in situations where limb, organ or sensory replacements are not specifically noted.
- /// **Partial Limbs:** Rather than replacing entire arms and legs, only a portion of the limb is replaced.
- /// **Sub-Torso Replacement:** Sometimes wounds or accidents make the long-term viability of retaining bodyparts beneath the ribcage counterproductive. This is a major modification.
- /// **Vital Organ Replacement:** In addition to sense organs, there are other vital organs that can be replaced cybernetically.

CYBER-RECONSTRUCTION

Replacement of limbs and organs is not the only kind of repair that can be accomplished using cybernetics. Indeed, *most* cybernetic repair from Injury Tables rolls during character creation fall under the category known as "Cyber-Reconstruction". This process will sometimes require only a small part of the body be replaced with a cybernetic equivalent, like a portion of the face or a particular part of the body (a finger, or a knee or elbow joint for instance). Sometimes these parts are found underneath the skin (and effectively invisible), while at other times they are quite prominent. For purposes of their game effects, this point is entirely left to the Referee and the player.

Likewise, there is no game-effect for cyber-reconstruction (other than the points regained in the process), but it can be a useful way to 'personalize' a PC or NPC: The man with a chrome-covering over the left side of his face; the woman with the silver fingertip to replace a childhood injury that has left deeper emotional scars; the Mutant War Veteran who reveals the metal beneath their skin only when they are wounded, or pass through a metal-detector. These details make for great visuals and even better backstories.



Cyber-Reconstruction

Cost: 25,000 Cr/point during the game (i.e. post-charge) to repair long term injuries. This pays for both the parts and the surgery. If the character can design/build cybernetics subtract 10,000 Cr/point from this cost (if they do it themselves), and subtract a 5,000 Cr/point if they can arrange surgery. So if they do all that work themselves it is still 10,000 Cr/point (for raw supplies and parts).

PARTIAL LIMBS

The limb replacement rules assume that the replacement starts at the shoulder (for a cyberarm) or the hip (for a cyberleg) where the muscles of that region are redesigned to better carry the weight of the cyberlimb and offer good attachment. But what if the character only needs to replace *part* of their arm or leg? A hand only? Or from the knee down?

In this case determine how much of the limb is to be replaced (see chart below) and use a percentage of the limb's base cost as well as the cost of any additional Str/Dex purchased for the (partial) limb.

For Example: A character with Str 12, Dex 8 gets a Forearm to Hand Partial Limb (50% cost). If they install a baseline cyberlimb (base cost: 30,000 Cr) and want to match the character's own characteristics (which begin as all baseline limbs at Str 8, Dex 7, so adding +4 Str, base cost 10,000 Cr and +1 Dex, Base cost 5,000 Cr) they will pay a total of 22,500 Cr (15,000 Cr for the arm, 5,000 Cr for the +4 Str and 2,500 Cr for the +1 Dex).

Partial Limb Chart

Partial Limb:	% of Cost
Hand only	25%
Elbow to hand	50%
Foot only	20%
Knee to foot	50%

Enhancements

These cost as normal. The smaller space available in the limb will also reduce the amount of space available for enhancements. This is a matter left to the Referee's discretion, but common sense should prevail.

High Strength and Damage for Partial Limbs

While the squeezing strength of a cyberarm is based on the strength of the partial limb, there are *no* bonuses to overall strength when the partial limb has a High Str (see “High Strength Limbs”, page 11). The unarmed Damage Adjustment for partial arms is d6+3 (strike) and 3+Effect (optional, as usual) when successfully grappling.

SUB-TORSO REPLACEMENT

As noted above, sometimes wounds can be so terrible that they cause the subject to lose function in all of the organs beneath the torso (ribcage and below). Sometimes, bio-replacement technology or cyber-reconstruction can restore partial use of this portion of the body, but in all too many cases of massive trauma, even this is impossible.

Many of those who have taken this kind of massive trauma have died and have been brought back to life afterwards through resuscitation techniques. As discussed in ***Tinker, Spacer, Psion, Spy*** (see “Medical Tables” page 174-175), 30th Century medical technology is very advanced, and even those who have died can often be brought “back to life” by medtechs. In other cases, some fast-acting diseases, or worse yet, a cyberswarm attack (See ***Beyond the Open Door***, pg. 68, or ***Setting Update #1***, pg 32-33 for even more detail), can literally eat away the body, requiring this kind of radical cyber-replacement.

Technically, those with Sub-Torso Replacements no longer have fully functional gastrointestinal tracts, and many of their blood filtering organs will have to be replaced or augmented, and of course their legs are long gone for locomotion (as are the genitalia for procreation). Often, even if the lungs can be partially saved, they will require strengthening and quite probably full replacement. Luckily, all of these bodily systems can be replaced with relative (technical) ease (and yes, staggering cost) in maintech (TL 9-12) medical facilities. While some of those who have taken such massive damage will consider cyborging very strongly, there is a large body of literature that suggests this is not an entirely optimal choice. Cyborging is an irreversible step.

By default, the chromer with Sub-Torso Replacement uses a hyper-efficient nutrient system that employs a mineral-smelling white slurry for all of their nutritional requirements. Yum. The chromer still requires air and water/hydration as normal (although lung options are available).

This modification automatically provides the benefits of a Three-Plug Neural-Input, required for the lower body systems (this can be upgraded to a five-plug system for the relative low cost of +35,000 Cr).

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Additionally, there are some Accessories — such as implanted comm-links, injection ports, integrated squawk box, integrated tutelaries, and holographic imagers — that can be added to the mechanized portion of the chromer's body for a fraction of their normal costs (especially if it is done during the replacement process). In some cases, these can be added on in the same fashion as gear mounts (see Page 33). Cyberlimbs, such as tentacles can be added to the mechanical portions (or Frame) for ½ base cost (any enhanced strength or dexterity costs are also halved, although all other enhancements cost their normal value).

Cost: 1.25 Mcr (750,000 Cr for hardware/500,000 cr for the surgeries)

Sub-Torso Replacement Enhancements

⚡ **Bipedal Frame:** This is the base “frame” for sub-torso replacements which can mount two cyberlegs and has the capacity to hold a small number of other options. “Cargo capacity” is limited, depending on what other options are selected (the basic frame can hold Independent lungs, a Genital Sweet, and a Replacement GI tract easily with a *small* amount of extra space leftover for a piece of tech or two). *Note:* Like “rides” the frame can be changed into and out of as a TL11 Cyborg LSU (page 120).

Cost: Included (the framework alone, chromers purchase the cyberlegs as noted above and other enhancements separately)

⚡ **Independent Lung:** An independent lung replaces the old lungs with a semi-pressurized air intake system that cleans and filters air while it replenishes air stores. This enhancement allows for 3 hours of contained breathing time when fully charged.

Cost: 15,000 Cr

⚡ **Gear Mounts & Holo Imagers:** As cyberlimbs (Page 33-34, 76) .

⚡ **Genital Sweet:** While the deliberate misspelling is a common joke among Sub-Torso chromers, this suite is a highly sought after enhancement. The sheer amount of different options boggles the mind. Just remember: the rose goes in the front, big guy.

Cost: 20,000 Cr

⚡ **Replacement G.I. Tract:** The pseudo-gastrointestinal tract is a messy, but often welcome option for sub-torso chromers. Processing normal food (and the pleasure of eating) makes the chromer happier and more settled as opposed to requiring the slurry mixture for sustenance. This modification also allows sub-torso chromers to share foodstores with baselines. Wastes generated by the system are condensed into a ‘brick’ and rendered (olfactorally) inoffensive with special bacteria that also cleans the piping. For the record: yes, it is self-wiping excrement that doesn't stink.

Cost: 35,000 Cr

Cybernetic Replacements

/// **Rides:** This enhancement replaces the bipedal frame with a vehicle frame (or “ride”). Use the “Changing Frames” rule for Cyborgs, using a TL 11 LSU as the base (see Page 120). The width of these rides is a standard 1.25m (or less), and the ride plus the upper torso/head stands at approximately the chromer’s height when seated (with a few exceptions). Some rides are wheeled, some use grav and others are based on tracks or even multi-legged animalforms (The “Highstepper” is a kind of centaur-like tall four- or six-legged form, the “Crawler” is lower to the ground and eight- plus-legged). Rides have an inherent cargo capacity about the size of a suitcase (double this for GEV & Highsteppers, triple this capacity for Tracks and Crawlers).

Some rides are capable of travelling offroad (at the percentage of their normal speed indicated), while others are not. The listed speeds are for flat, paved or packed surfaces, some (GEVs) can go over water at full speed (Gravs of course fly). Note that skill checks need only be made when making maneuvers at high rates of speed (defined as anything greater than 40 kph).

Cost: 25,000 Cr for the connections, the “ride” frames are bought separately.



Rides Chart

Rides:	Skill:	Agil.	Speed	Offroad?	Arm	H	S	Cost:
MiniQuad	Drive (Wheeled)	+1	160 kph	25%	5	2	2	5,000 Cr
GEV Platform	Drive (GEV)	+0	125 kph	50-75%	6	2	2	12,500 Cr
Manny-Track	Drive (Track)	+0	80 kph	50%	6	2	3	5,500 Cr
“Brick” Grav	Flyer (Grav)	+1	300 kph	100%	5	2	2	18,000 Cr
Highstepper	Drive (Walker)	+0	80 kph	75%	5	2	3	3,000 Cr
Crawler	Drive (Walker)	+1	45 kph	100%	6	3	3	4,500 Cr

Agil= Agility, *Arm* = Armor, *H*= Hull, *S*= Structure

CYBERNETIC ORGANS

Cybernetic replacement organs date back to over a millennium before 2991, but they have largely been phased out in common practice by the development of bioreplacement and bionic technologies. Still, cybernetic implants certainly *can* be made for organs, and can even be used on a widespread scale in some extreme circumstances. During the recent Mutant War for example, the need for replacement organs and the ability to supply them were out of step. During periods such as this, cybernetic replacements can be churned out quickly by robotic assembly lines. A great many Mutant War veterans, even “now” (2991) over a decade after the end of the conflict, have cybernetic implants simply because they have ‘fallen between the cracks’ after being implanted with cybernetics as a stop-gap.

Functionally, the below replacement organs perform identically to the normal form of these organs. Advanced versions of cyberorgans to exist, but these are often folded into Accessory Packages or listed as Singular Accessories. Cybernetic replacement organs cost less in the short run, but require much higher costs in the long run when immunosuppressant drugs and regular maintenance are considered over the long term. Cybernetic organs require yearly upkeep amounting to 5% of the initial costs (usually spread out in monthly or quarterly payments, reflecting a lot of extra preventative maintenance and pharmaceuticals). These tests are an advanced version of the standard maintenance check used for most cybernetics, including diagnostic nanites to perform system checks and fine tuning. Surgical costs are listed separate from the actual implants (unlike many other cyber-replacements and accessories).

Cybernetic Organ Chart

Specific Organ	DM	Cost	Surgery	Upkeep/Yr.
Heart	-2	50,000 Cr	20,000 Cr	2,500 Cr
Lungs	-4	22,500 Cr	20,000 Cr	1,125 Cr
Liver	0	20,000 Cr	10,000 Cr	1,000 Cr
Kidney	0	15,000 Cr	10,000 Cr	750 Cr
Pancreas	-2	25,000 Cr	10,000 Cr	1,250 Cr
Intestines	+1	30,000 Cr	15,000 Cr	1,500 Cr
Stomach	+2	17,500 Cr	10,000 Cr	900 Cr
Reproductive	-2	37,500 Cr	15,000 Cr	1,900 Cr

Note: While there is no reason to “learn” how to use the cybernetic internal organ, healing times from the grafting/implantation operation are doubled (8+d6 days).

CYBERNETIC INTERCHANGEABILITY

Cybernetic limbs (and to a much lesser extent sensory organs) can also be “swapped out” by their users without surgery. This is another significant advantage of the cyberlimb over their bio-replacement/bionic counterpart.

Exchanging Limbs:

Disassembly/reassembly requires approximately 3+d6 minutes assuming a willing participant (double the time or more for an unconscious participant since the body has to be moved around significantly; *public service reminder*: jacking cybernetics is a serious crime. No, really). Some cyberlimbs anticipate this, and for +575 Cr incorporate “quick-cuffs” to their basic design, allowing a full-round action to be used instead for detachment and 1 minute for limb attachment/re-attachment.

- ⚡ If the user has had the chance to “work in” the new limb previously, a task requiring about d3+2 days of use, there is no DM on tasks done with that limb.
- ⚡ If the limb has *not* been ‘put through the paces’ first (used for d3+2 days), there is a -2 DM to actions with that limb because of the unfamiliarity (-1 DM if the limb is of the same make and capabilities, i.e. a close “copy” of the character’s own limb, as there are usually minor differences that must be hammered out by the co-processor system inside of the cybernetic).

Preparing Unworked Limbs , the Easy Way

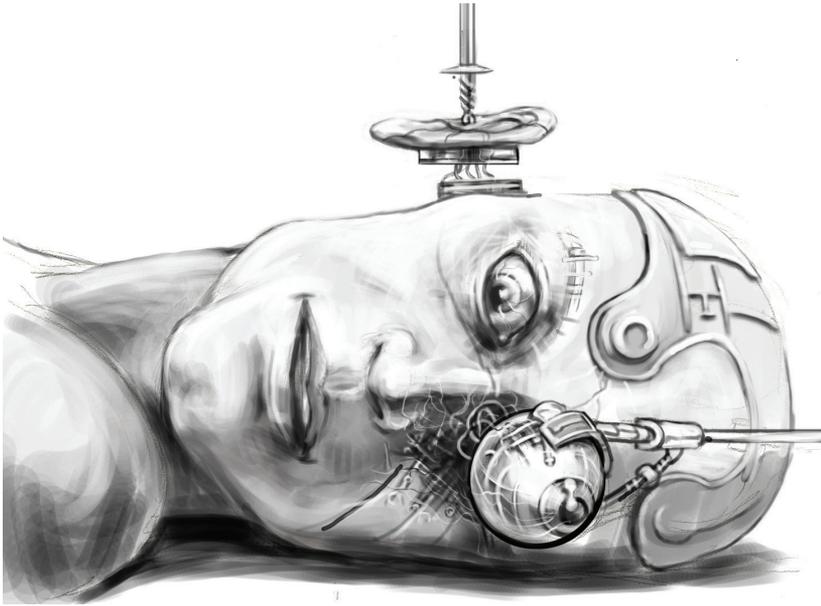
Characters who like to tinker can “read-in” the movement co-processor data from their usual (already “worked in”) cybernetic to speed up “work in” time enormously (reducing it to the results of the following table...)

All that is required is a *Computers 0* skill or higher and a length of datcord:

- ⚡ **Task: Read-in the ‘old’ movement co-processor into the ‘new’ cyberlimb for maximum interchangeability (Cybernetics).** *Life Science (Cybernetics) or Trade (Cybernetic Production)*, d6 minutes, Education, Average (+0)

If the ‘new’ cyberlimb is not exactly the same as the ‘old’ cyberlimb, add one of the following situational modifiers:

- ⚡ **Exact Same type of Cyberlimb** (same enhancements et al): +0 DM
- ⚡ **Same basic type** (baseline limb to baseline limb) **1-2 different subsystems**: -1 DM
- ⚡ **Same Basic type with more than 2 different sub-systems**: -2 DM
- ⚡ **Similar type of Cyberlimb** (baseline to a faux limb, Thick to Thin tentacles): -3DM
- ⚡ **Totally different type** (baseline limb to Finelimb) **of cyberlimb**: -4 DM.



Exchanging Sensory Organs

Only about half of the systems are able to be “externalized” (the eyeball, some of the interior workings of the ear). Thus exchanging one specific component for another does not necessarily grant expanded abilities. Also, only the identical type (and model) are perfectly interchangeable (Referee’s discretion). Beyond that, the disassembly/assembly and “work in” modifiers are identical.

Cybernetic Processor Read-in Chart

Effect	Time Interval	Notes
-3 or less	unchanged (d3+2 days)	assumes ‘new’ limb restarted at basic values. The ‘old’ limb data must also be wiped.
-2 to -1	unchanged (d3+2 days)	assumes ‘new’ limb is cleared, old settings are retained.
0	d2 days	Data very helpful, but the co-processor still has little glitches
1 to 2	6+d6 hours	Useful data, allowing minimal optimization time.
3 to 4	d3+2 hours	Solid synchronization, still have a few ‘kinks’
5 or more	d3+2 minutes	Perfect synchronization, down to the most delicate values

MAINTENANCE CHECKS AND OVERHAULS (OPTIONAL RULE)

One of the major disadvantages of cybernetics is that they have to be maintained over time. The Upkeep costs for cybernetic organs are listed on page 42, but cyberlimbs and sensory organs are a different (and generally less expensive) matter. Systems will start to get out of whack as soon as they are implanted and properly synced, standard use will make the cybernetic have to be submitted to six-month checks. "Standard use" is not what most characters subject their cybernetics (and themselves) to in the field. Assume that the sedentary individual might have to get this checked only once per year. An "active" individual gets a checkup 2-3 times per year. A "standard adventurer's" checkups would be every 3-4 months, but the roughest uses the cybernetic is put to (outside of outright direct damage) will require the **Maintenance Check** to be done monthly.

If the Maintenance Check is simply not done the character will go 2d6 days post-checkup before they get a -1 DM on all use of the cybernetic as the system starts to deteriorate. If the character persists, every d3 weeks later will result in a further -1 DM. Too long a delay may require an overhaul instead of a checkup (Referee's discretion).

The checkup ensures that the integration net is still in good condition and that the hardware works properly. If the maintenance is done by a qualified specialist, they run 200-250 Cr (*caveat emptor*) and Referees may assume that they are a success. They may (especially if searching for the cheapest rate) be rolled out at the Referee's discretion (190+d6x10cr). If the player wishes to perform the Maintenance Check on their comrades (or even on themselves with a -1 DM), the procedure costs nothing with the right equipment (an electronics kit and a cybernetics kit are generally sufficient).

Roll a *Life Science (Cybernetics)* check to make adjustments to both that will prolong hardware longevity and maintain the replacement in good order.

◆ **Task; Resync Cybernetics:** *Life Science (Cybertechnology)*, Intelligence or Education, 10-60 minutes, Average (+0); with a DM to the check determined by how much use it has had: average non-adventuring use = +0 DM, some hard use (usual adventure stuff) -2 DM, sustained hard use (tough adventures) -4 DM, utterly abusive (hellish adventures) -6 DM.

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Using replacement parts and new components can provide some assistance on the test, this costs $d6 \times 100cr$ and nets a +2 DM on the Check. If the **Re-Sync Cybernetics** task fails by an Effect of -3 or worse, the character has a -1 DM to use the cybernetic until they get an overhaul and a -2 DM on all maintenance checks until the overhaul is performed.

An **Overhaul** is a major replacement/reconstruction. Most chromers do not have to have an overhaul unless they have suffered from major damage by some accident (like, the introduction of high velocity lead projectiles, crushing under debris etc). A successful overhaul restores the cyberlimb to its original conditions.

Overhauls for an implant that must be removed can be done for $\frac{1}{4}$ cost of the cybernetic (minimum, see "Perform Overhaul": task below) plus $7,000+(d3 \times 1000)cr$ (to cover implantation/surgical fees). The surgical portion is not always required, as most limbs can be taken off without surgery, as can eyes and ears (depending on what got damaged), although internal organs and many Accessories clearly cannot be accessed without surgery. As always, this is at the Referee's discretion.

◆ **Task; Perform Overhaul:** *Life Science (Cybertechnology)*, Intelligence or Education, 3+1-6 hours, Difficult (-2). If the damage is particularly bad, the cost of the overhaul ($\frac{1}{4}$ the cybernetic) should be increased, not the skill check (since they are replacing damaged areas anyway).

Note that this is where the utility of TL 8- cybersensory organs come into play, as the task can be performed with *Mechanics* skill as long as the one performing the task does a re-Sync Task (the maintenance check above) afterward to link the cybernetic back into the individual.

Medically-inclined characters who can help their fellows with the surgery can shave the medical costs down to 2-4,000cr (which is basically consumables and drugs needed for the operation). This also requires them to make the following check.

◆ **Task; perform cybernetic surgery:** *Medic*, Education, 10-60 minutes, Difficult (-2); the task duration cannot be moved up or down, this is what it takes].

A failure of the check inflicts double the negative Effect in damage on the subject, an Effect of 3+ adds +1 DM to the Cybernetics/Sync check; **Note:** for some overhaul jobs (a cyberlimb mangled below the coupling point) surgery is not required in the first place.

BIOLOGICALS

While some old lexicons still use the terms “bionic” and “cybernetic” interchangeably, the systems were differentiated with the advent of synthetic biological tissue suitable for grafting (often referred to under the general heading of “Biologicals”). The technology was pioneered in the 25th century (TL 10) and has continued apace since that time. By the 30th century, synthetic materials have been refined to the point where this technology can literally duplicate a natural limb with precision (Bio-Replacements) or create better-than-original parts fused with cybernetics (Bionics). Bionic and bio-replacement “chrome” (the term is still applied here) *must* be made for specific individuals, in order to match their DNA to avoid immunological problems using component parts (grown separately, combined by the designer).

Biotechnologists are considered artisans, and some are considered artists. Implantation must be performed by competent medics trained specifically for this kind of surgical procedure, although the surgeries are considered simple affairs and by the 30th century, only require 4+d6 days (limb)/2+d3 days (sense organ) of recovery to restore statistics and avoid infection. The individual implanted must re-learn how to use their new limb/sense organ, which is a much longer process taking many weeks: d6 weeks (limb)/d3 weeks (sense organ). Until this time, the character has a -2 DM when using this new part. This is also the time that muscles need to be grown and retrained.

Sharp-eyed readers will note that there is a difference between biologicals and cybernetics in the amount of time required to eliminate the penalty. Recall that cybernetics have built-in co-processors that essentially meet the chromer (more than) half-way when trying to learn how to use the cybernetic. The processor begins to anticipate what the character wants as they are learning. Also, natural muscle tone of biologicals must be “worked in” to be of much use, unlike servos and artificial myomers. Many who have had new replacements use mobilizers (see page 96) to help them move their limbs normally and avoid the negative DM. Eyes and ears will have fewer problems, especially if they are not bionic, reducing sense checks relying on the replaced organ by -1 DM (and -2 DM for any use of unfamiliar bionic components).

Specialists do exist that help reduce this time significantly however, halving the base time as well as reducing the number of days (not weeks) further by twice the Effect of the specialists’ *Instruction* check. If the character paid for the implantation, the specialists are part of the

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package. Basic functionality is learned fairly easily, within the first quarter of this period, but characters will be at -2 DM to use the limb/organ in combat and -4 DM to use any enhancements until they have time to relearn the basics. Referees are free to reduce these penalties according to the amount of time that the individual has already been training at (and to) their discretion if the character is forced back into action prematurely.

TECHNICAL DETAILS

Implantation surgeries for biologicals are performed by Medics who not only use their *Medic* skill, but also *Life Science (Biotechnology)*, while Bio-Designers use *Life Science (Biotechnology)* and *Trade (Biotechnology Processing)*. Normally, these personnel are assumed to perform their functions behind the scenes with competence, but characters who wish to do some of these tasks themselves may do so.

The surgery can only take place however when the parts become available. Biologicals must be first grown for that specific individual (to prevent rejection). An **arm-replacement** takes a base of 2d6 weeks to grow; a **leg-replacement** takes a base of 2d6+2 weeks to grow. **Eye- and ear-replacements** are much simpler (and involve less mass), and can be grown in d3 weeks. (See chart at right)

Why such a long period? Why such a wide range? This has to do with the method used for growing these tissues (see sidebar, next page). In some cases, these parts (or sections thereof) have to be scrapped then re-grown more than once to avoid/repair/replace replication errors, tissue mutation and similar problems. This is one of the difficulties of speeding up the process, as opposed to taking nine months in the womb for the basics and nearly two decades for slow development.

If the character wants to create a *bionic* organ or limb (See "Types of Biological Replacements"; page 52) then the growth times must also incorporate the altered elements. This generally adds d3 weeks to limbs (or +1 week to organs), much of which is spent designing and connecting "new" elements so that the biomatrix accepts these components.

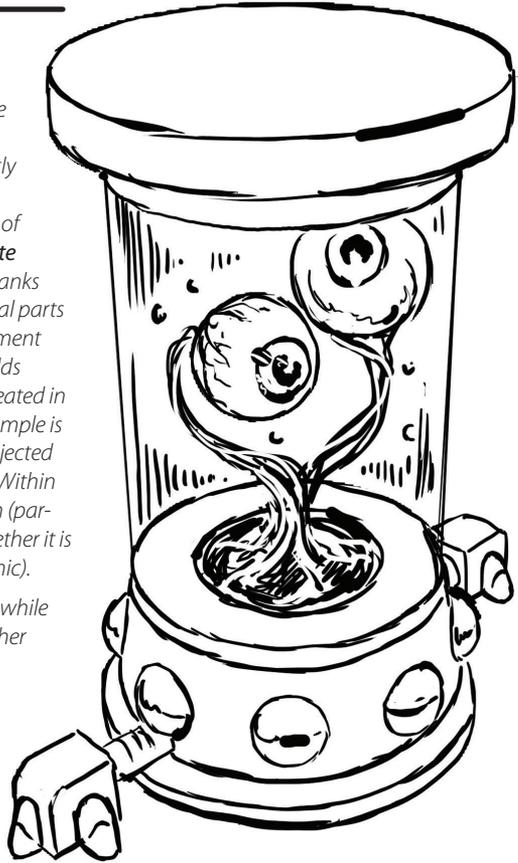
Characters in a hurry can roll **three** growth time results for an additional 25% of the base cost (before enhancements). This is the equivalent of setting up more growing cultures than necessary (beyond the normal redundancy) and picking the fastest-growing from the 'crop' to actually use.

