

AUGMENTATION™



SHADOWRUN

CATALYST
game labs™

CORE MEDTECH RULEBOOK

UPGRADE OR DIE!

Augmentation is the advanced medtech rulebook for *Shadowrun, Fourth Edition*,

covering everything you need to know about implants—including new **cyberware** and **bioware** and where to score the surgery. It provides detailed overviews of **genetics** and **nanotechnology**, from regrowing limbs to lethal cutter swarms.

It also previews the **bleeding-edge of medtech**:

bio-drones, cybermancy, and full-body cyborgs.

Augmentation contains everything players and gamemasters need for implants and body modification in *Shadowrun*.




SHADOWRUN[®]

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AUGMENTATION



ASIAN DRAGON -
LOCATION: LEFT
RHL, BOTTOM
SIZE: 38.75 POINTS
AXIS:
X: 800254.25
Y: 800025.36
WIDTH: 100X
HIGH: 109.25X
H: 50
V: 50

GENERATING NANOTATTOO:
PROGRESS

TRIBAL

CAMO - BRICK WALL

ASIAN DRAGON

CAMO - WOOD

CAMO - URBAN

CAMO - SHADOW

CATALYST GAME LABS

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(cool links)
- <http://www.dumpshock.com>
(Shadowrun fan forum)



Connecting Jackpoint VPN ...
... Matrix Access ID Spoofed.
... Encryption Keys Generated.
... Connected to Onion Routers.
> Login

> Enter Passcode

... Biometric Scan Confirmed.
Connected to <ERROR: NODE UNKNOWN>
"Man is only man at the surface. Remove the skin, dissect,
and immediately you come to machinery."

JackPoint Stats

66 users currently active
in the network

Latest News

- * <sticky> This private p2p MoSoSo network is still in beta-test, so pardon the mess and report any glitches to me. – FastJack
- * <081870> The security audit went a bit longer than expected, but has been completed. Thanks for the bug reports! – FastJack

Personal Alerts

- * There have been 3 unauthorized attempts to access your PAN
- * You have 0 new private messages
- * You have 1 new re-routed, anonymized, sanitized message from "Ms. Brackhaven"
- * You have 5 new responses to your Jackpoint posts
- * Your filter has blocked 16 messages from "OI' Ball and Chain"
- * Your Ganesh virtual pet desires feeding

First Degree

You are hidden from all contacts.

Your Current Rep Score: 48
(96% Positive)

Current Time: August 20, 2070, 0704

PREFERENCES

FEEDS

TASKS

LINKS

HISTORY

Welcome back to Jackpoint,
omae; your last connection was
severed: 13 hours, 13 minutes,
18 seconds ago

Today's Heads Up

Need some new lube for your implants? Worried that shady street doc put a little something extra in during that last visit? Looking forward to some nice relaxing months

in a rejuve vat? Want a new cobalt blue transgenic pet to match your couch? We now have a complete guide to medical technologies of all varieties under the [Augmentation](