For example: *Josh's character loses an eye during the game. Josh wants the eye to be "natural" and thus the character decides to pay the "long credit" for a Bionic (base 96,000 Cr for a single eye). But the Referee says that the next adventure has to take place in 3 weeks, so*

Parts is Parts

*Bio-Growth tanks, like the one shown here in which eyes have been cultivated, allow for the development of tissue efficiently and economically. In a system far-too-similar to the growing of Synthmeat (see **Setting Update Beta**, pg. 22-23), bio-growth tanks allow for DNA tailored biological parts to be produced for bio-replacement and bionic uses. Forms or moulds produced for these parts are created in nanoweaves, then the tissue sample is taken from the subject and subjected to proprietary cell stimulation. Within several weeks, the part is grown (partially or fully depending on whether it is to be a bio-replacement or bionic).*

Unfortunately, the technology, while extremely handy, is not altogether perfect. Mutations sometimes creep into the finished product (although these are rooted out ruthlessly by biotechnicians, it can make the process take much longer by forcing a re-growth of the part).



Biologicals Growth Times/Costs/Recovery Chart

Bio-Replacements

Part	Cost, Single	Cost, Pair	Growth time	Recovery	Full Use
Arm	150,000 Cr	300,000 Cr	2d6 weeks	4+d6 days	d6 weeks
Leg	150,000 Cr	300,000 Cr	2d6+2 weeks	4+d6 days	d6 weeks
Ears	42,000 Cr	60,000 Cr	d3 weeks	2+d3 days	d3 weeks
Eyes	56,000 Cr	80,000 Cr	d3 weeks	2+d3 days	d3 weeks

Bionics

Part	Cost, Single	Cost, Pair	Growth time	Recovery	Full Use
Arm	200,000 Cr	400,000 Cr	2d6+d3 weeks	4+d6 days	d6 weeks
Leg	200,000 Cr	400,000 Cr	2d6+d3+2 weeks	4+d6 days	d6 weeks
Ears	63,000 Cr	90,000 Cr	d3+1 weeks	2+d3 days	d3 weeks
Eyes	96,000 Cr	120,000 Cr	d3+1 weeks	2+d3 days	d3 weeks

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the grumbling player adds 24,000 Cr more (¼ of the base cost) and rolls three growth times for a total cost of 120,000 Cr (before any enhancements). One of the three d3+1 rolls (since this is a bionic eye) for the “growth time” comes up as (1+1) 2 weeks. Perfect.

Once implanted, the character must heal, which takes 2+d3 days (the roll is a 3, taking up 5 days and only leaving 2 days to start ‘re-training’ the eye before the adventure). After this, the character has to “work in” the eye, which will take d3 weeks (the roll indicating just 1 week). Because this is already the minimum amount of time allowed for retraining the eye, there are no benefits for using retraining specialists (see bottom of page 47). So, any vision checks made during the first 5 days of the adventure are at a -1 DM (basic use of the eye, or a -2 DM for a bionic enhancement).

I MADE YOUR EYES

The character makes a Task Chain roll starting with *Life Science (Biotechnology)* then *Trade (Biotechnology Processing)*. The level of success determines how functional the limb or sense organ will be once completed. Doing the work themselves, the character can save **half** the cost of the Bionic (the other half is spent for parts and equipment in batch work, plus the surgery costs).

- ◆ **Step One: Biological Design** The genetics have to be dealt with, especially for bionics, but even for bio-replacements adjustments have to be made. **Task: Bio-Design:** *Life Science (Biotechnology)* or *Trade (Biotechnology Processing)*, Intelligence, variable time (see below), variable difficulty: based on what is being produced, *Bio-replacement: Average (+0)*, *Bionic without cyber-components: Difficult (-2)*, *Bionics with cyber-components: Very Difficult (-4)*.
- ◆ **Step Two: Growing Process.** This involves the actual growth process, constant monitoring is required. **Task: Bio-Growth:** *Life Science (Biotechnology)* or *Trade (Biotechnology Processing)*, Intelligence, variable time (see below).

Combined Time: Amateurs spend d3 months to design and grow biologicals (which gives more than enough time to work on any non-organic components separately) using a chemistry or biology lab.

Alternatively, the time could be as little as the listed number of weeks (Page 49) as long as the designer has the proper equipment (a full-fledged growing facility, specializing in this type of work, not cheap) and expertise (at least *Trade (Biotechnology Processing)* 2 or higher).

Bio-Reconstruction

Just as cybertechnology can be used to repair the results of accident/injury, so too can biological/bio-replacement technology (and to a more limited extent, bionic tech). The costs for "Bio-Reconstruction" are higher: 25,000 Cr/point as opposed to 10,000 Cr for Cybernetic Reconstruction *at the time of character creation* (see below for post-creation costs), but the results are a true restoration, not just of function (which can be done with cybernetics) but appearance and "feeling" as well. This makes bio-reconstruction a considerable draw to the general public, who have embraced it wholeheartedly where (due to costs) possible.

Bionic-Reconstruction (bionics, or using altered components, as opposed to Bio-reconstruction, using exact replacements) can produce some interesting visual results: a repaired jawline that is a different skin color or texture (red scales with scintillating gloss for instance). In practice however, this is generally avoided in the **Twilight Sector Setting**. This is because of the very real likelihood that the Bionic Reconstruction will be mistaken for a mutation, subjecting the character to a serious social penalty. Other settings may not have this issue however.

Cost: 50,000 Cr/point during game-time to repair accident/injury using bio-replacement technology. This pays for both the growing of parts and the surgery. If the character can design/build biologicals subtract 20,000 Cr/point from this cost, and subtract a 5,000 Cr/point if they can arrange surgery. Thus if they do all the work themselves it is still 25,000 Cr/point (for supplies).

Grafting for Fun and Profit

Another character or trusted ally may elect to perform the surgery to graft the bionic part onto the subject. This constitutes two checks and costs 2,000 + (d3x1000) Cr in medical supplies. This saves approximately 15,000 Cr in surgical cost (on average, like Cybernetics Referee Discretion).

- ◆ The surgery itself is a *Medic* check [**Task; Perform Cybernetic Surgery:** *Medic*, Education, 1-6 hours, Difficult (-2); the task duration cannot be moved up or down, this is what it takes]. A failure of the check inflicts double the negative Effect on the subject; an Effect of 3+ adds +1 DM to the Sync check.
- ◆ The **Systems Sync** is to ensure that the bio-replacement system is integrated with the user. [**Task; Sync Patient to Implant:** *Life Science (Biotechnology)*, Intelligence or Education, time same frame as Surgery, Difficult (-2)].

The second check should be made in secret; a *Failure* indicates that the Bio-Replacement implant will fail sometime after implantation. A *Marginal Success* indicates that the time to get used to the bionic part is 2d6+3 weeks and one of the features never works properly if enhancements are designed into the bionic part. *Success* indicates the sync process worked well, reduce the amount of time rolled to "retrain" the Biological by double the Effect in days (minimum is 2 weeks for limb, 1 week for a sense organ).

TYPES OF BIOLOGICALS

There are two forms of biological technology: 'simple' bio-replacements and full bionics. Once again, those with biological replacements are still referred to as "chromers" despite the fact there is far less metal involved.

Bio-Replacements

Bio-Replacements are the most "simple" form of this technology, allowing the grafting of a "new" biological limb or sensory organ. These are grown in sections and combined together by artisans to individually fit each user (which accounts for their high costs). A bio-replacement will work and act as the original, and in most cases is relatively hard to detect on casual inspection, even by experts.

◆ **Task; Detect Bio-Replacement:** *Life Science (Biotechnology) or Life Science (Anatomy)*, Intelligence or Education, 10-60 seconds, Very-Difficult (-4)

Examination with the proper gear makes this much easier to determine (Add +4 DM if they have the right equipment to detect microsurgery).

The base Strength and Dexterity of the limb are the same as that of the character, as any alterations of these characteristics would amount to a bionic replacement instead.

Bionics

Bionic replacements however incorporate not only the biological components that mimic the originals, but new components that surpass them. Sometimes these changes are made from upgrades, such as variations of the biological tissues (stronger muscles, more durable nerve connections); and sometimes by adding artificial or cybernetic components designed to work in tandem with the altered physiology. The task to detect bionics is the same as bio-replacements but easier:

◆ **Task; Detect Bionic:** *Life Science (Biotechnology) or Life Science (Anatomy)*, Intelligence or Education, 10-60 seconds, Difficult (-2).

The base Strength and Dexterity of the limb are the same as that of the character, unlike Bio-replacements Strength can be enhanced (there is no need to enhance dexterity since it starts at parity with the character and there is no manifest benefit to having a higher Dex limb). Unfortunately, with biologicals such as bionics, there is less that can be done about bulk (and the loss of Dexterity).

SENSORY REPLACEMENT/ ENHANCEMENTS

Simple Bio-replacement Sense Organs Cost: 80,000 Cr (eyes, pair), 56,000 (eye, single), 60,000 Cr (ears, pair), 42,000 Cr (ear, single). As with cybernetics, grafting in a single bio-replacement (or bionic) costs slightly more than half. Here it is because the economy of scale is off (growing two and growing one aren't very much different in terms of the growers/manufacturer's costs since most of the work is done in the DNA matching technology).

Bionic-capable Sense Organs Cost: 120,000 Cr (eyes, pair), 96,000 (eye, single), 90,000 Cr (ears, pair), 63,000 Cr (ear, single). The bionic replacement may *accept* sense modifications (Note the cost listed does not *entail* any bionic enhancements, it simply makes the sense organ *suitable* for them).

The primary advantage of bionic sense organs is that they can be made to incorporate "natural" enhancements (in some cases, not all). Most of the enhancements provided to cybernetic sensory apparatus can be applied to their bionic equivalent, including HUD linkage which is essentially a cybernetic link buried in the otherwise organic(-ish) eye. Another common modification is the ability to perceive other wavelengths. For some chromers, the bionic equivalents of certain sensory enhancements are similar to those of cybernetics (like the HUD feature, which basically is the same as that of a cybernetic implant, just integrated into an otherwise biological sense organ), but others, like wavelength adjustment and "zoom" require users to adopt all new physical habits. For example, engaging telescopic vision (part of the image amplification suite) is linked to a new muscle which alters the shape of the back of the eye and cornea rather than simply "panning in" on a smaller field of vision (which is how the cybernetic version does this); bionic users must learn to develop these muscles and the finesse to control them (this is why it takes a few weeks to gain mastery).

- /// **Balance Enhancement (bionic ear):** Inner ear function can be improved to give the chromer a much better sense of balance. +2 DM to any task that involves balance (usually *Athletics* or *Dexterity* tests when moving over unsteady or narrow surfaces).
Cost: +17,500 Cr
- /// **Digital Audiolink (bionic & bio-replacement/natural ears):** This is an implant that is designed to allow the chromer to "hear" digital signals directly through the implant. This can be added to a natural

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ear or grafted onto a grown bio-replacement ear without the need for full replacement.

Cost: +12,500 Cr (for bionics), 25,000 Cr (for bio-replacements/natural ears, which accounts for surgery). Note that for 35,000 Cr (total) normal ears or bio-replacements can be given audiolinks and hearing adjustments at the same time.

- /// **Image Amplification (bionic eyes):** These bionic eyes incorporate a range of features that have been derived from various species or designed carefully by genengineers to maximize sense performance. "Zoom" features for example by changing the dimensions of the eye itself using special muscles and more flexible material, more photoreceptors and the like. The user can see five times further than normal and has a +2 DM to any sight-based sensory checks. The chromer can see ten times further than normal if they concentrate (spend a minor action every turn).

Cost: +35,000 Cr

- /// **Hearing Adjustments (bionic & bio-replacement/natural ears):**

This is a cybernetic implant that is threaded into the biological system. It is one of the few adjustments that can be made on natural and bio-replacement ears without paying for a 'bionic' sense organ; it can also be added after the bio-replacement is grown (i.e. just like it was a natural ear being provided with this adjustment). The implant amplifies sounds for the user, doubling hearing range (2x) and includes filters to help prevent damage from loud sounds (cancelling out the increased hearing, i.e. they are no more or less susceptible than those with 'normal' hearing). *Note: may not be combined with Reception Tracking (since that uses something similar but more advanced).* If the ear is grown "abnormal" (larger, oddly-shaped, or obviously/exaggeratedly pointed) the hearing range can be increased to x4, but the user will be marked (many casual observers will assume they are a mutant, with all that comes with this assumption).

Cost: +12,500 Cr (for bionics), 25,000 Cr (for bio-replacements/natural ears, which accounts for surgery). Note that for 35,000 Cr (total) normal ears or bio-replacements can be given audiolinks and hearing adjustments at the same time.

- /// **HUD (bionic & bio-replacement/natural eyes):** The Bionic Heads-Up-Display works in operation just like the cybernetic version, but consists of a cyber-implant which can be spliced into the optic nerve (or if a bionic, the eye is grown around the implant). Note that this is one of the few bionic adjustments that can also be done for natural eyes or straight bio-replacements without

Biologicals: Bio-Replacements & Bionics

the added expense of making the eye 'bionic' (or in the case of a natural eye having it replaced with a bionic version).

Cost: +12,500 Cr (for bionics or replacement eye at the time when it is being grown), 25,000 Cr (for grafting the necessary components to natural eyes, which accounts for surgical costs; a bio-replacement eye that is grown with these components does not have to pay this amount, one that is modified "aftermarket" would).

- /// **Noise buffering (bionic ears):** These ears can automatically tamp down loud noises and such before they can damage the inner lobes or cause too much trouble for the chromer. If the chromer has some form of amplified hearing (like the Reception Tracking ability), this merely makes them no more susceptible to loud noises as the normal hearing population. If the chromer does not have amplified hearing, this component effectively gives the equivalent of ear protection.

Cost: +20,000 Cr

- /// **Reception Tracking (bionic ears, pair only):** This bionic adjustment requires ears to be shaped differently, usually longer and pointed (these can be 'elf ears' or 'dog ears' most chromers choose 'elf'). The ears themselves are also more flexible than human normal ears, and a coating on the inside helps to trap sound better than flesh. The adjustment adds a score of new muscles to the ear to allow for movement of these ears (this is the 'tracking' part). All together, this modification allows better tracking and more "long range" hearing (the chromer can also hear softer sounds that are coming from more distant places). Range extension is five times (5x) normal human hearing (noises normally only heard up to 2m away can be heard as far as 10m away) if the chromer takes the effort (spends a simple action every combat turn this is used), or ten times (10x) if they fully concentrate (uses a significant action every turn, meaning they perform no other actions as they listen). Also, clarity is improved +2 DM to hearing-based sense tests, and the cost of wavelength adjustment is reduced by half. The ear however is now obviously different (use detection as an "obvious" cybernetic ear: giving a +2 DM to those who are looking at the ear at close range). Consider noise buffering strongly.

Cost: +45,000 Cr.

- /// **Retina Shifting (bionic eyes):** The eye contains broad-spectrum pigments that allow the chromer to shift their eye color. While natural, these shifts are actually amazingly quick (a second or

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two) because they are based on the color shifting genetics of various Terran and Exoterran color-shifting species. Different manufacturer's produce different color palettes. The character should signify what **common** color their eyes *cannot* match rather than the dozens of shades that they *can*.

Cost: +8,000 Cr.

/// **Wavelength Adjustment (Both):** The eye or ear is adjusted to be sensitive to any one of several wavelengths. In practice this is *exactly* the same as the cybernetic equivalent because it uses cybernetics grafted onto the biological components to achieve the results.

Cost: See chart on page 23 (cybernetic versions) with an additional +10,000cr for the grafting process (in total, so multiple wavelength adjustments can be pooled together first for a lump sum *then* add the 10,000 Cr).

Example: A character wants to get Wavelength Adjustments for their new Bionic Eyes (infrared and ultrasonic), as well as a HUD. Because they are buying a pair of eyes, the cost is 120,000 Cr (pair of eyes) + 2,500 Cr (HUD) + 21,000 Cr (1,000 for infrared, 10,000 for Ultrasonic and an additional 10,000 for the hardware that allows the bionic eye to pickup/interpret these inputs, had the character wanted to add a third wavelength, such as Thermographic, they would have had to pay just 2,5000 Cr more)= 143,500 Cr.

What About Tentacles & Sub-Torso Replacements?

While both of these replacements are possible, they are generally shied away from in the Twilight Sector Setting. Both Biological Tentacles and Bionic Sub-Torso Replacements are well within the technology of the setting, but smack far too much of mutant traits. In other settings, or when the mutant issue doesn't matter...

Tentacles: Use Cybernetic Tentacles as a base, including thicknesses and costs for given tentacle lengths (+25% to Cost). Use the *cybernetic* table (rather than the bionic table at the right) to determine enhanced limb Strength and Dexterity. Bionic tentacles can mount all Bionic limb enhancements (charged as per Bionics).

Sub-Torso Replacement: Bio-Replacement technology can restore the lower torso of the user completely, bringing them back to the state they were before they were damaged. This however takes a long time, as the various sections have to be laid in sequentially, healed before the next graft and so-forth. The combined growth times and rest & recovery periods are around 240 days (+/- 2d6 at Referee's discretion) and the total cost (parts and surgeries) for a full bio-replacement is 3.25 Mcr.

Bionic versions of Sub-Torso Replacements veer very quickly into the strange and outré. These are generally costly, and are best handled by Referee fiat than any hard and fast rules (although future subjects may profile Centaurs or other mods).

LIMB REPLACEMENT/ENHANCEMENT

Simple Bio-replacement Limb Cost: 150,000 Cr. The base Strength and Dexterity of the limb are the same as that of the character, no further adjustments (even to strength or dexterity) are possible.

Bionic-capable Limb Cost: 200,000 Cr. The base Strength and Dexterity of the limb are the same as that of the character. The Bionic can *accept* limb modifications (these limbs are also automatically *Reinforced* if they have Enhanced Strength, see page 30).

Limb enhancements for bionics tend to be much less “impressive” than cybernetic equivalents. Even systems which are only *partially* biological are not designed to telescope or (suddenly) change their position in radical ways. Most of the changes are transparent to the game mechanics, such as slightly better range of motion,

Adjust	Strength Enhance (bio)	
	Str Cost	Bulk
+1	10,000 Cr	None
+2	15,000 Cr	None
+3	20,000 Cr	-1 Dex
+4	35,000 Cr	-1 Dex
+5	50,000 Cr	-2 Dex
+6	75,000 Cr	-2 Dex

natural double-jointedness and freedom from lingering knee/elbow ache in more (ahem) seasoned users. **Base strikes for bionic limbs are d6+2, grapples are unchanged.** The most common enhancement boosts the Strength of the limb above “normal” while retaining the limbs original appearance as much as practicable (it is easier to detect the bionic replacement: +1 DM for the detection tests with each added point of Strength). Note that limb Dexterity starts at the same as the user, and excess bulk *cannot* be offset.

⚡ **Extension Claws/Talons:** A talon can be extended from the long bone of the forearm made from high-density bone and razor sharp organic components. Claws (which can be made retractable) extend from the fingertips. Combat rolls made with the talon use *Melee (Blades)* while the claws use *Melee (Natural Weapon)* skill. The Blade does strike+d6 damage while the claw does strike+2 damage.

Cost: 25,000 Cr. (Talon), 10,000 Cr (claw), 15,000 Cr (retractable claw)

⚡ **Extreme Articulation:** By re-designing the joints of the limb, a decidedly “unnatural” amount of flexibility can be provided, well beyond double jointedness. Elbows and knees for example can be cocked backwards to point the forearm/hand or shin/foot in the opposite direction et al. A +3 DM can be provided to free an arm or leg caught in a hold, other benefits at the Referee’s discretion.

Cost: +12,000 Cr Note: this makes the arm/leg much easier to spot, change the base difficulty of the **Detect Bio-Replacement** task to Routine (+2) all other detection adjustments apply.

Techbook: Chrome

- /// **Forearm Shroud:** The bones of the hands and forearm are thickened and strengthened, allowing the bionic user to parry lethal melee weapons using their unarmed combat skill. Often the skin and muscle of the forearm are also made from synthetics designed to take extreme punishment. Add +2 to *Melee Skill* for Parrying efforts (+3 versus an unarmed opponent). Forearm shrouds will have to be replaced regularly with use. This modification also increases the damage of an attack with the limb to d6+4 rather than d6+2.

Cost: +50,000 Cr during production, but degrades after being used for several defensive maneuvers (Referee's discretion) and must be replaced for 20,000 Cr (which includes the costs of implantation and the materials together). *Note: a forearm shroud cannot be placed on the same limb that has a talon, but can be placed on a bionic hand with claws (total strike damage: d6+5).*

- /// **Improved Simulation:** Just as the cybernetic section, this reflects an effort to condense as much as possible to fit in excess mass (like organic myomers or minimizing grafts).

Cost: 15,000 Cr/-1 to detection test, up to -4.

- /// **Injection Ports & Medicinal Glands:** See Accessories section under "Injection Ports" (pg 67) and "Medicinal Glands" (pg 77). These are commonly grown already in biologicals to save the costs of separate surgery (i.e. do not pay the 10,000 Cr for implantation). Like the Cybernetic version, Bionics may use Injection Spikes (pg 34).

Cost: See pages noted, reduce implantation costs (-10,000 Cr)

- /// **Redesigned Hands/Feet:** There are a number of possible benefits to redesigns of the hands and feet. The specifics of the redesign (added fingers, thumbs, different spacing, extra joints, etc) are myriad and best left to the Player and Referee to determine.

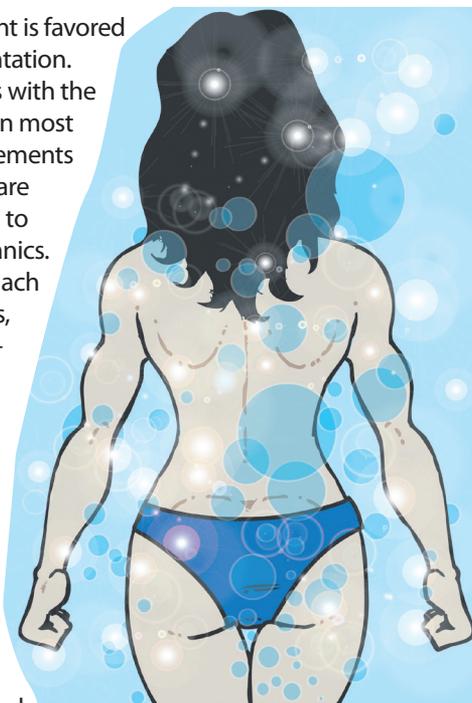
Redesigned Hands: These aid in fine manipulation, giving +1 DM to delicate operations like fine medical procedures, instrument playing, and prestidigitation (or any other action involving fine motion in the hands). This does not aid gross movement, such as physical strikes (although it can help with non-damaging grapples) or aiming a weapon (although it can be added *after* the chromer performs two aiming actions).

Redesigned Feet: These allow the foot to be used for grasping/manipulation as though it were a hand. In order to do so, the redesigned foot must be reasonably free (no boots or shoes, although special foot coverings can be made for them). Referee's may rule a +1 DM appropriate for certain actions (such as climbing)

Cost: 25,000 Cr (Hands); 15,000 Cr (feet). These can be done as partial replacements for non-amputees, using rules from pg. 38

BIO-REPLACEMENT ORGANS

Most of the time, bio-replacement is favored over cybernetic for organ implantation. The organs function more or less with the same efficiency of the originals. In most cases there are marginal improvements but for practical purposes these are generally not significant enough to warrant changes in game mechanics. Never having acid-reflux or stomach aches are admittedly advantages, but not really reflected in a rules-set. There are more “advanced” versions of these replacements, but these are listed either as accessories or (more commonly) as part of an Accessory Package, which combine the efforts of several supercharged organs to produce a wide range of beneficial effects.



Most patients who undertake organ replacement have to spend time in a nanite healing chamber.

Cost depends on what organs need to be replaced, (keep in mind the “Cybernetic replacements and cost” sidebar on pg 14 for why this is higher than amounts charged during character generation). Costs below separate the implantation surgery and the biological replacement (and give base growth times).

Specific Organ	DM	Parts Cost	Surgery Cost	Growth Time
Heart	-2	100,000 Cr	20,000 Cr	d6 weeks
Lungs	-4	45,000 Cr	20,000 Cr	d3+1 weeks
Liver	0	40,000 Cr	10,000 Cr	d3+1 weeks
Kidney	0	30,000 Cr	10,000 Cr	d6 weeks
Pancreas	-2	50,000 Cr	10,000 Cr	d3+1 weeks
Intestines	+1	60,000 Cr	15,000 Cr	d6+1 weeks
Stomach	+2	35,000 Cr	10,000 Cr	d3 weeks
Reproductive	-2	75,000 Cr	15,000 Cr	d6 weeks

Note: While there is no reason to “learn” the cybernetic internal organ, healing times from the grafting/implantation operation are doubled (8+2d6 days).

Techbook: Chrome

Biological Availability & Cost at other Tech Levels

All prices assume a Maintech (9-12) system, where TL 12 bio-replacements are common enough to not have spikes in cost. Bio-Replacements can be grown as low as TL 9, but this costs much more and the functionality is generally not perfected until mid-TL 10.

When it comes to other Tech Levels, there is very little to warrant using inferior product for bio-replacement. In a system which has less than TL 11, the bio-replacements are usually made by TL 11-12 growth tanks and equipment. If this is not the case, increase costs by 100% for each tech level beneath 11 (So the total costs of a Bio-replacement at TL 10 is 200%, at TL 9 is 300%). Lower tech levels may reduce the utility of (or eliminate the possibility of) certain enhancements as well as increase base costs.

In the ***Twilight Sector Setting***, having to settle for sub-maintech biologicals is generally not an issue. The equipment used to perform TL 11 or TL 12 bio-replacements is a common trade item in the setting and the personnel are imminently portable (or trainable). Putting together a maintech facility does not cost *that* much as a capital investment on retrotech and sliptech worlds. This is not to say the equipment and tanks are cheap, but they pay for themselves many times over; especially where the demand is high.

What is more commonplace in the fringes, or retrotech and sliptech worlds, is having to wait longer to receive a "maintech" bio-replacement. This is because there are usually others who are also receiving treatment from whatever machinery does exist (and since more of that machinery cannot be made on the planet, 'care rationing' is all too common). Determining this sort of thing should factor in the planets trading status, the nature of their population, and other 'contingent imponderables' that are best left to the Referee. Those looking for biologicals in backwaters should just remember that there is generally a several week or month wait-time.

MAINTAINING BIOLOGICALS

One of the main advantages of bio-replacement is that they do not have to be maintained, they are organic (albeit artificially) and get repaired like the rest of the body, through natural healing and the occasional beneficent intervention of medical practices.

This is one reason that some employers will pay the extra for biologicals, as the long run cost (over decades) is actually lower when all is considered.

ACCESSORIES

Accessories are Chrome that does not simply replace missing or damaged limbs, organs, or senses, but adds components that provide the chromer with capacities they had not enjoyed up to that point (technically, some of the limb and sensory implants discussed above do this as well).

The time for recovery varies from accessory to accessory (listed in parenthesis after the name). In the case of a temporary accessory, there is no 'recovery' needed. With medicinals, there is a minimum time before the system is fully active (usually in description).

Rather than distinguishing between cybernetics and bio-replacements as with limbs/sense organs, most accessories can be divided into three types, which can include elements of either/both:

- ⌘ **Singular Accessories**, which reflect one implant or a group of the same/similar implants that perform a singular function.
- ⌘ **Package Accessories**, which are often several different implants/grafts which accomplish a goal or range of similar goals;
- ⌘ **Temporary Accessories** are made up of *medicinals* that are eventually destroyed/broken down/flushed out/used up by the system and *applications* that assist/duplicate other implants.

Terminology

Some terminology used in the descriptions of specific accessories suggest how some of these implants are installed:

- ⌘ **Implants** are new/foreign elements added into the body, such as the plugs used for neural plugs or the electronic gear in integrated computers or co-processors. Most are cybernetic in nature.
- ⌘ **Grafts** are alterations to the existing structures by gross methods, such as adding the knot of dense brain tissue analogue used for Memory Shunts (see **Tinker, Spacer, Psion, Spy**, pg 13 and page 78 of this book) by microsurgery. Most, but not all, grafts are bionic in nature.
- ⌘ **Nano-enhancement** techniques use nanites to augment or enhance the physical properties of the body, such as to stimulate brain cell reproduction or "Latticing" neural pathways to improve signal transmission and increase manual dexterity. The nanites do not stay in the system. Instead, they facilitate these changes, which are in turn permanent. This is often the most time-consuming part of longer implantations, requiring the chromer to stay inside of a fluid-filled tube that is regularly infused with the nanites. (these are sometimes also known as "healing tubes". Often the chromer is kept sedated during the process, which could take up to several months.

SINGULAR ACCESSORIES

A singular accessory is chrome that does a specific thing. Some of the following are closer to Package Accessories, but since they are generally incorporated into similar tissues/organs and do just one job they are listed here (also, because they do not interfere with the “no two packages” rule). After each entry is the number of days that are generally required to acquire the modification, combined vat-time (nano-enhancement) and healing time for grafts/implants.

Artificial Muscle Bonding, TL 10-13 (20/30/45 days)

The same process used to help prevent Overstress injuries, but applied throughout the body by a combination of grafting and nano-enhancement. Those who have Artificial Muscle Bonding have the full effects of reinforcement on any cyberlimbs at the time of implantation and reduce the costs of reinforcement by 75% on any cyberlimbs implanted thereafter. Artificial Muscle Bonding is found in three different levels (see below).

Unfortunately, this technique also has a tendency to add “bulk,” inhibiting Dexterity (-1 for levels I and II, -2 for Level III). Each level also adds 15 kg to the chromer’s bodyweight (15 kg at level I, 30 kg at Level II, 45 kg at level III). Higher levels also require much greater protein intake (increased food intake requirements).

Level	TL	Str	Dex	Costs	Side Effects
I	10	+2	-1	250,000 Cr	Quarterly checkups (one/3 months)
II	12	+3	-1	600,000 Cr	Regular Checkups (one/2 months), Increased food Intake (+50%)
III	13	+5	-2	900,000 Cr	Monthly Checkups (one/month), Increased food Intake (+100%)

Str: The increase to Strength (not the DM but the raw statistic itself).

Dex: The Dexterity penalty (to the score, not DM) caused by added bulk.

This cannot be “bought off” as with cyberlimbs.

Costs: Note that much of this cost (up to 70%) is the long and delicate surgery. This is also not something advisable for “self-surgery” fans to try, as entire teams of surgeons and assistants are needed.

Side Effects: “Checkups” gives the frequency of cybernetic checkups (see pg 45), if the chromer skips the checkup, the -1 DM penalty incurred is to all physical actions (due to the muscle tremors).

Autonomic Switch, TL 12 (10 days)

The body's autonomic system controls heart & respiratory rates, digestion, salivation, perspiration, pupil dilation, as well as sexual arousal and many other responses. This "switch" is a dense knot of artificial tissue that is grafted to the base of the brain and allows the selective "switching off" of certain autonomic functions or the "switching on" of others. Due to the inherent dangers of this accessory, the switch is illegal in most areas (although in the patchwork of local-controlled governments found in the Orion Confederation, this means little). A cybernetic sub-processor (that can interface with an IT or HUD) provides specific control rather than the use of pure nerve-control (as one would find with controlling the arms or legs). The effects of this accessory can be very helpful when controlling certain medical issues (apneas and epilepsy), it can also help pass VKAy (Vocal-Kinesthetic Analysis) and similar types of lie detector test. Finally, it can be used to commit suicide, by simply stopping the heart. For these reasons, the autonomic switch is fairly common in the espionage arena.

Cost: 225,000 Cr. (over half of this is the brain surgery involved)

Chipped Reflexes, TL 10 (90 days)

This system allows the user to utilize Expert-programs *not* based on Int- and Edu- skills (any other attribute is fine, see the IT for the Int- and Edu- based experts). Chipped reflexes access reflex memory to help guide the chromer along the "proper" lines (thus there is a -2 to Reaction when using them for combat skills). The user must learn to "go with" the subtle prompts of the skill-programs (this requires 2d6 hours to "chip in" the skills the first time a particular skill chip is used). These prompts help the chromer achieve the proper form (for something like martial arts), or even make appropriate responses (for social-interactive programs).

This accessory merely makes the chromer *able* to access these expert programs, the programs themselves must be run in a separate computer. Increase the penalty to Reaction to -4 if this computer is a non-implant. A "skill slot" can be implanted at the base of the spine which is essentially a dedicated computer used solely for the chipped reflexes implant (a slot can run a single program, up to Expert/3).

In terms of game mechanics, an Expert Program (any level) accessed by chipped reflexes provides the chromer who has no skills with a rating equal to one less than the Program level (i.e. a Level-1 Program provides *Skill 0*). *If the character already has the skill*, they can use an Expert/2 or higher program to eliminate 1 DM's worth of penalties (this is known as "diagnostic mode"). Chipped reflexes are an integral part of the ISP (see sidebar "Integrated Skill Package" page 72).

Cost: 70,000 Cr, plus 30,000 Cr for the skill slot

Techbook: Chrome

Cognition Enhancement, TL 13-15 (d6 weeks+30 days)

The grafting of new brain tissue, grown from a sample taken from the chromer, to the frontal lobe of the brain to enhance intellect. The surgical process often includes alterations to the skull, DNA-matched bone material and scalp is grown at the same time, giving those with this surgery a higher (or in the case of class II, substantially higher) forehead. Once the new material is grafted, the chromer is submerged into a nanite-tank so that the material can be integrated into the cognitive scheme of the chromer (the additional 30 days listed for the time above, the d6 weeks is the growth time for the extra tissue *before* the surgery). Note: this is a TL 13/15 operation (TL 13 for Level I, TL 15 for level II) that can only be performed in Hightech facilities. Note: certain kinds of SIM (Smart SIMs) *already have* this advantage based on their genetics (no double-dipping for bonuses).

Level	TL	Int	Costs	Check	Side Effects
I	13	+2	450,000 Cr	+0	Behavioral shifts
II	15	+3	900,000 Cr	+2	Mild Schizophrenia

Check: Modifier to a *Notice (Average)*, *Investigation (Routine)*, or *Recon (Difficult)* Check to notice that the skull has been modified.

The tests are all based on Intelligence and take d6 seconds.

Behavioral Shifts: Changes to the frontal lobe cause behavioral shifts to occur. This is a roleplaying situation, and if the Cognitive Enhancement was made before play (i.e. during character creation), the change is transparent in any case. This might however feature in the character's background details.

Mild Schizophrenia: The chromer has bouts of mild schizophrenia, including depression, mood swings and hallucinatory events. This can be controlled by regular doses of antipsychotics.

Enhanced Dentitia, TL 8 (5 days)

This accessory turns the mouth into a weapon. Mostly, this involves either adding fangs, oversized teeth or simply buttressing all of the existing teeth to increase hardness and sharpness. It also involves adding myomers to the neck, face and jaw to help provide additional "bite" strength. Oversized versions cause significant changes to the appearance, as do fangs to a lesser extent (when extended, they give a "fat" philtrum). Most bites can only be done from 'surprise' or after a grapple. The bite does d6+5 damage (standard version), d6+8 Damage (oversized version), or d6+3 damage ignoring up to 4 points of armor (fanged version).

Cost: 50,000 Cr (standard version, subtle), 60,000 Cr (Oversized or non-retractable fangs), 85,000 Cr. (retractable fangs)

The Barbarian's Kiss

Enhanced Dentitia is quite atavistic. If the chromer is grappling someone without rigid armor (or armor that specifically protects the throat), they can do enormous damage by ripping out their opponent's throat. Mental Note: Ewwwww.

Following a successful grapple (TMB, pg 64), *as long as they had an Effect of 3 or more* the chromer can make a throat rip attack, for 12+Effect damage (15 with the oversized version). Most NPCs will be dead/dying, although important NPCs and PCs should handle damage as normal. Optionally, the Referee can rule that the bite wound does continuing blood loss (d6/round) until it can be staunched (with *First Aid*).



Gills, Bionic, TL 10 (20 days)

Slits along the sides and back of the Chromer are lined with special tissues (infused with bio-organic colonies that “skim” oxygen from the water) that allow the chromer to operate underwater for approximately 25-30 minutes (25 minutes +5 minutes per +1 END DM; thus a character with an END 12 (+2 DM) can stay underwater for 35 minutes). After this time, the chromer will incur a -1 DM on all actions, although they can stay underwater for another time interval before they must surface. A subtle enhancement, the slits are only apparent when the chromer uses them, but will sometimes ‘flare’ when the chromer is trying to catch their breath while out of the water (after extremely hard activity, coughing fits etc).

Cost: 60,000 Cr

Gills, Cyber, TL 9 (3 days)

Cybernetic Gills use an exchange siphon in the neck/sides to draw in large amounts of water so that enough O² can be filtered out. This provides the chromer with 4-6 hours of underwater activity before the batteries for the gills run out (these can be replaced with a significant action. The filters also need to be replaced every 100 hours of actual use. This is an obvious enhancement.

Cost: 75,000 Cr (Gill), 125 Cr (spare battery), 2,500 Cr (spare filters)

Techbook: Chrome

Implanted Commlink, TL 9+ (1 day)

The character has a commlink implanted within their body. The Commlink can be used for multiple forms of communication (data, voice even video if the character has a HUD and/or scanner) and linkages are accomplished by mental command. If the character has a HUD, any incoming data or video can be sent to it, if the character has an audiolink (ear modification which can be added to anyone, even natural ears), all sounds are routed there. The range of the unit is determined by one of three “modes” of operation:

- ⚡ **Close**, which is useful in congested areas like orbital facilities and conveys the signal only a dozen meters or so (so that the area does not become blanketed in cross-talk, this also makes it harder to hack/jam, -3 DM on any attempt to do so).
- ⚡ **Point-to-Point**, base range is 25 km (see below to add).
- ⚡ **Network**, which uses local commercial communication grids.

“Network” mode is the most susceptible to jamming and hacking (+2 DM for the hacker/jammer to disrupt the communication). Increasing “Point-to-Point” range can also add to costs and surgical recovery time (due to internal antenna and power units): +250 Cr (50 Km range, +1 day recovery), +750 Cr (100 km range, +1 day recovery), +1500 Cr (250 km range, +2 days recovery), +3000 Cr (500 km range, +2 days recovery), +7,500 Cr (1,000 km model, +3 days recovery), +15,000 Cr (5,000 km model, +4 days recovery). Note that 500 km is sufficient to allow access to low orbiting satellites from a planetary surface.

Cost: 7,500 Cr (basic unit), 27,500 Cr (encrypted unit, comes with an embedded “scrambler” that puts a -4 DM on efforts to hack into or listen in on communications sent to and from the unit and a -2 DM to jamming efforts).

Communication Connections in the Sector

The creation of a local Internet is one of the first things most colonies do, and this often includes setting up satellite relays as quickly as possible for provide for outlying areas as the colonies grow and develop. All of the worlds listed in the *Twilight Sector Setting Book* have functioning satellite based internets, and thus complex communication systems (the “Networks” that the Comlinks can plug into for assisted communications). This will not always be the case on the fringes however. Colonies that only cover a small area (which could be up to several thousand square kilometers) can often be covered by cheaper EM broadcast towers and similar technology (“cable” systems for example). Often their are “repeaters” and “uplinks” in these places, but they will not always be accessible as part of the “Network”. Once able to access the local “Network” the Commlink can pass data as well as voice and images. Keep in mind this is largely unshielded however (see *Mutants & AI*)

Injection Ports, TL 9 (5 days)

These implants are filled with medicinals which can be released into the chromers system by mental command. Either technically cybernetic or biological, the injection ports are made from organic materials to mimic biological matter enough to pass simple electronic/resonance detection (they often look like a cyst if they are detected at all). The Injection port is commonly filled with a combat or medicinal drug of some type, although any drug designed to be injected into the bloodstream could be incorporated (recreational stimulants).

Ports are commonly found in cyberlimbs or bionics, as they can be grown or built right into the chromer's system and therefore have no need for surgical costs. If made as a biological replacement, these ports are generally re-filled by syringe, the injection point often denoted by small circles found on some point of the body to mark the location of the internal reservoir (sometimes these are simple ridges instead). Along the inside of the forearm is the most common placement for these reservoirs, the underside of the upper arm is a close second; for legs the mid-thigh region is most commonplace location. How many doses the chromer can carry depends on where they have been implanted. Arms generally can accept 3-5 dose-reservoirs before they become detectable (depending on the size of the chromer), legs generally can hold as many as 6-12 dose reservoirs. If located in the gut or chest cavity, more than a dozen doses can be accommodated.

Cost: 6,000 Cr for the control & release organs/mechanisms plus 500 Cr per dose for the reservoirs, and 10,000 Cr for implantation. If the character undertakes multiple implantation sites, simply pay the 10,000 Cr for each site.

Variant: Dupe/Carrier Organs

Many drug mules of the 30th century have major organs replaced with normal-appearing large reservoirs, aka Dupe/Carrier Organs. While expensive due to surgical costs alone, such operations have proven to be very lucrative. The best examples of these Dupe/Carrier Organs are detectable only with a Very Difficult *Medical* check, assuming those performing the examination even have the proper equipment. At the low-end, non-functional fake organs are much easier to detect, by making a Routine *Medical* check assuming that the searcher has the proper medical scanning equipment, or a Very Difficult check even without (symptoms).

Cost: A Drug-Mule "liver" or "spleen" costs in the range of 60,000-90,000 Cr if it is to be functional (and thus harder to detect) or just 30,000 Cr for a more simple non-functional version.

Integrated Squawk Box, TL 8 (1 day)

This is a device that broadcasts sound for the chromer. The squawk box can be implanted practically anywhere on the body. Certain sub-processors (see below) can expand the utility of the squawk box, adding hardware components or software functions as needed. Basic vocal quality is good to excellent, and can even incorporate the chromer's legal voice-pattern ID (legally) or up to TLx2 others (illegally).

Although more commonplace for Uplifts, some humans prefer to use squawk boxes as well (especially if they auto-translate their speech for those speaking in different languages, for more on this see **Tinker, Spacer, Psion, Spy** pg. 172). The basic squawk box emits sound from a specific place (the base of the throat is a common location, the button-sized speaker manages normal volumes of voice and is color-coded to the chromer's flesh and sunk slightly beneath the skin).

Cost: 20,000 Cr (base unit) 45,000 Cr (Fine unit, more clarity)

Squawk Box Sub-Processors:

/// **Loudspeaker:** The volume of the squawk box is magnified from a loud voice (80-90 decibels) to a loud concert (115-125 decibels). This requires a larger than normal external speaker, roughly the size of the pad of the thumb of a large man or more. The sound level is dependent on the shape and size of the external speaker. This is often paired with a soundplus sub-processor.

Cost: additional 1250 Cr.

/// **Soundplus:** The soundplus sub-processor increases the range of sounds that the chromer can make. Most squawk boxes cover the normal speech sounds, but the soundplus adds "sound effects" capability, covering a far wider range of noises. The same tiny computer used for the translation sub-processors are slaved to this system, although they are not hardwired to anything but the box itself and come pre-loaded with thousands of separate sounds. Pranksters with these sub-processors can be very annoying. If the chromer has a record function on their cyberears or a recording device hooked up to the squawk box (or IT system connected to the squawk box) then they can replay sounds that the character hears, adding to this database. This is often paired with a loudspeaker sub-processor.

Cost: additional 3,000 Cr (including the sound database)

/// **Subvocalizer (TL 9):** The subvocalizer stills the throat and mouth muscles when activated, but translates muscle commands to the squawk box as normal. Effectively eliminating the "doublespeak" problem. This is often helpful when the chromer is translating

from one language to another. One issue or problem with cheaper models is that facial expressions – like smiling and frowning – are often “shut down” as well (higher end models have filters that can discern and allow a smile or other expression while they still prevent vocal movements for associated speech).

Cost: additional 5,000 Cr (cheap) to 15,000 (expensive, TL 10 and above versions).

- /// **Translation, Simple (TL 10):** For those lacking an IT, the squawk box can easily be interfaced with a small dedicated computer that runs translation software. This small computer/0 is specialized for translation programs, and weighs less than a sixteenth of a kilogram (about 2 oz). The system is capable of holding more than one translation program, but can only run one actively at a time. If the character has a HUD or audiolink, the translator will provide a scrolling translation of any and all incoming voices. If not, a connection can be made to a communications link that runs to an earmic. A subvocalizer is usually combined with the system to allow the user to speak back only through the squawk box (thus preventing “doublespeech.” Note that users with an IT generally have a translator program running on the IT which allows them to vocalize thoughts. This too can be tricky, as sometimes they “let thoughts slip”, so translation programs can be useful for these individuals as well. It also allows dedicated linguistic translation programs to be run without using IT memory.

Cost: additional 8,000 Cr, the least of which is for the computer itself, which has a relatively nominal cost.

- /// **Translation, Advanced (TL 12):** The advanced translator uses a slightly more sophisticated computer, embedded at the top of the shoulder, which is more powerful than that used for the simple translator. This model also utilizes a muscle-control system that is wired into the muscles of the throat and mouth similar to, but far more advanced than, the subvocalizer. The chromer who allows the squawk box to control these movements (by mental command) will mouthe the words they are speaking in synch with the sound (that still comes out of the squawk box, but if placed low on the throat it can be easily mistaken for a natural voice). *Note:* this system incorporates the utility of a subvocalizer subsystem as well, one does not have to be purchased separately).

Cost: additional 55,000 Cr

Doublespeech:

Verbalizing in a known language while the squawk box broadcasts in the translated language; many listeners find this confusing (even when the ‘speech’ portion is merely a whisper).

Techbook: Chrome

Integrated Tutelary, TL 10+ (4 days)

A “tutelary” is a helpful voice or mentor, like a guardian angel. The IT or Integrated Tutelary is a computer system which has been implanted inside of the body, usually in the shoulder or chest (this affords much more space than the skull and is still close to the spine). The IT is designed to connect various systems together and provide the chromer with computing capability (often, but not necessarily as a part of an Integrated skill Package). The IT *must* be installed with a HUD or Audiolink for information output (HUD preferred, both are strongly recommended). IT’s are specialized to run a *Mentor Program* (an advanced version of the Intelligent Interface program). The IT’s Computer rating is used to determine how many programs can be run by the system (other than the Mentor Program). A *Security Program* may be added to prevent hacks.

In terms of game mechanics, an Int- or Edu-based *Expert Program* (any level) provides the chromer who has no skills with a rating equal to one less than the Program level (i.e. a Level-1 Program provides *Skill 0*). *If the character already has the skill*, they can use an Expert/2 or higher program to eliminate 1 DM’s worth of penalties (this is known as “diagnostic mode”). **Note:** Because IT’s are installed in the “center of mass” (a common aiming point for incoming attacks) they can be damaged in combat situations (see *Wound Failure Point*). **Note:** Using Expert Programs makes actions take slightly longer (up to +25% base time). If an chipped skill has to be used during a combat round, the character’s reaction is at -2.

Integrated Tutelary Processor & Cost Chart

TL	Cost	Processor	Wound Failure Point	Check
10	21,250	Computer/1	Every Wound Level	9+
11	21,250	Computer/1	Serious Wounds	6+
11	21,750	Computer/2	Wounds over End	9+
12	21,500	Computer/1	Serious Wound	3+
12	21,750	Computer/2	Serious Wound	5+
12	23,600	Computer/3	Wounds over End	7+
13	22,000	Computer/2	None	Nil
13	27,350	Computer/3	Serious Wounds	6+
13	30,000	Computer/4	Wounds over End	8+
14	33,600	Computer/3	None	Nil
14	39,850	Computer/4	Wounds over End	5+
14	146,500	Computer/5	Every Wound Level	8+

Cost: The cost in Cr of the computer (for this tech level) *plus* a Mentor Program (TL 10 systems run a simplified version of this program). This cost includes surgical implantation (which accounts for most of the

Your new Roommate: Mentor Programs

The IT runs a Mentor program, which can either provide the character with the closest friend they'll ever have or the most annoying lodger imagined. Sometimes both. The best Mentors are useful and helpful. The Mentor is after all designed to interface with the user based on sophisticated programs designed to minimize conflict and maximize efficiency. In some cases however, these goals are mutually exclusive. Certain personality types for example thrive on conflict, and often require Mentor programs that "challenge" them ('nag' would be another word).

Sometimes the Mentor will even communicate with the chromer's friends, sending them e-messages for example, to solicit help or facilitate understanding. This can be invasive ("Hey Mike, this is Guinevere, John's IT, I was wondering if you could give him a call. He's feeling kind of blue today.") but it is hard to prevent as chromers often use the IT's Mentor as a butler/secretary (making calls, appointments etc.).

Keep in mind however that while sometimes frustrating/annoying, the Mentor should never be completely over-the-top creepy or a true problem (although a virus that slowly turns the Mentor against the player could be truly insidious).

actual costs). Note that TL 13 and 14 units are only available on Hightech worlds.

Wound Failure Point: After certain levels of damage to the chromer, the IT could be forced to shut down, this is known as the Wound Failure Point, and the check required is the Wound Failure Check.

"Every wound level" means that the check must be made every time a stat takes damage i.e. when Endurance takes damage (initially), again when/if Strength takes damage, and again when/if Dexterity takes damage.

"Wounds over the End" indicates that the check only has to be made after the End threshold is crossed (and damage begins to be taken by one of the other two stats).

"Serious wound" means that the check must be made only after the character has taken damage to all three stats.

"None" indicates that the computer is small enough that it will not be significantly damaged until after the chromer is otherwise dead anyway.

Check: The number required in a standard 2d6 roll to avoid IT shutdown at the Wound Failure Point(s); add the chromer's End DM to the roll.

Example: A character with a TL 12 Computer/3 IT ("Wounds over End") and End 7 is hit in combat for 5 points of damage. This does not trigger the check as it is the End stat is not reduced to zero. The character takes 4 more points, giving them a total of 11 points of damage (the excess damage spilling over to another stat). Because the character has taken more than End in damage, they must now make the Wound Failure Check (as a TL 12 Computer/3 the check is a 7+). Because the character has no End DM, this check is unmodified.

The Integrated Skill Package Crossover

One of the most useful combinations of accessories is an Integrated Tutelary, Chipped Reflexes, Neural Plugs with a HUD and audiolink (implanted or via HUDtacts and a Mastoid Audiolink). This combination is actually a *de facto* Package (not so-listed because of the One-Package Rule, which this system ignores) referred to as an **Integrated Skill Package (ISP)**.

When the IT or Chipped Reflexes “skill slots” are loaded with the appropriate program (Expert/1), the character’s skill is considered 1 point higher (thus, if they have no skill, they “gain” a 0-level skill, if they have the skill at level-1 it is counted as level-2 and so forth). If loaded with progressively more sophisticated programs (Expert/2 and Expert/3), the Character can also reduce negative DMs (reduce 1-point’s worth with an Expert/2 and 2-point’s worth with an Expert/3 program) in *addition to* raising the base skill. Note that these benefits supersede the “used alone” benefits mentioned under the IT and chipped reflexes listings.

Example: Morg has **Chipped Reflexes** and no **Piloting Skill**. He slots in an **Expert/2 Program** and receives an equivalent Skill of 1. After he gains the **Piloting-1 skill** through experience, the same program allows him to remove 1 DM worth of penalties (since it is level-2). Morg’s friend Jaarl has an **ISP** and also has **Piloting-1 skill** and a **Piloting Expert/2 program**: the **Expert/2 program** allows him to **Pilot** as if he had **Piloting-2** (adding a level to the skill) **and** allows him to reduce the 1 DM of penalties for tricky maneuvers (if he has any DMs).

The following chart distinguishes ISPs from ITs/Chipped Reflexes...

IT/Chipped/ISP Skill Adjustment Chart

Condition:	Benefit:
Chipped Reflexes or IT (Only)	
No/Low skill:	Use Expert Program Level-1 in skill instead
Chromer skill equal to or higher than Expert-1):	Use Chromer skill but remove 1 negative DM (<i>This is only with an Expert/2 Program or higher</i>)
IT AND Chipped Reflexes (ISP)	
No chromer skill / Low Skill (< Expert-1)	Use Expert Program Level-1 in skill instead
Expert/1 loaded	Add 1 level to Skill (Skill-1 becomes Skill-2)
Expert/2 loaded	Add 1 to Skill, <i>plus</i> reduce 1 DM of check penalties
Expert/3 loaded	Add 1 to Skill, <i>plus</i> reduce 2 DM of check penalties



Using Passive Information Feeds

Passive information can come in from a wide variety of sources, including sensors, secondary sensory organs, even video or audio feeds. They are commonly used with IT/ISPs to access special information. This is how the ISP can be used with an Expert *Medic* Program to monitor a patient's vitals while using active control on critical life-saving machinery at the same time. Or how a Homicide detective's *Investigate* Expert Program can access fingerprint and other biometric data on-file about a suspect while looking over a crime scene with a forensic scanner searching for viable samples.

Data Collectors (see Appliances, page 93) can be useful to allow more than one device to stream data into the same passive "port", but only allow passive feeds. Collectors can even be implanted (5,000 Cr or more depending on the size of the Collector desired for an implant) to the Neural Plug system to allow for this utility without having to cart the additional hardware around (best for 5-10 passive wireless connections, but a multiplug "Collection plate" can be installed for +15,000 Cr).

NID-bridges (see Appliances, Page 96) allow for the connection of a system which is normally not set up for a wireless, induction or wired connection. Most users scrap the included Security program and replace it with their own (it can be loaded with up to Security/3). NID-Bridges are good for passive or active control of their units, although not all units which are connected through an NID *can* be controlled remotely (retrotech and systems with primitive/non-computerized controls, the NID-Bridge doesn't add any control components).

Note: it requires more than an NID-Bridge slapped on a gun to create a "Smart" weapon (there are several pieces of hardware involved working together).

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There are a number of neat “tricks” the IT/ISP can pull off when loaded with an Expert Program, these are simply samples (Referees should add more):

Tactical: A *Tactics* Expert program can be very useful in coordinating military efforts, especially when combined with accessible (i.e. data) maps of the area downloaded to the IT, and sensors scattered around the battlefield connected via the neural plug. The positions of combatants can be shown in real time, communications can be coordinated (either with an Integral Commlink or a Communications device routed through the Neural Link). If artillery or other remote fire were brought in via neural link, those could be integrated with the combat operations for safe close coverfire. Databases with weapons information, military tables of organization and the like allow for a more granular level of information at the chromers mental fingertips.

Threat Assessment: A *Recon* Expert Program could access any cybersenses possessed or sensors connected via neural link. Choke points and fields of fire could be relayed instantly and shown on-screen. Active threats would be tagged and any visible weapons could be passed through a database (a separate program, a Database/0 providing popular models and a Database/1 providing relatively complete inventories of all local manufacturers). Many of those with secondary senses and this setup use the IT for “overwatch”, keeping an ‘eye’ on these senses and triggering an alarm if something threatening pops up (which saves on wear and tear).

Technical: A sophisticated 3D modeling application (integrated into a *Mechanic* or *Engineering* Expert Program) allows for the part or system being worked on to be reproduced for testing and analysis. If plans for that component are not available, the IT will help build them (also useful for unknown hardware, although this could trigger a hacking effort or trigger device for something unpleasant since it involves sending signals into the system in order to trace out the wiring). Even purely mechanical devices can be modeled given a little more time and effort. Mathematic sub-routines help to crunch the numbers and re-check figures (shaving off up to 20% of the time to conduct a build/repair). Basic repair steps or chemical composition tables can be accessed from common technical databases (some included with the Expert).

Medical Aide: The utility of this package depends on how much information the ISP is provided about the patient. With the right sensor connections or cybersenses (Scanning, Noise Amplification, Wavelengths etc.), the Medical Aide can generate a wide variety of statistics and analytical datapoints that are useful for patient diagnosis and care, databases (often packages with these programs) will help integrate this data to provide both suggestions and therapy options. If used with full diagnostic sensors and scanning equipment (integrated into most 30th century medical beds) live 3D models of the patient’s internal organs can be created. This can vastly decrease the amount of time required for care (up to half in some circumstances). Personal database subroutines can keep detailed records of prior patients for comparison and review.

Behavioral Assessment: A *Notice, Empathy, Confidence, or Social Science (Psychology)* Expert program could be very useful in determining the behavioral patterns of the specific target of the chromer's attention. If sensors or cybersenses (particularly a digital Scanner) are available to the IT, profiles of the individual are logged as a private database, and behavior models can be established to determine, analyze and/or predict the subject's actions. This could provide a +2 DM or +4 DM (depending on the sensors accessible) in determining whether the individual is lying, or determining when they are otherwise stressed (which would be in addition to whatever benefits are gained from using the Integrated Skills Package).

Social Interaction: A *Diplomat, Streetwise* and *Persuade* Expert System combs local sources for relevant background data on local persons "of interest" (either flagged by the chromer or provided via a database sold/acquirable locally), compiling a personal "who's who" database for the use of the chromer. The system tracks and maintains useful facts about them (age, marital status etc) as well as 'interaction webs' that help the user to determine who knows who and what the state of their cross-interactions might involve. When creating a "plan of attack" to try and convince someone of something, this can provide a +1 to +2 DM to relevant checks depending on the quality and amount of information available to the chromer. This also presumes the character stays "on plan" (Referees might state that an NPC is vain and that defines their "plan of attack", so anything the PC does appealing to the NPC's vanity might get the bonus, but an effort to influence the NPC which does not rely on their vanity receives no bonus). While this is largely database-reliant, there are also stock pieces of advice that come up as prompts (some users turn these off as they can be annoying). Unlike Behavioral Assessment programs, these Expert Systems also provide the user with data on *their own* appearance and dress, body language and facial expressions, so that they always present themselves in the manner that they wish (-2 DM for anyone trying to read the emotional state of the chromer using *Investigate/Notice/Empathy*).

Vehicular: The vehicle's status is constantly updated for the user, all relevant gauges (and some non-standard gauges if these are hardwired into the system) are connected to the user via the HUD for instantaneous feedback. This allows for far greater control of the vehicle and enhanced performance. The Chromer is able to pull off enormously difficult stunts and tricks (double any reduction for negative DMs when using the Stunt action). Vehicle diagnosis and repair is also assisted by a +2 DM for all *Repair* or *Engineering* checks.

Tradepal: The use of basic Behavioral Assessment and a range of other applications are available with a *Broker* Expert Program. Personal interactions are accessible through the database, but also local pricing (if available on local internet) and market forecasts. Passive feeds from multiple markets can be managed and presented in user-specific ways, as detailed as desired. When used with a database and connected to a cybersense or sensor, the Tradepal can help to evaluate commodity value (and +1DM to forecast prices).

The T-Coil: a TL 14 “Synergy” Biocomputer

The incorrectly-named “T-Coil” is a development which came out of the Deramus Enclave just over two decades ago, but has yet to see widespread application throughout the Known Galaxy. The T-Coil gets its name from the erroneous assumption that this system operates as a scaled down quantum computer (see the upcoming *Mutants & AI*). It is not, although recent developments of the researchers who initially came up with the system in the Deramus Enclave may lead to quantum versions in the *next* two decades.

The Synergy Biocomputer takes advantage of certain biological cell properties in a living host to “boost” processing speed to many times that available from existing systems; co-opting living cells to enhance processing power. The amount of “boost” is directly connected to the amount of cells that the system can access, although there appears to be (at the moment) a maximum limit (about the size of a cow). When attached to a human being, the computing power is roughly one-and-a-half (rounding up), so a TL 14 Synergy Biocomputer/8 (base Computer/5+3). Because these are Biocomputers, the system is also well-integrated into the body (no failure after taking wounds). The potential for improving ship’s computers alone could be staggering.

Currently, the T-Coil is in “regular” use for Cyrgeware systems (see page 122), although these are hardly plentiful in the market yet themselves. A few firms in the Deramus Enclave and the Oster Republic *are* producing biocomputers of this type for general use, and several in the Terran Union are filling “modified” (stolen) prototypes of their own. The Synergy Biocomputer/8 mentioned above costs 500,000 Cr (implanted).

Holographic Imagers, TL 8+ (2 days)

A holographic imager can be implanted somewhere on the body (hands or other exposed areas are most common), allowing for the display of images (everything from flat data screens to display text to moving 3D images). Images can be fed to the implant from internal or external sources. The Tech Level determines the level of detail and coverage of the images. A projector system can also act as a Holonet (see Page 94-95) (commonly the face-version only, due to clothing).

Cost: 5,000 Cr (single); implanted Holonets are x10 those costs.

Lightskin, TL 9 (20 days)

The chromers skin is shot through (by nano-enhancement) with light-emitting fibers, allowing the user to literally “light up” portions of their own hide. Some sections of skin have more of these fibers than others, allowing for areas where screens can be displayed against the skin. This is largely for aesthetic rather than practical purposes, and is quite common amongst singers and other live-performers. This accessory is maximized with an IT or Neural Plug interconnection that allows the skin to be used as a screen.

Cost (based on coverage): 20,000 Cr (total area of 14 cm x 21 cm); 40,000 Cr (25 cm x 25 cm); 100,000 Cr (¼ of the body); 150,000 Cr (½ of the body); 200,000 Cr (¾ of Full body)

Medicine Glands, TL 12 (1 day)

This implant uses special glands that create and store analogues of drugs/medicinals (up to 1,000 Cr in cost per dose). Poisons may not be produced, as this would effectively poison the chromer.

These glands produce chemicals at a rate which depends largely on their complexity (which in turn is represented by the base cost of the medicinal per dose).

Reservoirs clustered with the gland can hold excess doses. These reservoirs are generally found in the form of 2-dose “pouches”

which can be linked together. Note that the glands tend to have a tendency to wear out over time. They are generally only “good” for about 24 months when “active”. The glands can be forced into an “inactive” mode by certain drugs, which slow them (half production for a month, then nothing) and can be “reversed” with a similar drug (two weeks after taking these drugs, they begin to produce the medicinal at half normal rates, then after a month at this reduced rate are back to “normal”). This can be done to extend their useful lifetime considerably during extended downtime.

Cost: There are three cost components: the glands, the surgery, and the reservoirs. All are factored separately. The glands to create the medicinal cost 1000 times the cost of the drug (a gland that produces a 50 Cr Stim drug would cost 50,000 Cr, a gland to produce a 500 Cr Combat drug would cost 500,000 Cr. Implantation of the glands requires an additional 10,000 Cr (which includes implantation of the reservoir). Finally, there is also a cost of 5000 Cr/2-dose reservoir.

Medicinal Gland Chart

Base Cost (Dose):	Interval
0-50 Cr	once/day
51-100 Cr	once/2 days
101-500 Cr	once/4 days
501-1,000 Cr	once/week
1,001+	unavailable

Memory Filaments, TL 13-15 (60 days)

This accessory, a combination of nanites and grafts, redesigns the way that the chromers memories are processed. Hypnotrigger also speed up and enhance the mechanisms of recall. In game terms, the process adds to the Education score and maximizes the speed with which information can be recalled to mind. When greater memory connections are made, the chromer sometimes suffers from vivid dreams (replaying scattered memories in their sleep, often obsessively playing one or more set of memories over which prevents entering deeper levels of slumber), and occasional fugue states (bouts of waking vivid memory replay caused by entering, or just having undergone, extremely stressful situations).

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Level	TL	Edu	Costs	Recall	Side Effects
I	13	+2	350,000 Cr	½	Vivid Dreams
II	15	+3	800,000 Cr	¼	Fugue states

Edu: The adjustment to the Edu (score, not DM)

Recall: The amount of time required to recall pieces of information compared to (arbitrary) normal data recall. This is only for recall, not for implementation (so that most tasks, entailing *more* than just memory recall, are slightly affected or unaffected).

Side Effects: "Vivid Dreams" can cause players problems getting natural sleep. There is no static game mechanic for this, but players can incorporate this into their background. "Fugue States" During or after instances of stress (Referee choice, but this should not be checked in more than one instance/session), the chromer has bouts of (random) vivid memory replay which interfere with their normal activities. Make an Edu-based characteristic check. If this *fails*, the chromer is unaffected, if it is *successful*, they enter the fugue state for a number of combat rounds based on the Effect number (0 indicating that they can only make a single simple or free action on the round this occurs on).

Just a Sip from the River Lethe

In the **Twilight Sector Setting**, both Psionic abilities and high tech devices allow for brain scanning. While some protections do exist (**Anti-Psi** Skill, Psionic Protection gear) this prospect is still a major concern for various militaries, governments, and corporations. The following implant, in use for more than 200 years by the end of the 30th century, replaces other less sophisticated methods (such as chemical memory wipes) to narrow this security gap...

Memory Shunt, TL 11 (15 days)

The memory shunt is a bionic implant that re-routes memories of the subject before they are committed to their long term memory. The implant can store up to 6 hours of such memories, which is more than sufficient for normal use since it is generally used for codes, names, numbers and other scraps of sensitive data rather than entire conversations. Chromers have full access to this information, but it is impervious to Psionic deep scans and **resistant** to technological engram scanners without the proper codes (which can be used – with the codes – to back memories up as well).

The secondary function of the technology is to wipe all stored memories in case of capture or death. Once erased they cannot be retrieved. Erasure is controlled either by the chromer or an automated circuit which detects a loss of life functions (this is subject to a d6 minute delay however). The erasure is also sometimes caused by EMP bursts (1-4 of a d6) and Psionic attacks (1-3 of a d6).

Cost: In several Careers (see **Tinker, Spacer, Psion, Spy**) this implant is provided for free at certain ranks. If purchased (rather than provided), it costs 125,000 Cr.

This implant originally appeared in the book Tinker, Spacer, Psion, Spy.

Neural-Plugs, TL 9 (3 days)

This is a common form of *Neural Interface Devices* (or NIDs), which are used to provide a digital-to-neurological connection, giving the user control over electronic devices that are connected and capable of receiving such input. Neural plugs can be mounted at nearly any part of the body, but neck and wrist/forearm are common. There are three levels of plug:

- ⌘ *Single-Plugs* indicate a single access point, which allows for full sensory immersion in cyberspace, or control over most common devices (including computers). This is all that most people require. Placement varies, commonly either the forearms, the neck, the temple or somewhere along the spine.
- ⌘ *Triple-Point Plugs* incorporate three different plugs (usually both forearms and neck). Triple-Point Plugs are generally used for vehicles and other extremely complex hardware, which require all three of the plugs for use. While any one of these plugs can be used for a control connection, no more than one system can be actively *controlled* at a time (i.e. information can be streamed *in* from the other unused plugs passively, or connected systems can be controlled in series but not at the same time).
- ⌘ *Five-Point Plugs* are used for highly complex systems, like LANCE armor, or running entire facilities and Spacecraft. Commonly 5-point plugs are arranged as two pair of plugs on either side of the spine (upper inner shoulder blade area and lower back) and one more on the dominant forearm). As with Triple-Point Plugs, any/all of these plugs may be used for passive connections, but the chromer can still only *control* one system at a time.

While the term “plug” would tend to suggest that equipment may only be hardwired (connected physically by plugs) this is merely the most secure option, there are wireless options (tight I/O broadcast) and induction points (a plate that allows data to be transferred rather than a “plug” connector) that can be used instead of/in addition to, the actual plugs. The number of plugs listed above is simply the number of different systems that *can* link to the cybernetic implant (and thus the chromer) at the same time using whatever method. A 5-plug system might for example be used for three wireless connections, one contact connection and one wired connection at the same time. *Changing the control of an input from one linked system to another can be done with a minor action.* Adding a sixth connection of any type even though additional plugs are physically “open”, is impossible although it can be on “standby” (no passive feed or active control, but it can be swapped

Note: For a non-cybernetic NID option, see *Trodes, Page 99*

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out. Swapping a system from standby for one already in connection can be done with a significant action.

Cost: 30,000 Cr (Single Plug), 60,000 Cr (Triple-Point Plugs), 95,000 Cr (Five-Point Plugs). Induction plates are added for an additional 1000 Cr each (most of which is for the wiring and subcutaneous surgery; commonly the dominant hand is used for an induction plate).

Neuro-Latticing, TL 11-15 (45/60/90 days)

By stimulating the growth of selected nerve bundles in a complex "lattice" framework and placing "boosters" to speed the signals, physical dexterity can be substantially enhanced. Unfortunately, this also tends to cause micro-seizures that weaken the immune system (and thus a lower Endurance).

Level	TL	DEX (Max)	END	Costs	Side Effects
I	11	+2 (15)	-1	350,000 Cr	Yearly checkups
II	13	+3 (16)	-1	800,000 Cr	Quarterly Checkups (1/3 months), Twitchy
III	15	+5 (18)	-2	1,200,000 Cr	Monthly Checkups, Twitchy, Anticipation-reflexes

Dex (Max): The adjustment to the Dexterity Characteristic (the score, not the DM), note the maximums associated with each level.

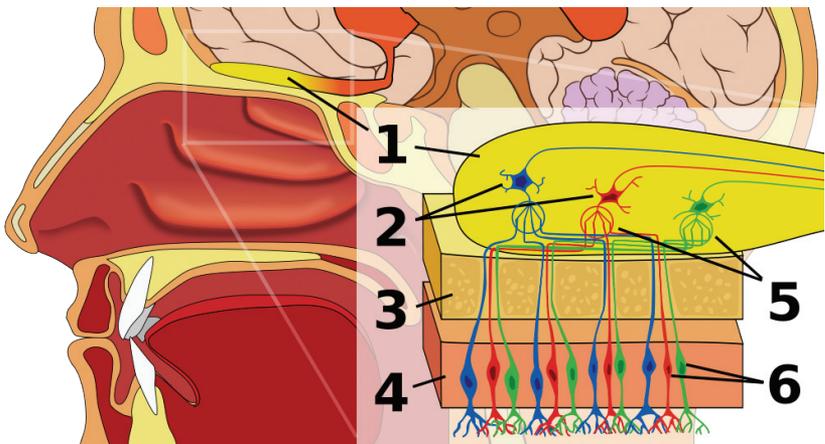
END: The (negative) adjustment to the Endurance Characteristic (the score, not the DM).

Side Effects: Checkups must be maintained according to the above schedule or the character receives a -1 DM on all actions. The effects of Level II and Level III Neuro-Latticing are very noticeable; jacking the nervous systems to these levels makes the individual appear very "twitchy" to observers. This also gives them sleep problems that often require pharmacology or hypnotherapy (these are roleplaying disadvantages, no real mechanic unless the Referee decides it could affect in a specific situation). Level III Neuro-Latticing also tends to cause the chromer to have "anticipation-reflex" issues. In stressful situations, these individuals sometimes 'jump the gun' and react too quickly (either before they were supposed to act or acting in a tense situation where this is unhelpful, such as a stand-off). The conditions for this are determined by the Referee's discretion, and the player can try to avoid this situation by succeeding a Difficult (-2 DM) Intelligence test. If this is failed, the chromer 'jumps the gun', going with their action on a +4 to their Initiative and -2 DM on their action (you shoot *fast*, not *well* there Cochise).

Olfactory Boost, TL 11 (d3 weeks+7 days)

Nanites enhance the existing olfactory bulb, causing it to grow in size and increasing the density of the glomeruli in the organ as well (enhancing the sensitivity and the range of reception alike). Normal human receptors number around 5 Million (as compared to 100 Million for a bloodhound), the Olfactory Boost gives the chromer something in the order of 35-65 Million which are added to the bony plate (or *turbinates*) inside the nose using a combination of "soft" grafts and nanites. The overall effect boosts the ability to smell by a factor of 200 (a +4 DM to simple smell related sensory tests like distinguishing an odor). This does not give humans the smell sensitivity of a dog (thousands of times better than humans), but it does give non-Uplifts a great deal of useful information. Chromers can discriminate between two individuals by their sense of smell for example, and can even find two genetically related individuals by their similarity of scent. Chromers can also track much better than unmodified humans (+2 DM to *Survival* and *Recon* tests involved in tracking). They have a better grasp of human reactions because they can *smell* emotions to some extent (+2 DM to *Empathy* tests when they are within "smelling range" which is about 5-10m). The chromer also interprets smells differently, with some strong smells they hated before becoming pleasant and vice-versa. Occasionally, the Referee can give the chromer a -2 DM (or very rarely a -4 DM) condition-modifier for being in the presence of a particular odor (which does not have to be strong, just irritating to their newly-refined sense of smell). Those who have Olfactory Boosts also suffer from *double* the normal effect of pheromones.

Cost: 125,000 Cr (subtle version, no physical changes)



The unenhanced human olfactory system. 1: Olfactory bulb 2: Mitral cells 3: Bone (turbinates) 4: Nasal epithelium 5: Glomeruli 6: Olfactory receptor cells.

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Repair-Skin, TL 12 (16 days)

This mixture of grafts and nano-enhancements allow vastly reduced healing times for the skin, thanks to nano-implantation of a series of glands that produce super-charged Langerhans cells, macrophages, and fibroblasts. As a result of releasing these specialized cells, the skin is able to repair tears and lesions very quickly. Often small cuts and nicks are gone overnight. This increases healing results for the *first day* (only) of a particular wound to End DM+6+Medic skill of any medical personnel providing care. *Note: Repairskin is generally incompatible with any other type of skin accessory.*

Cost: 60,000 Cr

Shiftskin, TL 13 (12 days)

The chromers skin shifts pigmentation radically, allowing for the skin to shift into camouflage, darkening in low light, whitening against snow etc. The changes are very fast, allowing the user to shift patterns in a few seconds (although this is far too slow for 'invisibility'). Using interface plugs, the user can wear clothing with similar pigmentation-changing weaves and match covered to uncovered skin. This is a passive neural connection in this case: the user isn't controlling the color shifts in the clothing, but feeding data that the processor which is built into the clothing then uses to make the match. This provides a +2 DM to *Stealth* efforts to blend in with the surroundings. *Note: Shiftskin is generally incompatible with any other type of skin accessory.*

Cost: 90,000 Cr. Pigment altering clothing and the processor which allows this clothing to match the chromer's pattern costs 5,000 Cr (1,500 Cr for the fibers in the clothing, 3,500 Cr. for the dedicated processor).

Skeletal Replacement, TL 14 (90 days)

This does not actually involve *replacement* of the skeleton but some of the skeleton's cells. Still, the name has stuck. Rather than actual replacement, the bones are subjected to nano-enhancement which radically alters their basic structure. This gives the skeleton the strength of metal while still retaining the ability to flex slightly. The long-term effects of this accessory are serious. Various treatments and supplements must be taken regularly to perform the same functions that the bones once did (restoring red blood cells and the like), and implants are placed in the system itself to assist this process (part of the costs). This however requires "upkeep" treatments every three months to maintain these critical biological functions. If they are not maintained, the character loses d3-1 END every week the

treatments are withheld. The character is also noticeably heavier than they were before the process, along the lines of 35-50 kg. **Game Effect:** Chromer gains 2 points of damage reduction for each wound taken (note that this is *not* armor, therefore armor penetration does not affect it). *Note:* this does not stack with the same effect gained by other means (such as certain combat drugs), use the better of the two. Also, with damage that the Referee considers would have resulted in a broken bone, the character will likely be protected (although some wounds can still do this, industrial cutters et al). In situations where some of the damage might have come from broken bones, Referees might reduce the trauma of that injury *further* than 2 points (Referee's discretion). *Note: This Accessory cannot be combined with any other Skeletal adjustments.*

Cost: 1,500,000 Cr The quarterly treatments cost 5,000 Cr each and must be done in a TL 10 or higher facility (although TL 7+ medicines can prevent End loss, the treatments need to be more frequent and cannot stop the losses, just delay them).

Threaded Myomers, TL 12 (30 days)

The use of specially-conditioned artificial muscle fibers threaded into existing muscles via nano-enhancement, designed to supplement existing muscle rather than increase raw strength. These fibers reduce the stress and strain of using the muscles for long-term, sustained activity. The individual's carrying capacity is calculated as if they had +4 Strength and straight manual labor reduces fatigue at *half* normal rate (i.e. this person can perform twice as much manual labor before tiring, if they can otherwise stay up that long – this doesn't prevent you from getting sleepy, just tired out).

Cost: 75,000 Cr

Toughskin, TL 11-14 (30/45/60 days)

The outer layer of skin is made thicker, harder and able to take more damage, a subdermal layer is added that has been designed to counter projectiles and blades as well as disperse energy, there is also some modifications made well beneath the skin that also adds greater mass to the character, allowing them to absorb greater damage. The modification is progressively more noticeable in appearance at higher levels.

◆ **Task; Detect Toughskin at close range (5m):** *Recon*, Intelligence, 1-6 seconds, Routine (+2); **or** *Investigation*, Education, 10-60 seconds, Difficult (-2) without sensor gear or Routine (+2) with Sensor gear; **or** *Notice*, Intelligence or Education, 2-12 seconds, Average (+0).

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This accessory helps the chromer in two ways: it adds armor at the “skin level” (which stacks with body armor) and it helps reduce or “buffer” incoming damage. This second component does not change the character’s End statistic but “absorbs” a number of points of initial damage as if that value were added to the End characteristic (for wound purposes only). Note if the chromer has the Trooper Package, use the *higher* of the two (no stacking). **Note:** Each level also adds 10 kg to the chromer’s bodyweight (10kg at level I, 20kg at Level II, 30kg at level III).

Level	TL	Armor	Buffer	DEX	Costs	Check DM
I	11	2	2	-1	350,000 Cr	+0 DM
II	12	3	4	-1	800,000 Cr	+2 DM
III	14	5	6	-2	1,500,000 Cr	+4 DM

Armor: The natural armor gained from the Toughskin. Use whatever layering rules you would normally in your campaign if this is mixed with standard armor.

Buffer: The amount of added damage points that the character can take before marking off End. Essentially, extra End.

Dex: The penalty to the Dex (score, not DM) due to added bulk.

Check: The DM for the check to detect the toughskin at close range (5m or less on average). See above for base checks.

For Example: Olivia has Level II Toughskin, a Dex of 7 and an End of 8. Her Dex is now a 6, her End remains an 8 but she can also absorb 4 more points of damage than she could before (as if she had an End of 12). She’s in a bar being watched by an opponent who uses his Recon to determine if she has any weapons or cybernetics on her. He will notice the Toughskin with relative ease (total +4 DM). If he were using Notice skill (rather than Recon), this check would have ‘only’ been a +2 DM.

Z-Bones, TL 10 (180 days)

Nano-enhancements are used to make the bones like those of a Belter-SIM, physically lighter and more compact and yet able to withstand the long-term rigors of space (low gravity, long term radiation exposure, etc). The game effects of this accessory are largely long-term, but there is often a radical change in appearance from the shifting of the bone structure (the subject is thinner, more angular). Many who undertake this accessory either undergo facesculpting to restore their former appearance (somewhat, it’s never enough to be the same as the original appearance) or craft a new “Micro-Gee svelte” appearance based on their trimmer bone structure. Although some criminals adopt a new identity to go along with their new appearance. *Note: Z-Bones are generally incompatible with any other type of skeletal accessory.*

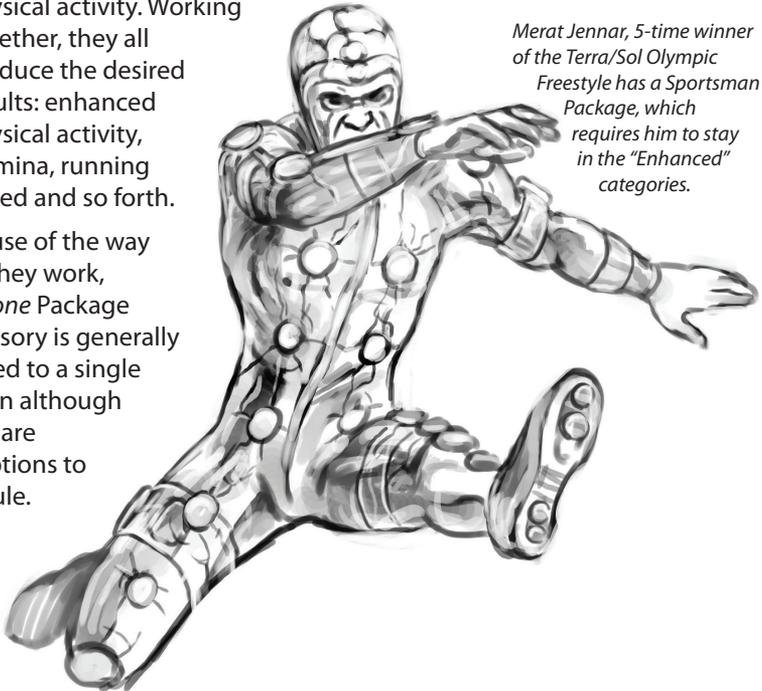
Cost: 150,000 Cr

PACKAGE ACCESSORIES

Package Accessories use a series of implants/grafts/nano-enhancements, along with hypnotraining and hypno triggers, that work together to produce a wide range of desired results.

For example: a “Sportsman Package” might use amplified heart muscle, along with artificial myomer threaded into the organ for additional pumping power; a nano-enhanced cardiovascular system that has been re-designed to handle the added blood pressure without ruptures or aneurysms; and finally a series of well-placed implants/grafts (along with hypno-triggers to maximize existing glands and hormonal systems) that are designed to produce key catecholamines which in turn stimulate physical activity. Working together, they all produce the desired results: enhanced physical activity, stamina, running speed and so forth.

Because of the way that they work, only *one* Package Accessory is generally applied to a single person although there are exceptions to this rule.



Merat Jennar, 5-time winner of the Terra/Sol Olympic Freestyle has a Sportsman Package, which requires him to stay in the “Enhanced” categories.

The No-Two-Packages Rule

Because several of the following packages involve changes made to similar glands, organs and so forth, the general rule is that no one can apply more than one package. While this is not an iron-clad rule, and there could well be some packages that do not target the “usual suspects” (the heart is especially common) the Referee may choose (entirely their discretion) to allow PCs to have more than one.

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The Allure Package (TL 11, 250,000 Cr or more, 45 days)

This package comes in a wider array than most, as they tend to be extremely proprietary. Major fashion houses have developed their own “look” as well as blend of cybernetics and engineering to attain it; the competition between them is fierce. The idea is to use a combination of fleshsculpting and implants to give the individual with this package maximum social impact. At least one agency has used the same techniques for much darker purposes, to literally create monsters, but this is far less common (as the individual implanted is subjected to the social stigma of a mutant...).

- ⚡ **Pheromones:** +2 DM to any social test with those breathing in the same air as the Chromer. Note that many mutants, some SIMs, and anyone who is taking a pheromone blocker will avoid this modifier.
- ⚡ **Striking Appearance:** This assumes fleshsculpting is used to maximize appearance and the subject “vamps” overtly. Gain +1 DM to any social tests (stackable with above when appropriate) for those who are sexually compatible with the chromer. If the individual is amenable to this seduction, increase the bonus to a +2 DM (aka “shooting fish in a barrel”). If the individual has good reason to resist (knowing that the chromer is dangerous etc.), give them an Int check with a DM set by the circumstances to avoid any modification at all. *Note:* that the fright-based variants of the Allure package use this +1 DM for intimidation and fear-based interaction checks instead.
- ⚡ **Manufactured Emotions:** Using hypnotraining/hypnotrigger and altered hormones to trigger genuine emotional responses internally, gain a +2 DM to *Art (Acting)* checks pertaining to the emulation of emotions (crying on cue, convincing someone you are scared et al) and all *Art (Performance)* checks. This does *not* stack with “Pheromone” effect.
- ⚡ **TMI:** The fleshsculpting, hypnotraining, and hormone controls also allow for enhanced sexual performance. So they claim. YMMV.

Fleshsculpting

What we might today call “plastic surgery” is referred to in the 30th century as *Fleshsculpting*. The techniques to make physical changes to appearance have been refined and simplified in many ways with the advent of nanotechnology (for fine control, bone planing, micrografting) and cybernetics/bio-replacement (synthetic nerves and skin for grafting, etc.), opening the door to amazing possibilities. Extreme fleshsculpting is generally avoided (lest the subject be thought a mutant), but ‘beautification’ is the most widely sought after application of the technology. Idealized forms can quickly grow very strange however; in some cases fleshsculpt jobs can border on the mutant-level (especially when certain parts of the anatomy are rendered into truly enormous proportions).

Cost: Anywhere from the 5,000 Cr to 100,000 Cr range for “average” sculpts.

The Healthy Package (TL 10, 500,000 Cr, 90 days)

This package replaces several organs (liver, spleen, Kidneys) with supercharged bionics and grafts and a variety of other gear that promotes overall health, boosts the immune system, and screens out toxins. The Healthy Package produces a myriad of small beneficial effects, less aches and pains all around, faster healing times, even slows natural aging (although this has little game effect as **Twilight Sector** has Longevity Treatments, see **Tinker, Spacer, Psion, Spy** pg. 168-170). In terms of popularity (as in people who want one), this package is second only to the Allure package; in terms of satisfaction (as in the positive feelings of those who already have it), this package ranks highest; those who have this package *feel* great. *Note:* This Package *can* be combined with the “Life-Extension” Package as long as it is done simultaneously (90 days healing time for the combined total).

- ⚡ **Boosted Filtration System:** +2 DM against all poisons and toxins (plus modified End DM). Alcohol has little effect on their body, as well as about a third of medicinals. Unless a medtech providing first aid is aware of this, roll a d6: on a 1 or 2, the character only gains half the normal effect of the *Medic* check. Artificial Pheromones also have a reduced effect (reduce DM by half, rounding down)
- ⚡ **Natural Panacea:** The character’s system acts like it has a constant supply of the *Panacea* drug (TMB pg 94). Make a *Medic* check as if the character had *Medic* 0 treatment for any infection or disease, using their supercharged Endurance as the stat DM (see below). Simple infections are dealt with in a fraction of the normal time and long term infections almost never get a chance to set in.
- ⚡ **Supercharged Endurance:** The characters normal End DM is increased by +2. A character with 9 End (+1 DM normally), now has a +3 DM. The actual Endurance score is unchanged. Note that this is one of two examples of a DM change (see next page).

The Life-Extension Package (TL 11, 250,000 Cr, 60 days)

This package has nothing to do with Longevity. Instead, it helps to protect a character who has suffered from a mortal or near-mortal trauma. 30th Century medicine can restore the recently dead to life, but only if they have been found and worked on within the “golden hour”, after this limited rejuvenation of brain cells and other cells (heart muscles and so forth) are too extensive. The Life Extension Package makes modifications to several key systems and adjustments to specific organs that extend that from “golden hour” up to a half-day (actually, to 4+d6+END DM hours).

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It can also help with near-death. If the character is brought within 0-3 points in their last characteristic, this Package can be triggered *before* they are dead. The surge of hormones, adrenaline and cardiovascular “boost” delivers a jolt to the system within d3 minutes of their trauma. This restores d6 characteristic points to the nearly dead individual and for 30 minutes after allows something approximating full ambulation (i.e. 3m base movement rather than the usual 1.5m). If this “near-death” jolt is triggered, and the character goes on to take further damage which reduces them to below 0 points, the “golden hour” in which revival is possible shrinks considerably (to $d6 + \frac{1}{2}$ End DM in hours) as part of the hormones and energy needed for this extension was used up in the jolt. After a day of rest and care/or at least solid nutrition, the system is restored enough to be at full capacity once more.

Note: this package *can* work with either the “Trooper” Package or the “Healthy” Package (not both).

The Sportsman Package (TL 11, 450,000 Cr, 60 days)

By increasing several key muscle groups (not full Artificial Muscle Bonding, similar to limb reinforcement), improving the cardiovascular system through nano-enhancement (to prevent stress/catastrophic failure on the blood vessels), increasing the size and strength of the new (bionic) heart, grafting several hormone stimulators and a few dozen other adjustments, this package will help make a better sportsman out of the subject. Food intake is increased by 150%.

- ⚡ **Increased Speed:** Increase ground speed by +1.5m/minor action (or +3 meters/minor action if they are “up to speed” after three combat rounds worth of acceleration).
- ⚡ **Athleticism:** +2 DM to all *Athletics* checks (all specialties, this may not be stacked with any skill augmentation or other direct aid to *Athletics* skill), with the exception of jumping and swimming checks (+3 DM instead) and throwing checks (+1 DM, but this may be further enhanced by skill augmentations or some other accessory)
- ⚡ **Adrenaline Surges:** Intermittently, the character can pour on extra energy (adrenaline and other hormones), increasing their **DM** for Strength and Endurance by 1 each temporarily (note: not the raw score in this case, but the DM). Once triggered, the effect lasts 3+d3 minutes, but cannot be done again for 6 hours and inflicts the effects of fatigue for 2 hours.
- ⚡ **Extra Vitality:** Add Strength DM along with End DM to resist stunning checks (if using the standard rules for stunning from TMB) or reduce stun damage by $\frac{1}{2}$ the Strength DM (rounded up) (if using the Twilight Sector variant stunning rules).

The Survival Package (TL 11, 300,000 Cr, 90 days)

This package makes changes to a wide variety of different organs, kidneys, heart, lung and so forth. In all, over a hundred different grafts and nano-enhancements are used to maximize the ability of this individual to survive in the wild spaces.

- ⚡ **Reduced Intake:** Reduces the need for food and water to 50% normal for moderate durations. If the character has any intake modifications, these are calculated *after* the 50% reduction. This can be maintained for 1 month, or up to 4 months with occasional “binges” (windfall additions to the diet)
- ⚡ **Broad Toleratation:** Reduce damage from the environmental effects of heat or cold by 2 points. *Note:* this is far from immunity.
- ⚡ **Para-Instinctual Responses:** +2 DM to all *Survival* Checks thanks to a tweaked instinctual response by hypnotraining/ triggers and other mods.
- ⚡ **Dietary Expansion:** The chromer can metabolize a broad range of food, giving an additional +2DM to forage checks (stacks with above).
- ⚡ **Tweaked Immunity:** +2 DM against infections, poisons and toxins, including diseases that are *natural* (Biological agents that are based on artificial chemistry would *not* be included).
- ⚡ **Wakefulness:** Fatigue limits are half-again normal (the character can for example go for up to $27+1\frac{1}{2}$ END hours before sleeping, so an END 10 character can go for $27+10$ (END)+5 (Half END)=42 hours before becoming fatigued).



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The Trooper Package (TL 12, 750,000 Cr, 180 days)

This package incorporates enhancements to a wide variety of internal organs to maximize the battlefield survival of an individual soldier. Note: This Package can be combined with the "Life-Extension" Package. Food intake must be increased by 150%.

- ⚡ **Situational Awareness:** A series of hypnotic and sensory adjustments provide the Trooper with a +1 DM on *Recon* checks. The Trooper also gains an additional +2 to their Initiative checks (this *does* stack with other benefits). It also makes them "jumpy" (roleplaying).
- ⚡ **Wakefulness:** Fatigue limits are half-again normal (the character can for example go for up to 27+1½ END hours before sleeping, so an END 12 character can go for 27+12 (END)+6 (Half END)=45 hours before becoming fatigued).
- ⚡ **Increased Speed:** +1.5m added to the Troopers base speed (Simple Action Movement rate), this can be stacked with other advantages (like Swiftshod feet).
- ⚡ **Reduced Heat Signature:** Natural fibers and skin coatings combine to mute heat signatures. Imposes a -2 DM for anyone trying to locate the Trooper using thermographics alone.
- ⚡ **Mid-Lung:** Diaphragm adjustments and rib alteration allows the Trooper to add a third lung. This new lung adds at least 3 minutes to the time they can hold their breath naturally (usually around 45 seconds for an unmodified individual), this can be increased by a special check:
 - ◆ **Task; Filling the Tri-Lung:** *Athletics (Endurance)*, Endurance, 10-60 seconds (spent deep breathing), Routine (+2). Each point of Effect extends breathing time by an additional 15 seconds.

Additional modifications allow the Trooper to "shut down" normal breathing which prevents them from taking in tainted or poisoned air (they still only have 3+ minutes worth of air), they also bypass reflexes associated with holding their breath (i.e. no "burning lungs").

- ⚡ **Structural "Buffering":** Through structural tweaks and hypnotriggers, an additional 2 "buffer" points are added to each stat *but only for resisting damage*. This does not increase the statistics (the base value and the DM are both unchanged). This element of the Trooper Package stacks with the Toughskin Accessory "Buffer" but only partially, with the *higher* of the two benefits used to increase the damage-absorbing component of End (i.e. don't add the "buffer" from Toughskin and the additional 2 points together, use the better of the two different bonuses for that portion added to the End), obviously the additional 2 "buffer" points are added as normal for the *other* two stats.

TEMPORARY ACCESSORIES

Not truly chrome *per se*, there are for temporary use or get flushed out of the system with time. Temps come in two basic forms: *Medicinals* such as combat drugs and other pharmaceuticals and *Applications* which are hardware that are not ingested/imbibed/injected as medicines but used then dropped when “empty” or “spent” (or simply no longer needed).

MEDICINALS

Leperstat, TL 10

This drug, taken in pill form, deadens the ability of the user to feel pain roughly a half-hour following ingestion. This does reduce some aspects of damage, such as shock, but by-and-large it only masks the effects of wounds, it does not prevent them or heal them. No penalties on actions are incurred as a result of wounds, and once the character has taken a major wound they are not reduced to limited mobility (their ground speed is reduced by d3, although Referees who have some more specific idea what kind of damage has been incurred should simply set this penalty rather than roll). The effects last for 18 hours. Many users find that they can do rather significant damage to themselves while under the effects of the drug because they don't know that they are doing something that hurts (pain is an indicator of damage after all). Resisting physical torture becomes almost ridiculously easy, pain-induced checks need not be made at all. Some users will fake (using *Deception*) pain reactions from this kind of torture to deliberately waste the interrogator's time. It definitely sucks when the leperstat wears off though...

Cost: 250 Cr/dose.

Oxyre[®], TL 9

A drug created by the TransGen Corp to aid long-term habitation on the Prison Planet VanKila Kiertotahti. Oxyre[®] blocks excessive CO² from being absorbed through the lungs (normal CO² exhalation is unaffected). Oxyre[®] isn't metabolized quickly and stays in the system for a long time. The drug is a monitored substance in the V-K system.

Cost: 5 Cr/dose.

Pheromone Blocker, TL 10+

These drugs are designed to block pheromones that trigger emotional responses chemically. This is actually an entire class of medicinal drugs, which come in a variety of different forms (pills, injections and elixirs). While these blockers make the user immune to the effects of pheromones, they also induce an insensitivity to all normal

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social interactions (-2 DM on all social actions the user attempts while taking this drug as well as a -4 DM to any effort to detect the emotional state of others). Long term use may cause mental instability (depression and/or paranoia being especially common).

Cost: 50 Cr/dose (pills, effects start 30 minutes after taking and last roughly 4 hours), 65 Cr/dose (ingested elixir, effects start 15 minutes after imbibing and last roughly 2 hours), 100 Cr/dose (injection, effects start d6 minutes after injection and last roughly 8 hours).

Sleeper, TL 9+

This compound, which can be taken in a variety of forms, places the user into a death-like state, similar to suspended animation. Once in this state, the user only requires minimal life support (although if they are subjected to intense cold, they will need to be re-warmed before being brought out of this state and could suffer from significant damage in the process of ice-crystal formation). The ability of this drug to “fake death” is well-known, but many formulations of the drug itself are deliberately difficult to detect. Note: Different chemicals have very different side effects and telltale pharmacological or morphological signatures, and literally dozens of different drugs exist that create this effect, each one has it's own specific issues and “cures”. Most sleepers will wear off after a period of time determined by the dose (a few hours to a few days).

Cost: 500 Cr/dose.

Targeted Platelets, TL 12

This is a transfusion (requiring d6x5 minutes total to introduce to the system via intravenous means) of specifically tailored blood plasma that helps reduce the impact of a major trauma within the next 3+d3 days (after which the platelets break down on their own). The targeted platelets have nanotech “minders” which allow them to be used on trauma sites rather than simply turning the blood into paste within the veins. The effect of this injection is to give a “boost” of d6 characteristic points to a character that suffers from a wound that involves more than 6 points of damage (under this level of damage, the targeted platelets are not activated). The only “problem” is that these boosted points only come back if the character is reasonably still and only after 10+d6 minutes. Maintaining physical activity prevents the targeted platelets from activation. Once the targeted platelets have been released/used or after the time has been elapsed, they are expended and no longer available. Note: these must be *calibrated* to a specific user in a lab (a *simple* check).

Cost: 1,500 Cr/dose (which includes “calibration” costs)

APPLIANCES

Appliances are hardware, useful for temporary purposes or as adjuncts to existing implants.

Data Collectors, TL 9+

Neural-links can only sustain so many direct inputs, but multiple sources of some data can appropriately be “bundled” together (Multiple camera feeds, multiple weapon systems, sensor equipment etc) to economize those inputs. Data collectors allow these passive inputs to be combined into a single “feed” for the Neural Link.

Most Data Collectors use close-range transmitters for connections, although they can use hardwired plugs or induction plates for greater security (-2 DM to hacking/Jamming efforts) and minimal costs (+10-100 Cr). Unit size is dependent on how many inputs, and how many physical plugs, the Data collector presents: ranging from the size of a hard candy or throat lozenge for a 2-4 input wireless passive-only model to the size of a 21st century computer keyboard for a 25-plug input wired active-control unit.

Cost: 50 Cr/input (passive only, no active control, so the sensor settings or camera controls have to be routed separately), 500 Cr/input (one of the inputs can be controlled at a time, this takes a significant action to become “active”).

FauxMask, TL 11+

Fauxmask technology molds pseudo-skin to the face and hands to duplicate the appearance of specific individuals. Fauxmasks typically use compression technology to minimize the contours of the disguisers own face as much as possible (a thin spray that shrinks as it sets and tightens the skin on face and hands to avoid the “pudgy look”, which is a dead giveaway that one is masked). This compression spray is a key to success in impersonations of specific individuals, but also the primary drawback of this technique (specifically a lack of comfort). Note that some impersonations don’t require compression and others are simply impossible given the basic contours of the face (See textbox on next page).

The Fauxmask itself is produced by a specialized production workstation (approximately the size of a small suitcase) that builds layer upon layer of pseudo-skin based on a scan of the subject to be copied and requires a high resolution 3D scan of the subject (or the individual to be copied to be physically present). The Fauxmask can be donned with a significant action.

Overall this technique achieves a more natural appearance, which can resist even limited tactile examination and scanners that are not

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designed to penetrate deep into skin tissue. Note that Fauxmasks are also useful for non-impersonation disguises which generally do not require compression and thus can avoid that particular set of complications.

Cost: 25,000 Cr for the basic (briefcase-sized) mask-production unit; the Mask-production unit generally carries enough supplies to create 8+d3 masks before requiring a “refill” of some type of raw materials (which costs about 1,500 Cr)

Holonets, TL 10+

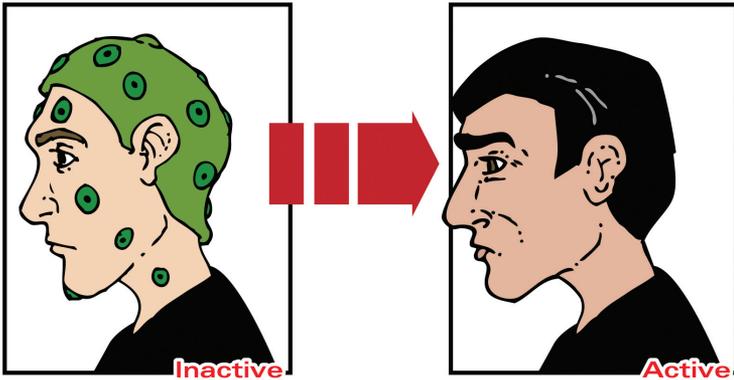
Holonets use holographic technology to build a “face of light” for the user, concealing identity and possibly copying another individual. While effective, they are subject to certain problems (notably specific countermeasures). This technology is illegal in most Stellar Nations (including the Orion Confederation), but is easily produced/reproduced, making a cottage industry among the criminal set. Tiny sensors are placed into a “mist” solution that is applied to the face. These sensors capture changes in expression and movement. A “skullcap” festooned with holoprojectors is then placed over the hair and then individual holoprojectors are fitted onto the face at key points to provide the holographic over-image. The specialized computer built into the skullcap stores the high-density images (the number available is based on Tech Level: three images at TL 10, nine at TL 11, eighteen at TL 12 and thirty-six at TL 13).

The Hologprojection is near perfect. Beyond visual appearance however – for example a “pat down” – Holonets are less useful. In terms of game

Faux Mask Complications

The discomfort due to the compression technology causes a -1 DM to all conscious actions after 10-60 minutes of use, -2 DM after this (maximum usage: 8 hours); these modifiers are based on a combination of pain and muscle tension in the face and hands; it cannot be controlled pharmaceutically because both the face and hands have to remain flexible for the disguise to be of any use. The mask can be removed by the use of a special spray or by tearing it away in chunks (either of which eliminates the negative DM immediately, tearing requires a minor action).

If the Fauxmask is not being used to duplicate a specific individual, the compression does not need to be a limiting factor; masks still dry out and crack over time and are only good for a maximum of 8 hours. There is also a functional limitation for disguises that emulates certain subjects: Some people simply cannot duplicate specific faces due to size or bone structure. The Referee should first determine if it is even feasible (their discretion) then, make a d6 check: On a 1-3; Yes, the face may be copied. On a 4: Sort of, close but not accurate, the mask can only fool people at a distance. On a 5-6: No, the face may not be copied (bone structure is too different).



mechanics, this technology does not so much grant the *disguise* skill as much as it facilitates the use of that skill. It is also a good way to get past cursory exams. The emitter technology (which is shielded) goes through a continuous tug-of-war with counter-emitter technology — scanners designed to locate emitters at close range (4m). If confronted with efforts to detect, jam, or disrupt, compare the Tech Levels of the two units (Holonet and counter-device). The “winner” is the higher tech level device (if they are even make a simple 2d6 check, 8+ indicates no detection/disruption). Full body versions of the Holonet are also possible that mimic body dimensions and clothing.

Cost: 7,500 Cr (TL 10), 10,000 Cr (TL 11) 12,500 Cr (TL 12), 20,000 Cr (TL 13). Full-body versions cost triple. Holonet detectors cost 10% and jammers cost 25% of above. While TL 14 and TL 15 models exist, they usually cost whatever price the local marketplace is willing to bear.

HUDtacts & Mastoid Audiolink TL 9+

HUDtacts are appliances mimic the effect of the Heads Up Display or HUD Sensory Enhancement (see page 21-22). The data they display can come from a variety of different sources, with a hand-held computer that routes the data directly into the contacts, although an IT can perform the same function as an external computer.

The *Mastoid Audiolink* is a skin-toned strip that fits over the mastoid bone and performs a similar function to the audiolink enhancement (see Page 21). It sends sounds directly to the inner ear by way of bone induction. This appliance can be used in conjunction with the *HUDtacts*, even sharing the same routing programs.

Cost: 125 Cr (*HUDtacts*), 50 Cr (*Mastoid Audiolink*), a computer is purchased separately, although the program to route the images is a 10 Cr Program/0.

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Mobilizers, TL 9+

These temporary accessories affect the movement capabilities of the user, allowing someone with an injured hand or foot to use their broken/smashed or otherwise immobilized limb 'normally' (or some close facsimile). The unit takes a bit of getting used to, and runs either through a passive neural input or a 'trode interface' (see page 99, a simple trode will suffice). Robotic frames control the position and make motions for the limb that is being assisted. Note that for some wounds, even this technology is inappropriate (wounds that damage/cause pain when the limb is moved for example), and the Referee will make the determination if a mobilizer will compensate for individual cases. In game terms, the mobilizer eliminates -2 DM worth of penalties from a damaged (or recently implanted) limb. Lower tech level versions generally require more mounting hardware (braces and so forth to support the weight of the mobilizer itself, usually strapped in under clothing).

Cost: 1,000 Cr/arm, 750 Cr/just hand & fingers, 1,250 Cr/leg, 900 Cr/ just ankle/foot. The 'trode, even if integrated with the unit, must be purchased separately.

NID-Bridge, TL 12

This application facilitates a data-link between a specific piece of equipment (one that has no wireless transmitter installed already) and the chromer's Neural-input wireless connection (or a HUD or an IT). The user creates a secure multi-coded wireless connection between the chromer's Neuro-Link and the NID-Bridge, then connects the Device in question to the system. This makes it more difficult for an outsider to hack the chromer's signal (since they are only using secured wireless connections). The standard Wireless Bridge can also act in "contact only" mode for an ultrasecure connection that is almost as good as hardwiring (-2 DM to hacking/jamming efforts).

Alternative NID-Bridges can be made *induction only* (usually wrapped around handles), *Wired-only* and *Wired/Wireless* combination systems. In essence any NID-Bridge is a TL 12 retrotech computer/2 specialized to run Security Programs with an attached short-range/high bandwidth communications device. The Security program that comes with the NID-Bridge is useless (Rating/0), but the system can be loaded with up to a Security/3 program (purchased separately of course).

Cost: 165 Cr for a standard (0.25kg) unit (range 10m); 100 Cr for an induction-only connector (0.125 kg); 150 Cr for a wired-only system, with a 2m cord (0.375 kg); 200 Cr for a Wired/Wireless combination (0.4 kg).

Dude, I dig your Ride

Personal Transport devices have been around for over a millennia, but “rides” have been extremely popular since the technology to create Sub-Torso chromers became possible in the late 24th Century. Many historians point out that Rides were in use before that point as well, although in slightly different form from the durable and recognizable design that emerges in the late 2360’s.

The “ride” comes in two different formats, “frames” those which are connected to sub-torso chromers and “standalones”; those which are used by everyone else. Effectively, the end result is the same (in terms of game mechanics), although special mounting brackets and safety controls have to be built into the standalones (and standalones do not have to incorporate life support tech and so-forth, in the end it is more or less even).

Standalone rides are balanced using gyroscope technology that dates back to the days of “Ginger” and the “iBot” wheelchair of the Long Pause Era. The rider sits atop the ride, straddling the main drive and powerplant, and has no windscreen or safety cage. Instead, their legs are clamped in, and a special harness belt helps them to maintain their seat during high speed maneuvers and high-flying grav-based stunts. If you examine the image on Page 41, you’ll note that while the figure in the foreground, who has also found his way below, is a Frame-format Ride, but the figure *behind* him is on a Standalone Ride and clearly has legs of his own.

Beyond the formats, there are also many different *models* of ride: wheeled, tracked, Grav, GEV and four- or-more-legged being the most commonplace. The specifics for the different models are found on the chart on Page 41.

Beyond these, other types of rides exist, even underwater-types (which incorporate life support systems as well) and Space types (which use a mixture of Grav and directed air to push them about in microgravity.



The classic Miniquad Ride (the two rear wheels are small and inset.)

Techbook: Chrome

Pheromone Inducers, TL 12

This temporary accessory is often combined with a perfume of some sort (it is listed as an appliance rather than a medicinal because it is not injected or taken orally but sprayed on externally). The pheromone targets the Jacobson's Organ, a part of the olfactory system designed to pick up these chemical triggers. There are a wide variety of pheromone inducers which can produce different effects in others: *sexual arousal* (always popular), *loathing* (sometimes sprayed on criminals by LEOs during/after an arrest), *trust* (commonly used in abusive ways, but originally designed to be used for therapists and medical professionals). The game effect is to produce a +1 DM to any social test geared towards that particular emotion on those susceptible to pheromones, or a +2 DM if the pheromones are engineered to be tailored specifically for the user. *Note:* that the Allure Package re-engineers existing pheromone producing mechanisms and so can produce pheromones of a much wider range, the pheromones used by this application are "set" to a particular type (i.e. one pre-determined emotion).

Cost: 200 Cr/dose (generic), 550 Cr/dose (engineered for a specific individual, this takes a commercial lab about a week or about six hours if done "at home" with a skill check).

◆ **Task; To craft a specifically tailored pheromone:** *Life Science (Biochemistry)* or *Physical Science (Chemistry)*, Education, 10-60 seconds, Difficult (-2); **or** *Trade (Pheromone Production)*, Education, 4+d3 hours, Routine (+2). A DNA sample/profile is necessary.

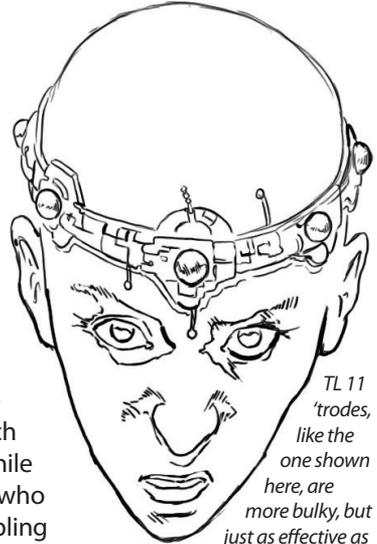
Trauma Dressing, TL 11

These wads or lumps of whitish or greyish goo can be slapped onto a wound during or after combat. They help to control blood loss and keep wounds from being open to the outside world as well as pump stimulants and artificial enzymes into the body. Once activated, the dressing moves into shape and clamps over the wound on its own and will not fall off accidentally. The game effects of the Trauma Dressing take d6+End DM minutes to set in (larger individuals may need more time for the drugs and active elements to start showing effects), and restore d3+1 points to the user. *Note:* This appliance replaces first aid (in some cases, first aid might do more for the patient, something to keep in mind). The dressing can be removed in the field within an hour of the first wound taken in order to provide normal first aid, but the points that were restored by the Trauma Dressing will be lost.

Cost: 1,000 Cr/Dressing

'Trobe, TL 10+

The 'trobe is an appliance that acts as a non-surgical NID (Neuro-Interface Device). 'Trodes allow the user to command computer interfaces (thinking commands directly) or control equipment like Neural Plugs. This tech also allows the human mind to receive data directly from external sources. In fact, this is how most of the 30th century population uses this technology — as entertainment interfaces for Virtual Reality (or VR). For this reason, 'trodes also come with *voluntary override circuits*, which allow users to “shut down” their bodies while participating in VR. This prevents people who are immersed in virtual reality from stumbling into traffic or waving their arms around as they control devices cybernetically. Concentrated effort can bypass the voluntary override, but casual users will not embarrass or endanger themselves. There are two basic types of 'trodes:



TL 11
'trodes,
like the
one shown
here, are
more bulky, but
just as effective as
TL 12 models.

- ⌘ A Maintech (TL 12) *simple 'trobe* is a circlet no thicker than the finger that fits over the head in any one of a dozen different styles. Simple trodes can only handle a single connection, and the reception quality is minimal (images appear ghostly).
- ⌘ The *full-immersion (or Cyberspace) 'trobe* is a helmet that fits over the users head, providing greater connection to the brain in quality and quantity of data. Images appear sharp and crisp, sounds have lifelike clarity. The unit can also handle three different digital connections (only one of which can be actively controlled, as with Neural-Plugs). Higher priced TL 13 and TL 14 versions are somewhat smaller and less obtrusive, but operate the same.

While 'trodes have a plug interface (one for simple 'trodes and three for the Full-Immersion 'trodes) they generally send/receive data wirelessly (base range is 2m). Some users feel that 'trodes are slightly less responsive than Neural Plugs, but they have no difference in game mechanics terms.

Cost: 250 Cr (simple); 1,500 (Full Immersion, TL 12); 2,250 Cr for a TL 13 and 3,500 Cr for a TL 14 unit, the difference is size/bulk). Many 'trodes also incorporate comm-links, hand computers and or other gear (which must be bought separately)



A somewhat whimsical (Space) vehicular cyborg shell used by the explorer and philanthropist Jonah P. Mencken, seen here with Jonah's life partner Günter Strangways in his "rider" seat atop the shell.

CYBORGS

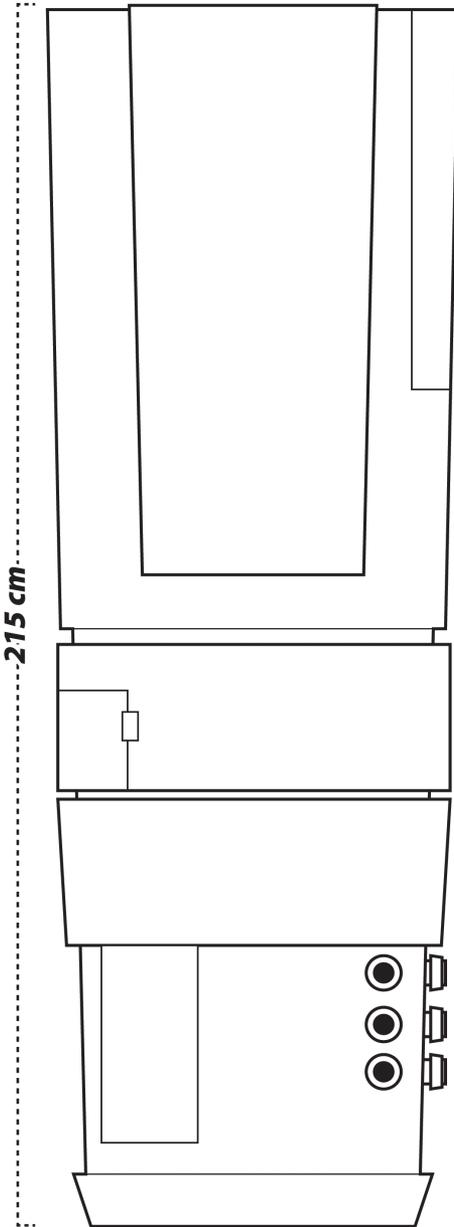
A cyborg is a human being (or uplifted species) whose brain (and possibly some vital organs) have been preserved and their bodies replaced by robotic shells. In some areas of the Known Galaxy, cyborgs are referred to as *Maltzer Artifacts** and other, less comprehensible names or titles; but the term 'cyborg' is near-universally recognized even where it is not in common use. While some see cyborgs as another kind of Ghost, the two are actually very different. The *Ghost* is a digital entity encoded with a (deceased) human personality which resides in the shadowy confines of the internet and occasionally uses robots and biocons to interact with the physical world; while the *cyborg* is a physical being that retains the last shred of their humanity who simply resides inside of an artificial body or other housing.

In the ***Twilight Sector Setting***, the cyborg has been around for several hundred years in one form or another, but cyborgs have never made up a significant percentage of the population. Increases in medical knowledge have actually diminished the percentage of cyborgs in the population generally, as those who would have been saved only by transplanting their brains out of ruined bodies can now be saved on the operating table (in the ***Twilight Sector Setting***, there is even limited resurrection of the recently dead). Likewise, bio-replacement technology has rebuilt men and women who would once have been made into cyborgs as the only viable possibility for long-term survival. Despite this larger trend, the recent Mutant War/War of Expansion has artificially increased the number of cyborgs among ex-military personnel and civilian war casualties caught in the crossfire.

A critical component of the cyborg is the machinery that houses the brain, known as the **Life Support Unit** (or LSU). The cyborg's robotic body is known as a **shell**, but is little different than any other drone. Technically, *robots* are autonomous while *drones* are used by some other agent/intelligence (such as a digital entity); the use of the term 'robot' however is traditional for describing cyborg bodies. It is also hypertechnically accurate, since the combined unit (LSU and Shell) is certainly autonomous. Few but the most annoying sticklers will press the point.

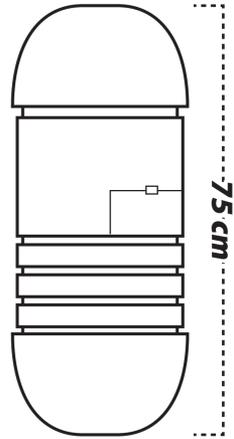
***Who the heck is Maltzer?**

This is a reference to the scientist in C.L. Moore's "No Woman Born" (1944), a great cyborg tale. Although this factoid has become effectively lost in the setting.

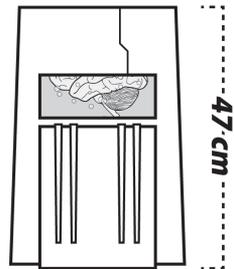


TL 10 "Coffin" Model

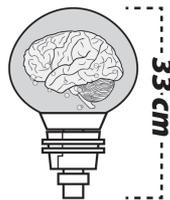
TL 12 Model



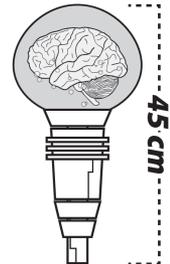
TL 13 Model



TL 14 Models



"Standard"



"Durable"

Several different versions of the Life Support Unit, or LSU, used for cyborgs

Tech Level 10: Basic Viability of Cyborging

At TL 10, viable cyborgs make their introduction. Computers directly interface the brainstem, while synthetic organs mimic hormones and other biological necessities are incorporated into the life support unit. The result at this stage of technology is a somewhat sizable LSU, approximately the size of a coffin (0.7 m x 0.7 m x 2m or ½ dton).

At TL 10, the activity of the cyborg is limited to certain durations (roughly 7-12 hour intervals) before the brain must be rested (literally placed into a chemical slumber for 6+d6 hours to recuperate, without this Intelligence and Education characteristics are both reduced by 1 as if damaged and will take 1 day each to recover).

Generally, cyborgs can only be housed in a very large robot or a vehicle at this tech level. The size of the LSU prohibits anything smaller. In 2991, this level of technology is available at any major medical facility, and is often utilized as a stop-gap (i.e. a normal hospital can jar the brain after initial damage, then later a higher tech level life support unit is built for transferal in a more high tech clinic; in this case the character only has to pay the difference in cost for the higher tech level equipment as they “step up”). *Cost: 2 Mcr* (at maintech costs, far higher when first introduced).

Tech Level 11-12: Maintech Cyborging

Maintech sees gradually the diminishing size and weight of the life support unit, a box-like 0.7 m x 0.7 m x 1 m (or ¼ dton) at TL 11, and a 0.3 m x 0.75m cylinder at TL 12. At TL 11 & 12 the basic technology of the LSU also improves significantly: increasing the amount of time that the cyborg can be active between chemical “slumber” periods (10-15 hours at TL 11 and 13-18 hours at TL 12); and decreasing the amount of support required (this is required daily at TL 11 and weekly at TL 12). The duration of chemically-induced slumber is just d3+3 hours between activity cycles.

While the cyborg can be placed into a robotic body at this tech level, the shell would still have to be larger than man-sized (an example of this is the “Lobster” Shell on Page 109). In 2991, this level of technology is available at special facilities on maintech worlds (often as few as 1 or 2 on a whole planet per billion inhabitants), or in the top 20% of medical facilities on Hightech worlds (i.e. at “better hospitals”). *Cost: 3* (TL 11) *and 4 Mcr* (TL 12) at maintech prices.

Tech Level 13: Efficient Cyborging

By TL 13, the Life support unit has shrunk to a 0.3 m x 0.47 m cylinder. There is only need for external support (monitoring and checkups by

Techbook: Chrome

medical professionals) on a monthly basis, and in many cases these checkups will only indicate minimal tweaks/changes. Chemically-induced slumber is no longer required, as the balance of chemistry used for the brain inside of the LSU has finally been perfected. Normal rest periods come when the cyborg grows tired, usually after 18+ hours, and requiring only about 3 hours of sleep to help reset cognitive functions; the cyborg requires less sleep generally than the non-cyborg because that rest is solely for cognitive purposes (no need the rest the body).

The LSU is much smaller now, and can reasonably fit inside of a slightly-larger than human-sized robotic body (tightly). In 2991, this level of technology is available on Hightech worlds to those who can afford it, but requires trained medical specialists at top notch facilities (the top 5% of medical facilities). *Cost: 8 MCr*

Tech Level 14: Reliable Cyborging

By TL 14, the standard Life Support Unit is a 0.22 m x 0.33 m cylinder, and comes in two basic types: the "standard" unit and the larger (0.22 m x 0.45 m cylinder) "durable" unit which can take more damage (it has several backup systems). Monitoring continues to be monthly, and more and more of these checkups require only minimal changes. Normal rest periods are in place, as with the previous tech level.

The cyborg can be placed in a smaller-human robot frame if needed, or into a better protected larger "durable" life support unit that can still fit into a human-sized robotic frame. In 2991, this level of technology is available to anyone who can afford it on a High tech world, and only then at cutting edge hospitals and specialized clinics/installations (the top 1% of medical facilities). *Cost: 12 MCr* (standard unit), 16 MCr ("durable" unit).

Tech Level 15: Peak Cyborging

By TL 15, the standard life support unit is approximately the same size of an TL 14 LSU (a 0.20m x 0.30 m cylinder), it is also automatically "durable" by design. Monitoring and rest periods are as they were for the TL 14 and TL 13 models respectively (monthly checkups, 3 hour rest periods).

At this level of development, the LSU can be placed into smaller than human-sized robots even with the added security of durability. In 2991, this level of technology is available to governments and larger corporations and their personnel, and requires access to an expensive (and usually secret) facility to install. *Cost: 20 MCr*.

LSU CHARACTERISTICS

The LSU not only protects the brain of the cyborg, it also provides, inherently the following advantages:

- /// **Neural Interface:** A 5-point Neural-Plug is incorporated, although one of these connections is required to receive sensations and provide control of the robotic body/shell; this connection can be manually overridden by the cyborg and retasked, but doing so makes the cyborg's "body" go "lifeless" and the LSU will receive no inputs from it (in essence, rendering them senseless as well depending on what else they are connected with at the time).
- /// **Sensory Impressions:** the LSU hardwires in all sensory impressions (the sensations themselves have to be picked up by the body, which is why the single neural connection to the shell is still needed) acting as a kind of HUD/Audiolink system. Some shells will lack certain sensory inputs (i.e. no sensory "feed" to the LSU).
- /// **Integrated Command System (IT/ISP):** The LSU also incorporates an IT that runs independently of the dedicated computers that serve a life-preserving function. Use the highest computing value IT for that tech level, although for lower tech level models it is not uncommon to install higher tech level ITs as soon as they are at-hand. Ignore wound condition checks (although LSU hits may disable these systems, referee's discretion). The integrated command system also provides the same *effect* as chipped reflexes (as in to coordinate the system translating mental impulses into physical motion). In effect, therefore, this system acts just like an ISP (or Integrated Skill package, see Page 72).

Also, many subsystems can be installed (usually in the shell itself) that can be easily connected to the LSU without requiring surgery. Thus a squawk box (incorporated into almost all shells for the cyborg to communicate with) does not require surgery in order to function, nor does the visual and audio pickups. This produces a significant savings over using equivalent cybernetics (no need to surgically alter/attach).

Other Statistics:

The character's strength and dexterity are determined by their robotic forms. Outside of the *Prince/Princess* models which are more organic than mechanical, the cyborg's Endurance characteristic is no longer much of an issue. In terms of the cyborg's physical integrity, this is a matter for the Hull and Structure statistics of their robotic shell. Some additional considerations to keep in mind:

It's Got What Cyborgs Need! It has Electro-lights!

Cyborgs actually do eat. Sort of. Although many robotic shells have taste sensors, the cyborg generally uses nutrients in the form of purified glucose and other necessary chemicals attached to the LSU (commonly referred to as glucose-plus). This is because cyborgs generally do not have the complex biosystems for digestion (they *can*, but the artificial G-I tract is not a big seller for some reason). Because cyborgs have no body fat or other bio-tissue to draw from in case of 'deprivation', the glucose-plus mixture needs to be on a constant drip.

Generally, the LSU has a full 24-hours worth of glucose-plus (for normal activity) on hand, and most cyborgs change out the stores of this nutrient every time they recharge. If the cyborg is caught without nutrient, the LSU forces them into chemical slumber, often sending out distress messages (although this can be overridden simply enough).

- /// The brain box still requires oxygen. Rather than carry all of the air required for the cyborg for long periods, the shell takes in normal air and concentrates or filters as needed. However the LSU can go into "self-contained mode" as there is a compression tank used for recycling with 1 hour (TL 10-12) or 30 minutes (TL 13-15) of air for the brain. Additional air tanks can be installed internally or externally, each 2-liter bottle providing 8 hours of air when the cyborg is in self-contained mode. Likewise, heating/cooling of the brain inside the LSU must remain constant, so if the cyborg enters extreme conditions (such as the vacuum of space, or hazardous environments) the battery will drain twice as fast as normal (4 hours of constant activity, 12 hours of normal activity, and 24 of minimal activity for a "basic" shell).
- /// The LSU is (electrical) shock resistant, and does not suffer from most sonics (unless the sonics are sufficiently powerful to cause vibration damage, in which case damage is handled like any other damage).
- /// The LSU's shielding resists up to 100 rads, and most shells add a further 100-300 of protection to this (more for larger units, less for smaller units; sometimes that extra bulk comes in handy).
- /// If it is an issue of the remaining organic parts and their ability to fight off a disease, consider the cyborg's End a 2 (-2 DM) for disease/toxin purposes and a 7 (+0 DM) for other purposes. However, the character is in a world of trouble when something gets that far "inside" the LSU anyway.
- /// The LSU is considered "fully hardened" but their robotic shells are only "semi-hardened" against EMP in **Twilight Sector Setting** terms (using the optional rules from **Starfarer's Gazette #1**). When an EMP weapon is set off, the shell technology shuts down for a somewhat variable amount of time depending on local conditions (see EMP Effects chart).

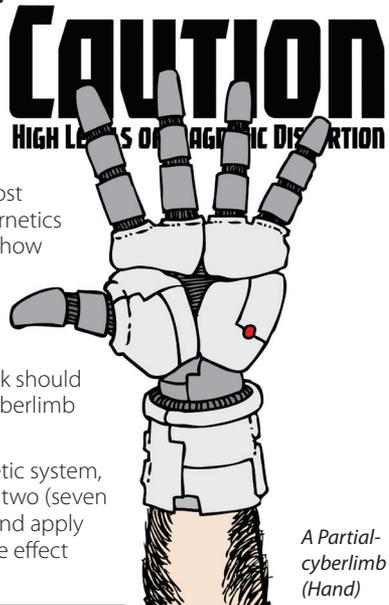
Effects of EMP on Cyborgs Chart

2d6	Effect
1-3	No Effect: The EMP does not stop the shell at all, the energy discharge grounding out immediately.
4-5	Limited Effect: The cyborg is halted for d6 combat rounds as the internal circuits for the shell sputter and ground out the discharge. During this time, the cyborg is cut off from all sensory inputs and cannot act. During the final combat round of this "freeze" the cyborg regains either mobility (1-3 on d6) or their sensory input (4+ on d6). Even if mobility is regained, the character may only take a single minor action.
6	Moderate Effect: The cyborg's shell ceases functioning for approximately 1 minute, or more precisely 7+d6 combat rounds (between 48 and 78 seconds). Make the roll, and on the combat round following this result (i.e. the third combat round if the d6 result is a 3) and on the final combat round of the "freeze" (the roll plus 7) the character regains either mobility (1-3 on d6) or their sensory input (4+ on d6). Each instance is a separate check (so mobility might be regained on the third combat round after the EMP and senses on the tenth or vice versa or both could be the same). In the case of the 'first' of these, the character may only take a single minor action and then the shell ceases functioning again until the next check.

Other Cybernetics and EMP

When an EMP goes off in the vicinity of someone with cybernetics, problems will occur. **Hardening** helps, but "modern" (30th Century) EMP is designed to circumvent hardening wherever possible. *Semi-Hardened* technology, a category where most cybernetics happen to fall into, forces cybernetics to make a check on the above chart to see how long they are disabled, while *Hardened* technology (including cybernetic organs) are treated to "Limited Effect" result on a d6 roll of 6 only (rolling 1-5 indicates a passing or negligible effect). The effects of the check should be easily extrapolated from the above (a cyberlimb frozen for d6 rounds et al).

If the character has more than one cybernetic system, make just one (a handful of cybernetics) or two (seven or more cybernetics) of the above checks and apply them at the Referee's discretion or make the effect strike a randomized implant.



A Partial-cyberlimb (Hand)

STANDARD CYBORGS (ROBOTIC BODIES)

The “body” of the cyborg is a standard drone (purchased separately from the LSU) whose computer control is removed and replaced by a housing for the LSU. It can be humanoid or any other form as desired. “Standard” audio and visual pickups include not only standard wavelengths, but low-light vision, optical zoom, low and high frequencies, enhanced hearing range (x3), sensory protection for both sense as well as full recording functions (see cybernetic enhancements, page 21-23). Battery life is provided for each shell. Cyborgs with separate movement systems (wheels, grav) will have separate batteries to provide for those functions that may need to be recharged more/less often. The following are merely a representative sample of the possible robotic frames used for cyborgs

Basic Cyborg Shell, TL 13

While robotic-style cyborgs can be built at lower tech levels, TL 13 is the first time that the LSU can fit into a human-sized and shaped shell. A similar model is produced for a TL 14 “hatbox”-type LSU that is simply smaller/trimmer in appearance (and can *still* contain more gadgetry). A basic shell has most sensory systems, including smell, taste, audio and vision as well as limited touch (only specific points in the basic shell have tactile sensation). It is bipedal and obviously robotic.

Characteristics: *Armor:* 5, *Hull:* 4, *Structure:* 3, *Strength:* 12 (+2), *Dexterity* 10 (+1)

Movement: *Speed (running):* 45 kph at full-sprint over suitable surfaces. From a dead stop (i.e. most combat movement), the basic shell can move 12 meters with a minor action.

Batteries: Standard cyborg batteries need to be recharged after 8 hours of intense activity, 24 hours of normal activity, or 48 hours of minimal activity. Recharging requires 2 hours on a standard industrial socket (it would take 6 hours from a conventional household socket for a full charge).

Incorporated Components: Full senses for vision, audio, smell, taste and limited tactile sensation. Basic shells also come with squawk boxes, short range comm-links (5 km) as standard and all hookups for the IT/ISP and Neural-plugs.

Cost: 40,000 Cr.

“Lobster” Shell, TL 12

The TL 12 cyborg Shell, affectionately referred to as the “Lobster” is something of a monstrosity. While it is human in general shape, Lobsters are much larger than humans to accommodate the larger TL 12 LSU in the low-slung “carriage” section. Locomotion is provided either with tracks/wheels or grav (the differences being primarily in cost) as this keeps the weight closer to the ground (more stable).

Characteristics: *Armor:* 6, *Hull:* 4, *Structure:* 4, *Strength:* 16 (+3), *Dexterity* 5 (-1)

Movement: *Speed (Wheeled):* 60 kph (on roads), 30 kph (offroad), with 8 hour range. From a dead stop (i.e. most combat movement), wheeled shells can move 10 meters with a minor action, tracked can move 6 meters with a minor action. *Speed (Grav):* 120 kph with 3 hour range in “full flight mode” or 9 hours in “hover” mode (approximately the same speed as normal human movement, or 9 meters with a minor action).

Batteries: The sizable Lobster batteries need to be recharged after 6 hours of intense activity, 18 hours of normal activity, or 36 hours of minimal activity. Recharging requires 4 hours on a standard industrial socket (it would take 12 hours from a conventional household socket for a full charge).

Incorporated Components: Full senses for audio, vision, smell, but these shells usually lack tactile and taste sensors (although these can be added in separately for 1,000 Cr each), Lobster shells also come with squawk boxes, short range comm-links (5 km) as standard and all hookups for the IT/ISP and Neural-plugs.

Cost: 45,000 Cr. (Wheeled/Tracked), 60,000 Cr. (Grav)

Combat Cyborg Shell, TL 13

The combat shell uses the basic cyborg shell (incorporating all features therein), and adds extra armor and mass to provide protection. It also uses a more calibrated and slightly more powerful pseudo-musculature (higher Strength and Dexterity). Both arms incorporate weapon suite technology and have extended blades (as the cybernetic enhancements). The legs incorporate both “skids” and “swiftshod” enhancements. Additionally, the bottoms of the foot and palm of the hand both incorporate mag-grapplers, and while these are insufficient in 1-G to hold up the body (they can in 0.3 G and below) they are useful in microgravity to maneuver (such as on the exterior of a ship).

Characteristics: *Armor:* 12, *Hull:* 4, *Structure:* 4, *Strength:* 15 (+3), *Dexterity* 12 (+2)

Techbook: Chrome

Movement: *Speed (running):* 45 kph at full-sprint over suitable surfaces, 75 kph with skids (2 hours of charge). From a dead stop (i.e. most combat movement), the Combat shell can move 12 meters with a minor action without employing their Skids, or 15 meters with a minor action with skids active.

Batteries: Combat cyborg batteries need to be recharged after 9 hours of intense activity, 27 hours of normal activity, or 54 hours of minimal activity. Recharging requires 5 hours on a standard industrial socket (it would take 15 hours from a conventional household socket for a full charge).

Incorporated Components: Full senses for vision, audio, smell, taste and limited tactile sensation. Combat shells also come with squawk boxes, continental-range comm-links (500km range and encrypted, with a -4 DM on efforts to jam/hack into the system), weapon suites, extended blades (arms), and skids, swiftshod (legs), mag-grapplers on both feet and hands. All hookups for the IT/ISP and Neural-plugs.

Cost: 750,000 Cr, a 2 Mcr model has Strength 20 (+4), Dexterity 10 (+2), Armor 16 and is the size of the "Lobster" but is otherwise identical.

Prince/Princess Cyborg Shell, TL 14

While the technology to re-connect the disconnected brain back into the body reliably is still elusive in the **Twilight Sector Setting**, there has been a recent innovation in life-like robotic shells, only available to TL 14 and TL 15 cyborgs (due to size considerations). Using organic components, the Prince/Princess shell is a kind of manufactured living shell. Due to size-requirements, the LSU is still located in the chest cavity and is considered "durable" (using organic backups), and much of the "deep interior" is metal/cybernetic, but for all intents and purposes, this shell provides the cyborg with life-like full senses (actually enhanced senses, even taste and smell and touch are more acute than normal, providing a +1 to all *Notice* checks and to sense-based *Recon* Checks). Because these shells can be made in literally any morphology, and with any visage, they are often made as humans with beautiful faces and tall, exceptionally fit bodies. In fact, this is where the name "Prince/Princess" comes from, since they look like storybook royalty. This however does not mean that the shell could not be made as a (very large) dog/wolf, dolphin or other form. Often a flap is found near the neck/base of skull where plugs can be inserted, although the Neural links can also run wirelessly and the shell has induction plates built into both hands. Currently, these shells are being made in only small manufacturing runs — if

not individually — as batch-work in specialized clinics, and obviously these shells are only coming out of High Tech worlds.

Characteristics: Strength: 12 (+2), Dexterity: 12 (+2) and **Either** *Armor: 5, Hull: 3, Structure: 3*, **or** Endurance 10 (+1). This is because of the variations in design and manufacturing, some of these shells come out more organic than mechanical, and some come out more mechanical than organic. If the character has an Endurance stat, they can be considered to have both Skeletal Replacement and Level II Toughskin. If the Character is more mechanical than organic, use the *Armor/Hull/Structure* values shown.

Movement: *Speed (running):* 45 kph at full-sprint over suitable surfaces. From a dead stop (i.e. most combat movement), the Prince/Princess shell can move 12 meters with a minor action.

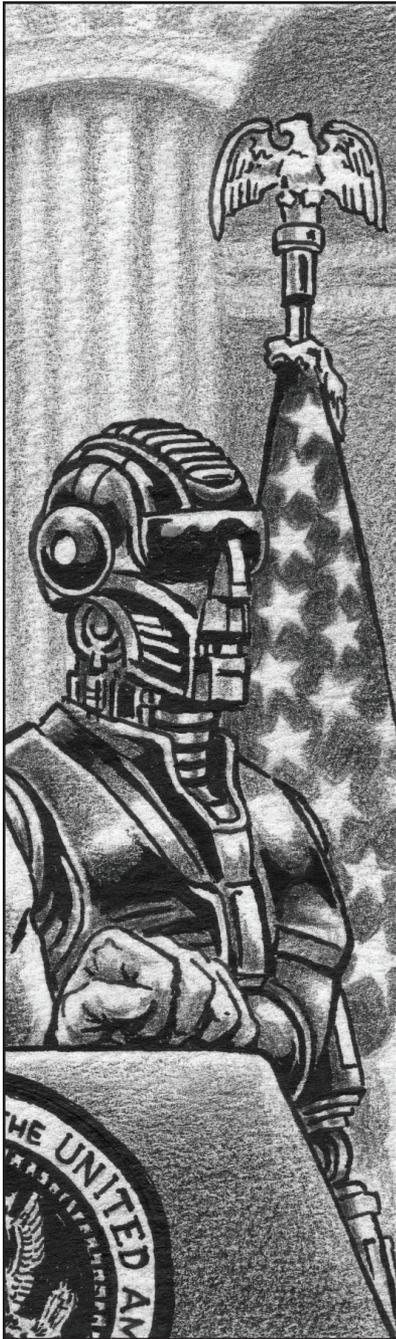
Batteries: Prince/Princess batteries need to be recharged after 12 hours of intense activity, 36 hours of normal activity, or 72 hours of minimal activity. Recharging requires only 2 hours on a standard industrial socket (it would take 6 hours from a conventional household socket for a full charge). In addition, the living portions of the robot require sustenance as well (for “*Armor/Hull/Structure*” types this comes from additional glucose-plus requirements, for “*Endurance*” types, this requires actual food intake, 25% normal).

Incorporated Components: Improved reception in all five natural senses, +1 DM to *Notice* and sense-based *Recon* checks. Squawk box, Medium- range encrypted comm-links (500km range, with a -4 DM on efforts to jam/hack into the system). All hookups for the IT/ISP and Neural-plugs (with induction plates in both hands). Depending on design (see characteristics above), Skeletal Replacement & Toughskin may also be added. Other sub-systems can be integrated at additional cost as normal implants.

Cost: 12 Mcr (base) Often cyborgs pay more depending on the world where they are found and whether there is one available at all. As these shells become more “production-model” oriented, they will eventually drop in price to around 6 Mcr.

Breaking in a New Shell

When the cyborg is breaking in a new shell, they will have ½ Dexterity for the first d3 hours (until their neural map learns the kinesthetics of the new shell). Shells with unusual equipment (including weapons), will be -2 DM for the same period. The cyborg can eliminate the penalty (operate with full Dexterity or remove the -2 DM) if they concentrate fully (i.e. take only a single minor action per combat round).



ADDITIONAL DEVICES

The above shells are “basic” models. Cyborgs can build in additional devices to their shells, internally as well as externally. While not an exhaustive list, some common examples include:

External Devices: The same sort of equipment that is found in the description of a gear mount (see Page 33): additional sensors, lighting equipment (lightbars, flashlights), tools or other handheld devices (cleaning equipment, cooking gear), holographic emitters, and even weapons (although having them strapped on you doesn’t mean you can fire them all at the same time).

Internal Devices: The LSU takes up the size determined by the tech level in the main cavity of the cyborg shell and the limbs, batteries and so forth for movement take further space; however, there is usually some space leftover inside the shell for small devices. Locator beacons, comm-links (beyond the comm-links that come as standard), squawk boxes, additional computers, extendable blades, cached weaponry (aka “pop-holsters”), internal cargo spaces (sometimes heated/cooled or simply air-tight/sealed). Cyborgs can also mount enhancements for Sub-Torso Replacements (See Pages 39-41). The Genital Sweet is an especially popular modification, demonstrating once again cyborgs are people (yes, with all their baser urges intact).

CYBORGS IN COMBAT

Use the rules for robots to determine the amount of damage they can sustain and the like (except the Prince/Princess Shell with Endurance stats, there use normal damage for humans).

To determine the effects of an attack on a cyborg, first determine damage as normal, then inflict a number of hits using the following chart. Note that

all shells have one or more points of armor that reduces the overall damage, (so a 3d6 attack that inflicts 2+4+4=10 points of damage on a basic cyborg shell with Armor 3, is treated as 7 points on the chart below, a "Double Hit").

These hits are then applied to particular locations on the vehicle. Double or Triple hits count

as two or three hits *on the same location*. Damage is rolled first on the Surface column of the chart, then (when Hull is reduced to 0) the damage passes through to the Internal column.

Cyborg Damage Table

Damage	Effect
0 or less	No damage
1–3	Single Hit
4–6	Two Single Hits
7–9	Double Hit
10–12	Three Single Hits
13–15	Two Single Hits, Double Hit
16–18	Two Double Hits
19–21	Triple Hit
22–24	Triple Hit, Single Hit
25–27	Triple Hit, Double Hit
28–30	Triple Hit, Double Hit, Single Hit
31–33	Two Triple Hits

For every extra three points: add a +1 Single Hit

For every extra six points: add a +1 Double Hit

Robotic Shells and Hand-to-Hand Combat

The amount of damage done by a robot in hand-to-hand "unarmed" combat is based on their Hull characteristic (add the Strength DM as normal to strikes). Robots can also grapple with human-sized targets and can choose to do damage if they win (based on chart). At a Hull of 5+, the robot only requires one limb to grapple human sized opponents, as in they have scooped their target up in one hand/manipulator),

HTH Cyborg Damage Chart

Cyborg Hull:	Damage Adjustment	
	Strike:	Grapple:
1	d3	-2+Effect
2	d6	2+ Effect
3	d6+4	4+Effect
4	2d6+3	6+Effect
5	3d6+2	8+Effect
6	3d6+6	10+Effect

Modified Internal Hit Chart, Standard Cyborg

Roll	Surface	Internal
2	Sensors	Life Support Unit
3	Hull	Structure
4	Ext. Device or Limb/Upper	Batteries
5	Limb/Upper	Joint
6	Armor	Internal Device
7	Hull	Structure
8	External Device	Internal Device
9	Limb/Lower	Batteries
10	Ext. Device or Limb/Lower	Drive
11	Hull	Sensors
12	Sensors	Life Support Unit

Hull: Reduce the cyborg's Hull (1 point). When Hull is reduced to 0, further damage goes to the Internal column of the chart and any Hull hits are treated as "structure" hits.

Structure: Reduce cyborg's Structure (1 point). If Structure has been reduced to 0, the cyborg body is rendered an inoperable heap. If the value becomes negative, the LSU takes damage as it is reduced to a burning, smoldering heap. At some point the robotic shell just explodes, the strength of the explosion depends on how much battery life remains in the unit.

Armor: Reduce the cyborg's armor by one per hit. If they have no remaining armor value, damage internal components, if they have no internal components left, treat as a Hull or Structure hit (as appropriate).

Batteries: Cyborgs are powered by superconducting batteries.

- ⚡ *First Hit:* The vehicle or drone loses one round's worth of actions due to power fluctuations.
- ⚡ *Second Hit:* The vehicle or drone's movement is reduced by 50%.
- ⚡ *Third Hit:* The power plant is destroyed, disabling the shell and inflicting 1d6 Hull/Structure hits on it as the energy inside of the battery is released in a small explosion.

Further hits to this after the batteries are destroyed are treated as nothing (bullet/beam/whatever passes through this space).

Drive: The cyborgs movement capabilities have become compromised. This does not affect their limb movements.

- ⚡ *First Hit:* Reduce movement by 10% and apply a -1 DM to all skill checks involving (drive) movement.

- ⚡ *Second Hit:* Reduce movement by 25% and apply a –2 DM to all skill checks involving (drive) movement.
- ⚡ *Third Hit:* Drive disabled. The cyborg can — if their primary movement is bipedal — stagger at 3m per minor action. Doing so forces the cyborg to make an average *Athletics (Coordination)* skill check (failure indicates falling down).

Further drive hits count as Hull/Structure hits.

External Device: Many cyborgs place devices on the outside of their bodies (see “Additional Devices”, pg. 112). Choose one of these external devices randomly for each hit (if one is found on the cyborg). If the device is flimsy, it is simply destroyed at Referee’s discretion (in fact, some cyborgs festooned with such devices often get many different “flash” pieces blown off, external devices are not armor). If the external device is protected somehow (tough housing for example), use the hits below. If there is no external device, treat this result as a Limb (if listed as “**Ext. Device or Limb**” result) or a Hull/Structure hit.

- ⚡ *First Hit:* The weapon or device suffers a –2 DM to all checks related to its operation.
- ⚡ *Second Hit:* The weapon or device is destroyed.

Internal Device: Cyborgs often incorporate a range of internal devices, squawk boxes and comm-links come as standard, but many times individual cyborgs will build in other devices as well (see the “Additional Devices” section, above). If there is no internal device, treat this result as a Hull/Structure hit.

- ⚡ *First Hit:* The weapon or device suffers a –2 DM to all checks related to its operation.
- ⚡ *Second Hit:* The weapon or device is destroyed.

Joint: Choose a limb randomly, the internal joint for that limb is rent. Thanks to Murphy’s Law, 50% of subsequent “Joint” results hit this limb rather than one of the other undamaged limbs.

- ⚡ *First Hit:* The limb is left swinging free, and is effectively useless. The actual limb however is not damaged, and a field repair (taking 10+d6 combat rounds and at least one other functional limb or 5+d3 combat rounds with two functional limbs or external assistance) can restore the limb to utility (it still counts as having had one hit).
- ⚡ *Second Hit:* The limb is removed entirely as the joint gives way. The limb itself is mostly intact for later salvage.

Further hits to this specific limb are treated as nothing (bullet/beam/whatever passes through this space).

Techbook: Chrome

Limb (Upper/Lower): Choose a limb randomly for each limb hit. Thanks to Murphy's Law, 50% of subsequent "limb" results hit this limb rather than one of the other undamaged limbs.

- ⚡ *First Hit:* The limb suffers a -2 DM to all checks related to its operation. If the hits were taken to the legs (and this was their primary form of movement), this applies to movement as well, reducing movement by 20%.
- ⚡ *Second Hit:* The limb is destroyed. If the limb involved is a leg, the character will likely fall down unless they are leaning or holding onto something already.

Further hits to this after the limb are destroyed are treated as nothing (bullet/beam/whatever passes through this space).

Life Support Unit Damage: The LSU takes damage, either from direct means or through a feedback that manages to bypass the protective systems. Two hits will destroy a non-durable LSU, three a durable one.

First Hit: The cyborg's Life Support Unit is damaged.

- ⚡ If the unit is *not* a "durable" model this indicates a fatal shot for the cyborg unless help arrives quickly (within d3 hours), make a roll on the Serious Damage Effects, Life Support Unit chart.
- ⚡ If the unit *is* a "durable" model, it is able to continue functioning (maybe), make two rolls on the serious damage chart and take the *best result (cyborg's choice)*.

Second Hit: The Life Support Unit has taken critical damage:

- ⚡ If the unit is *not* a durable model, the cyborg's life support unit is destroyed. The cyborg is dead.
- ⚡ If the unit is a durable model, the cyborg's life support unit will hang in for another d2 hours before failing. Also, make *another* roll on the Serious Damage Effects table (in addition to the one from the first hit). A durable LSU will be utterly destroyed with a third hit.

Sensors: The cyborg's sensors ("eyes"/"ears" minimally) have be damaged. When the damage is taken on the Internal chart, this is often the connectors between the sensors and the LSU that have become overridden (i.e. the sensors themselves may not require the repair).

- ⚡ *First Hit:* The cyborg suffers a -2 DM to all Sense checks (*Notice* or sense-based *Recon* checks).
- ⚡ *Second Hit:* The sensors are destroyed, "blinding" the vehicle or drone.

Further Sensor hits count as Hull/Structure hits.

Serious Damage Effects, Life Support Unit

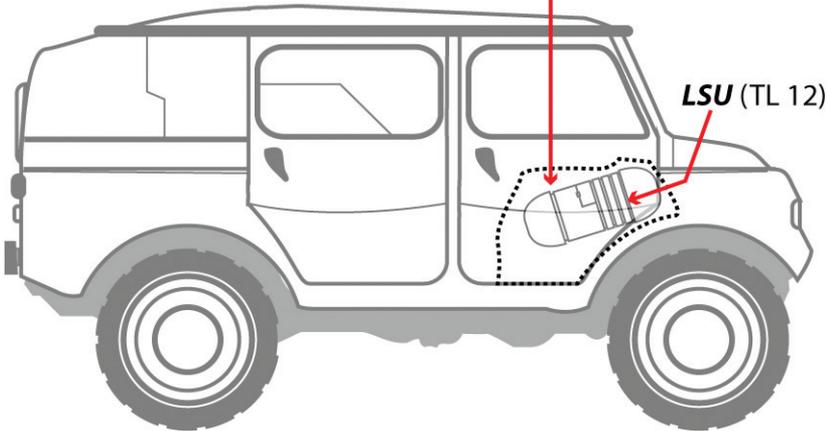
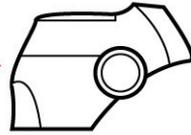
2d6	Effect
2-4	Death Sentence: The LSU fails, which will cause the cyborg to die within 6+d6 minutes (meaning that it will die before the brain can be extracted in all likelihood, thus the title). After the first 10 rounds post-failure, oxygen deprivation begins to set in, and the cyborg is at -2 DM for all actions. After 15 rounds, the cyborg is at -4 DM, by 20 rounds, they are at -6 DM and sometime after that fall into unconsciousness. Death sets in after 4 to 5 minutes (40 to 50 combat rounds).
5-6	Debilitating Seizures: Immediate unconsciousness (long term, see below). If the character is not given medical attention within d6 hours, they will die as above. The brain has undergone a series of massive seizures from the life support unit damage that causes the <i>permanent</i> loss of d3 Intelligence or d3 Education. The character will also be out of commission for <i>at least</i> d6 weeks in a comatose state that requires constant medical monitoring. The Life Support Unit is heavily damaged, requiring a major overhaul (25% of original cost to repair) before it can be of any further use.
7-9	Seizures: The brain undergoes a seizure that causes loss of consciousness for d6 hours. This also causes d6 Int and d6 Edu damage <i>temporarily</i> , regained as per normal under medical care (if reduced to 0 the subject is in a coma). Until the Life Support unit can be repaired, the character is at -4 DM to all actions and is either in constant pain or suffers from short to medium-term memory losses (some of which never restores).
10-11	Brain-Burn: The brain is hit with mini-seizures, d3 damage to Int (standard wound loss, not permanent loss, see TMB pg 75). Until the Life Support unit can be repaired, the character is at -4 DM to all actions and is in constant pain.
12+	Zapped: The brain is hit with a discharge that causes a -6 DM to any actions this round, diminishing to a -4 DM in the next round as the system resets itself and nothing after that.

REPAIRS

Use the rules in the Traveller Main Rulebook, page 68 for most robotic shells. The Prince/Princess Shell must be repaired by a biotechnician (instead of a medical professional) long term, although *Medic* skill can be used for first aid (to stem bleeding and restore some utility to the shell in the immediate aftermath of a wound).

Cyborg Tested, Cyborg Approved.

'Passenger side' Cyborg Cowl
(added protection & C-in-C)



The 2990 Model Elmada Lux (or Luxury), which has been modified for cyborg control.

NON-STANDARD CYBORGS (VEHICLE BODIES)

Cyborgs can be integrated into vehicles as well as robots. While considered non-standard in the 30th century, this was the only means of hooking up the LSU of earlier models of cyborg (TL 10 & 11). Some cyborgs even use facilities (bases, micro-gee workshacks etc.) as their "shell". The interface accoutrement that allows this costs +20% of the (weaponless) vehicle costs (minimum 4000 Cr), giving the cyborg unprecedented control over their vehicle/facility. If the "vehicle" is exceptionally large, the Referee can adjust the percentage down, or they can use only a portion of the full value. For example, for starships, simply use the cost of the bare hull (which will still entail a significant outlay of credits) rather than the hull plus drives and power plant and additional components. This can be done as a retrofit.

For this 20% increase in costs, the cyborg not only gains all piloting/driving/sailing functions, but also gains controls over access points, windows/portals/what-have-you and amenities. This means that robotic armatures can open and close doors and the temperature and (in sealed and pressurized vehicles) atmosphere is under the direction of the cyborg. Welcome to my parlor indeed, little Fly.

Driving/Piloting the Cyborg Vehicle

Because the cyborg has essentially wired themselves into the vehicle, the vehicle has become an extension of their body. This means that they have a special awareness of it and finesse that is lacked by “mere” drivers. In fact, part of the cost adjustment for wiring the cyborg into a vehicle is spent in planting sensors around the vehicle that allows the cyborg to “see” in all directions (generally not seeing all around at once, but there are very few “blind spots” on one of these vehicles unless it has already taken some damage). In game terms, apply a +2 DM to all maneuvers made with the vehicle. This is “free” (it comes when the control interface is linked to the vehicle, part of the costs involved) but does not “stack” with most other performance-enhancement bonuses (i.e. use the higher, not the sum). The Referee has final determination as usual.

Any weapons mounted to the vehicle are handled separately, although they can be given the advantages of a weapon suite (reducing 2 DM worth of penalties **or** adding a +1 DM to hit) for 10% of the cost of the weapon (minimum 1,000 Cr).

Non-Standard Cyborgs in Combat:

Life support units are, if anything, even better protected from harm inside of vehicle chassis. This is reflected in the fact that some vehicles have a cockpit *and* space for the Life Support Unit (thus the LSU is only hit on an internal roll of 12 on the internal column of the chart, note that this affects *both* the cockpit and the LSU); while others replace the cockpit with the LSU, which is common for bigger LSUs in tighter cockpits (and thus the LSU can be hit on a 11 or 12 roll on the internal column of the chart). LSU’s can even survive when the vehicle is destroyed (Structure negative) although a vehicle explosion will cause an LSU hit and utter destruction is a matter left to the Referee to adjudicate.

Otherwise, the combat is the same as vehicular combat in the *Traveller Main Rulebook*. The results of the chart are the same as that found in the TMB, pages 67-68, with the exception of the LSU hit, which is the same as that in the robotic cyborgs in combat section (page 116).

Modified Internal Hit Chart, Non-Standard Cyborg

Roll	External	Internal
2	Hull	Structure
3	Sensors	Power Plant
4	Drive	Power Plant
5	Weapon	Cargo
6	Hull	Structure
7	Armor	Passengers
8	Hull	Structure
9	Weapon	Cargo
10	Drive	Computers
11	Sensors	Cockpit or LSU
12	Hull	Cockpit & LSU

Changing Shells/Frame Chart

TL	Time (min)	"Tight" Fit	LSU Size (approximates)
10	60	A luxury-sized vehicle	0.7 m x 0.7 m x 2m (½ dton)
11	50	A sedan sized vehicle	0.7 m x 0.7 m x 1 m (¼ dton)
12	40	A Subcompact Vehicle	0.3 m x 0.75m cylinder
13	30	A large man-sized robot	0.3 m x 0.47 m cylinder
14	20	A small man-sized robot	0.22 m x 0.33 m cylinder
15	10	A dog-sized robot	0.20m x 0.30 m cylinder

CHANGING SHELLS/FRAMES

Cyborgs are designed to change shells, but sometimes there is a question as to how long getting in or out of a shell might take. This is largely dependent on the LSU and the type of shell one is moving from or to. Note, that while a cyborg can take actions on their own up to a point in this task (about half of the time involved with "freeing" the LSU, or 25% the listed time below), they will require assistance for the other half (since their limbs will be disconnected from their control during the process).

- ⚡ If attempting merely to free the LSU (i.e. not install it elsewhere), **halve** the time on the chart.
- ⚡ If merely trying to get to the LSU exposed enough for repair or to save the cyborg's brain after certain kinds of seizures, **quarter** the time, the LSU is still seated inside of the shell but there is enough exposed to allow repairs and emergency measures (an equal time can be spent after any emergency efforts to free the LSU entirely from the frame). Note that a cyborg could do this much all by themselves but not much more (before losing control of shell).

Other modifiers (all optional):

- ⚡ Add 50% to the base for moving into or out of a "tight" fit (this depends on tech level as well), so +100% for moving from one tight fit to another.
- ⚡ Reduce base time by 50% if the fit between the brain box and the housing for it is especially loose, this is best left to Referee discretion. A vehicular mount for example, where the brain is in the dashboard might be "tight" while a vehicular mount where the brain box is stored in a space that is three times the size (or more) of the LSU might be considered "loose".
- ⚡ Reduce the base time by 25% if the technician is armed with the proper tools. **Note:** minimal tools are *required*, this refers to tools that are specific to this kind of task (and they are generally not found in the average tool kit)

Roleplaying a Cyborg

For players who want to run a cyborg character, the following items should be kept in mind:

Brain Chemistry: One of the things that drive human beings isn't simply the physical brain, but also the subtle chemistry of the brain. There are a lot of subsystems involved in the process, some in the brain itself, others in the body. One of the reasons that the functional LSU does not occur until well after the advent of other forms of cybernetics is that the artificial neurochemistry had to be able to match the body's own natural chemistry.

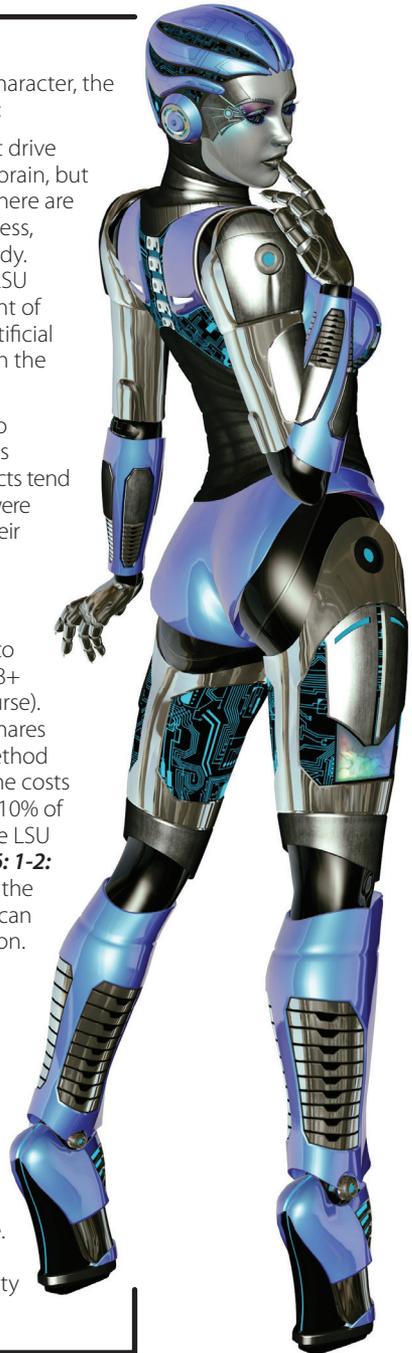
Thus, despite expectations, cyborgs are no less emotional than other humans. Studies demonstrate that if anything, some subjects tend to be slightly *more* emotional than they were before their brains were removed from their former bodies and placed into the LSU.

becoming a Cyborg during CharGen:

Any time the character rolls an injury during character creation, they can opt to become a cyborg instead if they roll an 8+ on 2d6 (with Referee's permission of course). The character can convert any of their Shares (if using the Twilight Sector CharGen method in **Tinker, Psion, Spacer, Spy**) to offset the costs of the cyborg's LSU. Each Share pays for 10% of the costs of the LSU. The tech level of the LSU should be determined randomly (**roll d6: 1-2: TL 12, 3-5: TL 13 and 6: TL 14**), although if the character wants a **lower** tech level, they can simply choose to take the lesser TL version. Most cyborgs will pilgrimage to a high tech world as soon as they are able.

Skills & Stats: All Skills are derived normally, as are Intelligence and Education characteristics. Social Standing is modified as follows...

Social Impact: A cyborg receives -2 Social Standing (the raw score, not the DM). If the cyborging resulted from choice rather than accident or injury (i.e. a character with a perfectly good body **decided** to become a cyborg) this penalty increases to a -4 to those aware.



CYRGEWARE

A new (TL 14) type of cybernetic has emerged from the Oster Republic where it has been in use for some three decades. Only after some rather flagrant industrial espionage have the techniques for making this kind of cybernetic spread to the Terran Union, and from there to that nations' former allies in the Mutant War.

Simply put, cyrgeware allows the user to (slowly) alter their physical form for maximum potential. (See: the Nitty gritty for more detail). Someone who uses cyrgeware is called a *cyrger*. These changes take place by tasking or re-tasking neo-organic memory plastic compounds (NOMP Compounds) already in the body over several hours, during which the user is (mercifully) unconscious. While the alterations are not immediate (unlike some of the fiction used in Vids as the news about this cybernetic development became public), they are very useful nonetheless. Cyrgeware needs to be interfaced with an imbedded "T-Coil" computer system (a TL 14 system designed for biological synergy, see Page 76) that provides the several benefits. Common sub-applications for cyrgeware are as follows:

- ⚡ **Adding or "threading" new and more efficient muscle fibers** through the existing musculature or adding new musculature: this enhances both Strength and Endurance. Use the Muscle Threading chart (right) to determine the level of benefit for X Active Points.
- ⚡ **"Latticing" Neural pathways to improve CNS response**, known as "Jacking" (this adds Dexterity, but less efficiently than Strength and Endurance)
- ⚡ **Controlling or reducing physical demands**, the need to sleep and other autonomic or semi-autonomic functions. This is gained by way of the control over brain components allowed by the T-Coil.
- ⚡ **Gland control**, the T-Coil allows for adrenal pumping and other effects, providing the subject with "surges" (where the original version of this system got its name) of strength and speed. These approximate the effects of various combat drugs. (see TMB Pg 94)
- ⚡ **Adding new flexible appendages** (such as tails or wings) By shifting the NOMP compounds externally.
- ⚡ **Creating an exoskeleton** or with crystallized NOMP.

Muscle Threading

Active

Points:	Str:	End:
1	+1	+0
2	+1	+1
3	+2	+1
4	+2	+2
5	+3	+2
6	+3	+3



Part of the public relations program in the Terran Union, designed to attract the attention of high-profile investors, as well as the stodgy notables of the Military Industrial Complex.

The Nitty Gritty (for the curious)

Cyrgeware (pronounced “surge ware” SERJ-wair) combines several different technologies to expand human capabilities beyond mere cybernetic augmentation. Specifically, these are: **Nanites** in solution, **Neo-Organic Memory Plastics** (also known as NOMP compounds) and a **T-Coil** internal computer system.

The nanites in solution are the control for the entire system, as well as providing critical cross-connection duties. The nanites come in three basic varieties (and many sub-varieties which are too technical to go into here):

- ⌘ the **builders** are designed to re-task the NOMP-Compounds, in which they have been laced
- ⌘ the **routers** forge and reforge connections between the NOMP-compounds and the existing nervous system
- ⌘ the **programmers**, deliver the messages to the various systems throughout the body, helping the other two types as necessary.

Techbook: Chrome

The nanites flow through the *channels*, which have been grafted to the body during the initial installation of the cyrgeware. Some of the channels are found quite close to the skin and give the surface of the skin the “digitized” look that can mark a telltale cyrger. Nanites, despite popular mythology, do not last forever, especially inside of the body. Each time a change is desired, a new batch of nanites must be placed into the T-Coil. These do not have to be pre-programmed, and are not even tissue-typed specifically for the user, but they do have to be replenished for each change. Enough of the different component nanites (routers, builders and programmers) to force a change can be pre-loaded into the T-Coil in between changes, but after these are used to initiate a change, any more must be kept separately (the “loads” are about the size of a C battery, 50 mm length/26.2 mm diameter). Each “load” costs approximately 5,000 Cr.

The NOMP-Compounds are neo-organic memory plastics, which have been inserted into the body and form the various tissues, bones, muscles and other component parts of the system. Like any memory plastic, they can take a variety of different shapes. Unlike most memory plastics, they have also been tailored to the DNA of the cyrger to prevent system rejection and other immune system problems. The NOMP-Compounds are not magic, they can move, sometimes quite fast through the system using the channels, but they are not capable of instant transformation. The fastest they can make changes is when they are used to cut down on bleeding, which is a significant help to wounded cyrgers but is not the instant transformation or healing one sees in entertainment/action viddies. Cyrgeware can however make significant changes over a period of several hours, depending on what needs to be created.

During this time, the T-Coil usually places the cyrger into a catatonic state to dull the pain. Cyrgers often awake from this state feeling very worn and “achey”, which lasts for up to an hour but does not seriously degrade their performance (although it does nothing to improve their moods).

Note that NOMP-Compounds add weight to the character: up to 35kg or more in some cases. Even when not in use, some cyrgers grow tails or other flexible appendages rather than redistribute them around the body (which tends to make them look “puffy”). Like nanites, the NOMP compound has to be replenished periodically, unlike nanites, the compound is not used up in every transformation. Generally speaking, the NOMP is measured and replenished for a nominal fee (100-600 Cr) with every maintenance check cycle.

The T-Coil internal Computer, the central component of the system, is generally housed in some part of the cyrger where cybernetic alterations have created more space within the body cavity. The T-Coil Computer works somewhat like the T-Spheres used on major computer systems; although it is smaller (the ‘coil’ shape – actually a circllet – comes from the optimal minimum size and shape of the processor itself). The T-Coil is also encased in solid (but clear) material, and there have been cases where a cyrger has been burnt to a crisp but left behind their T-Coil in the ashes. The T-Coil is what allows the cyrger to control their autonomic functions. Thus far no cyrgeware T-Coils have been “hacked” (where someone other than the cyrger takes control) but this remains a possibility and a morbid fear of cyrgers and designers.

Cyrgeware in Game Terms

Each level of cyrgeware provides a number of "Active points" that are used for Muscle Threading (adding to Strength and Endurance on an alternating basis) and Latticing (adding to Dexterity at a 2:1 ratio) as well as "morphs." Each Level also affects the number of possible morphs that can be utilized by the system, aka the "Morph Suite" (see Page 127). Additionally, various levels are able to produce more complex "surges" of hormones (which duplicate the effects of some medicinals) and provide an effective IT rating (the amount of computing power left over *after* the T-Coil's primary function).

- ⚡ **Baseline Cyrgeware (TL 14)** 3 Active points and a "Morph Suite" of 4. A Baseline Surge can also produce the effects of a Stim (with the same penalties for multiple use) up to once every four hours and the Combat Drug once/day (Traveller Main Book, pg. 94). Effective IT: Computer/3
Cost: 6 Mcr
- ⚡ **Improved Cyrgeware (TL 14)** 5 Active points and a "Morph Suite" of 8. In addition to duplicating the same drug-like effects as Baseline cyrgeware, an Improved system can **also** act as a dose of metabolic accelerator (once per day, which precludes the duplication of Combat Drug effect for that day). Effective IT: Computer/5
Cost: 9 Mcr
- ⚡ **Advanced Cyrgeware (TL 15)** 7 Active points and a "Morph Suite" of 10. It allows Stim effects on demand (although the same penalty still holds true for multiple use) as well as Combat drug or metabolic accelerator drug effects up to 3 times a day (these must be spaced a minimum of 6 hours apart). Effective IT: Computer/6
Cost: 12 Mcr

In most cases, cyrgeware of whatever rating requires d3+5 hours to shift the points around unless there is only a small amount of changes that are being made (1 point for simple or Improved systems, 2 for Advanced systems) in which case the time required is halved.

CYRGEWARE CHARACTERISTICS

The T-Coil computer system cyrgeware provides the cyrger with the following advantages:

- ⚡ **Integrated 3-Point Neural Plugs:** At minimum, cyrgers need 3-point neural plugs, although most cyrgers will instead opt for the 5-point version instead (costing an additional 35,000 Cr, which is a drop in the bucket when compared to the overall cost of the cyrgeware).

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- /// **Integrated IT:** The cyrger's T-Coil integrates the functions of an IT system (Effective values listed, actually the system is far more powerful, but this is the portion that can be programmed/reprogrammed for use as an IT). Most cyrgers will also integrate the other elements of the ISP (Chipped Reflexes and HUD/Audiolinks).
- /// **Autodoc Mode:** if the subject has taken a Serious wound (i.e. damage in all three physical characteristics) cyrgeware can also perform critical first aid automatically (with *Medic 1*, or *Medic 3* if the cyrger has Constriction Bands, use the cyrger's baseline End stat for the attribute DM). Autodoc mode takes d6+2 minutes after the wound is taken, but the cyrger must be relatively stationary for the mode to initiate. The *Medic* check provides the normal amount of benefit (twice the effect value of the roll)
- /// **Autonomic Control:** Going well beyond an Autonomic Switch, the cyrger gains near-complete control over autonomic functions through their T-Coil: sleep, hunger, nausea, certain fear responses, can all be overridden and simply "turned off" by conscious control. This effect also allows cyrgers to fall asleep on command, very handy for insomniacs. Autonomic Control can also create natural arousal responses on command (sometimes it's good to be a cyrger).

As a cutting edge piece of TL 14+ technology, the T-Coil System currently cannot be repaired, but must be replaced.

Dangerous Urges, or lack thereof

Shutting off the keenly designed human monitoring system is inherently dangerous. This system is after all the culmination of an evolutionary process, made tried and true over millennia by natural selection. Turning off some of these inputs also does not eliminate the "problems" these systems were designed to advertise. Thus full autonomic control is potentially dangerous just as it is useful.

Sleep for example, is necessary for the body and the mind. The cyrger can simply tell the body not to go to sleep, but after a while their muscles will start to have problems and their mind will begin to play tricks on themselves even though they do not "feel" tired. Some of the earliest Oster Exemplars who had Crygware installed demonstrated the problems of sleep deprivation when they began to turn psychotic after a few full days with no rest on combat duty.

We feel pain because we have suffered damage to the system; we feel hunger/deprivation when the body is out of fuel and so on. Likewise, turning off hunger does not provide the body with nourishment, and can lead to serious loss of strength as the body begins to cannibalize muscle tissue for energy once the fat is all gone. Thus far there are no records of a cyrger starving himself to death because they have shut down this mechanism (outside of some poor souls trapped with no food for long periods).

MORPHS

The significant body-alterations, analogous to accessories, available to cyrger are known as *morphs*. Most of these take some time to activate (a few hours), during which the character is placed into a protective comatose state due to the pain involved in shifting mass through the body.

Any morphs the character wants have to be programmed/built into the body during cyrgeware installation or later with a separate surgery. Some morphs use permanent structures grafted onto the user that are simply dormant until used. An X-ray of a character with a tail, for example, will show alterations to the coccyx and spinal column. Because the T-Coil memory system has to govern all of these shifts and changes, each morph takes an enormous amount of pre-programming. Thus there are practical limits to the number of morphs stored in the T-Coil's memory, aka the "Morph Suite": 4 points worth of possible morphs for baseline cyrgeware, 8 points for Improved and 10 Points for Advanced.

The Morph Suite of the cyrger has to be established when it is installed, although it can be altered through further surgery (use base costs below +50% extra). Each example below provides some additional capability for the cyrger, and they all have listed "costs" involved which indicate how many active points the morph draws away from their cyrgeware while in use (this cost also used to determine the "Morph Suite" with some exceptions). Each morph also has a certain amount of suggested NOMP (use to get a *general gauge* of how much NOMP must be in the system, adding to stats costs about 5 kg/active point in Str/End or 2.5 kg per added Dex).

For example, a cyrger with Baseline cyrgeware which has up to 4 points to allocated to their Morph Suite selects Popclaws (claw style, 2 points) and a cat's tail (1 point) as well as Constriction Rings (1 point). The cost of the cyrgeware is 6 Mcr (base) +200,000 Cr (Constriction rings) +200,000 Cr (Cat's Tail) + +150,000 Cr (Claws) = 6.55 Mcr total. They also should have at least 8 kg of NOMP in their system (just for their morphs), but the cyrger probably would have about 12-15 kg to account for adding those Active points to stats instead of Morphs.

Constriction rings (+200,000 Cr, 2 kg NOMP)

These are rings of memory plastic inside of the major blood vessels that can constrict if there is an injury to that area, reducing the bleeding significantly. These rings reduce every 5th point from a wound by preventing blood loss and reducing shock – if the character takes 12 points of damage from a gunshot wound for example, it would be reduced by 2 (one point is absorbed at 5 and the second at 10 points of damage, the

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excess 2 is simply lost, so the next wound suffered will only reduce damage at the 5-point and 10-point threshold again). Additionally, the Constriction rings help *Medic* checks made on the character, providing the skill user with a +2 DM on their task. While the Constriction rings are not by any means a "major" morph, it is a very intricate system that requires the T-Coil to monitor and modify blood flow in several key areas of the body in order to stave off complications.

Constriction rings use up no Active Points (although they do "cost" 1 point for determining the Morph suite, just nothing afterwards).

Exoskeleton, Full (+250,000 Cr, +3 kg/point NOMP)

While this morph is not properly an exoskeleton (since it forms just beneath the skin rather than over top of the skin), the name has stuck. This morph creates a bony exoskeleton made from layered NOMP compounds. Visibly, these new exoskeleton plates are obvious to anyone who can clearly see the cyrger's exposed skin. This (not-quite-) exoskeleton functions as armor, but unfortunately does not have the tensile strength of metal to act as particularly "good" armor. Nonetheless, the added layer of protection is relatively flexible and as a result can add to other armor the character possesses.

Exoskeletons use up 1 Active Points for each +1 they provide to the character's armor value.

Exoskeleton, Critical (+150,000 Cr, +1 kg/point NOMP)

This morph creates a lesser form of the full exoskeleton listed above, which only protects strategic (i.e. critical) areas of the body: the skull, spine, and heart. It is much more "subtle" than the Full Exoskeleton (unless they are exposing the areas covered, hair often covers much of the morphs effect on the top and sides of the skull). Critical exoskeletons give the character a 1 in 6 chance of adding the armor in any given situation (called shots to those locations of course will use the upgraded armor value).

Critical area Exoskeletons (heart, spine, neck) use up 1 Active Points per +3, to a maximum of +6.

Gills (+125,000 Cr, +0 kg NOMP)

Gill slits allow the cyrger to breathe underwater. These are just like the cybernetic adaptation of the same name. The Gill adaptation also includes various hardware that normally lies dormant and will not be detected unless someone makes a Difficult *Medical* check with the appropriate scanning equipment. When the morph is activated however, it is readily apparent on the neck and sides of the body.

Gills use up no Active Points (except they "cost" 1 for the Morph suite).

Supplementary Limb (+300,000 Cr, 15-20 kg NOMP)

This is a fully articulated limb, although usually distinctly thinner than a normal limb (Strength: 5 (-1), Dexterity is the same as the user's minus 2). The supplementary limb is less flexible than the tentacle or tail but stronger thanks to the rigidity. Note that the human brain has enough troubles coordinating the use of the limbs it has, thus any action performed by the extra limb is performed as if by the "off" hand. Otherwise, see "Secondary Limbs", page 31.

Limbs use up 3 Active Points each.

Popclaws (+200,000 Cr, +3 kg (claw), 5 kg (blade) NOMP)

These are razor sharp, very hard extensions either from the fingertips (claws) or the forearm or some other longbone area of the body (a 'blade'). Popclaws of either type are made for extremely dense weaves of the NOMP Compound, and while they do not have the same strength as metal (ounce for ounce), they are still very solid and can still cut flesh very easily, tearing through even light armor. Combat rolls made with the blade use *Melee (Blades)* while the claw uses *Melee (Natural Weapon)* skill. The Blade does base 2d6 damage while the claws do base d6+4 damage.

Popclaws use up 1 Active Points for claws, 2 for a blade.

Tail (+150,000 Cr, +3 kg (cat), 5 kg (Monkey) 15 kg (Gator) NOMP)

This is an appendage that comes from the hind-end of the character, similar in some ways to the Tentacle, but generally less capable of manipulation. A tail can come in a variety of forms (each however count as separate morphs): from the flexible "cat's tail" to the thicker "alligator tail" and the more radical "fishtail".

- ⌘ A **Cat's tail** is not so much for manipulation as for balance (it can "whip" by command but is not fully prehensile), the cat's tail gives the user a +3 DM on all balancing tasks and allows them to land on their feet from a long enough fall (anything over 3m).
- ⌘ The **Alligator tail** on the other hand is thick and hard enough to whip around and clout someone in combat (if in range), treat the Alligator tail as a short (50-75cm) thick tentacle (page 27-28) with stats: Strength 7 (+0), Dexterity 5 (-1); the Alligator tail is not fully prehensile (although it can be used to strike opponents), but it also provides a +1 DM to balance tests as the cat's tail above.
- ⌘ The **Monkey tail** is a medium length (1 m-1.25m) fine-to-average-thickness tentacle (page 27-28) with stats: Strength 5 (-1), Dexterity 7 (+0). The Monkey tail is fully prehensile (it's actually a specific kind of tentacle rather than a tail), but not as much for balance (only a +2 DM).

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- /// The **fishtail** is an interesting tail modification that “seals” the legs together and streamlines the lower body, allowing the subject to swim up to three times faster than normal in water, but of course normal ground movement (walking/running) is severely hampered (as in, no way they can do it and they have to crawl – poorly – for 1m/minor action).

A Cat's tail will use up 1 Active Points, an Alligator's Tail or Monkey's Tail will take up 2 Active Points and a fishtail will take up 3 Active Points.

Tentacle (+200,000 Cr, variable NOMP)

The tentacle is a flexible limb, usually extending from the back or from a major limb. The tentacle tends (in the larger sizes) to be quite a bit longer and stronger than tails, which also have different kinds of anchoring and serve a balance purpose. Tentacles are primarily used for manipulation and come in “fine” and “average” thicknesses.

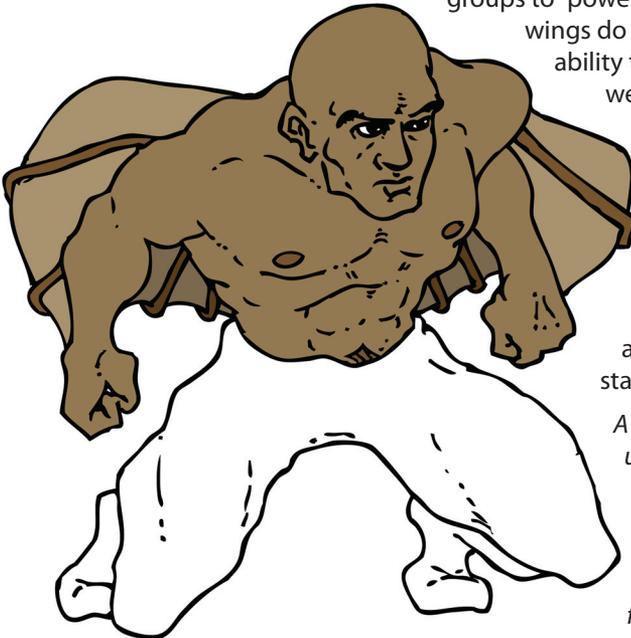
See Tentacles (Page 27-28), “Fine” Tentacles cost 1 Active Point (and 5kg) for 50cm and 2 points (and 10 kg) for 1m, “Average” tentacles cost 2 points (and 10 kg) for 50cm, and 4 points (and 20 kg) for 1m.

Wings (+350,000 Cr, +10kg NOMP)

The wing morph sprouts flexible but tough skin-like material under the arms (like a bat's wing or patagia), along with enhanced muscle groups to “power” them. The

wings do not have the ability to allow normal-weight users to fly unless in one-quarter gravity or less, however they can glide relatively well in standard atmosphere/standard gravity .

A pair of wings uses up 3 Active Points in material and buttressing/ strength enhancement for effective use.



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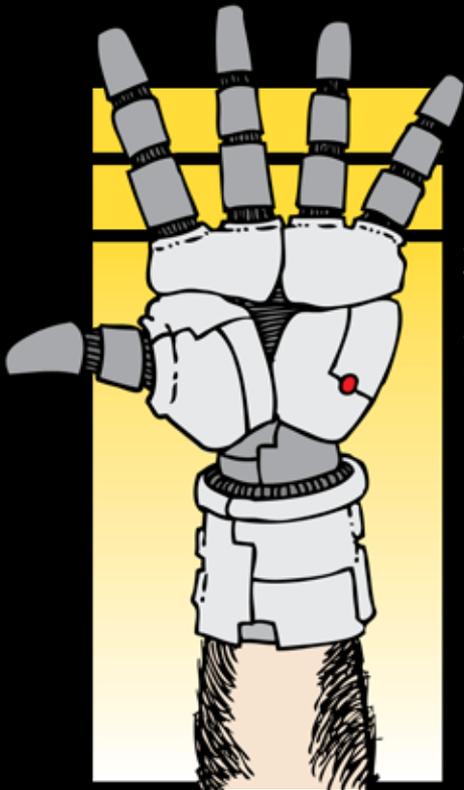
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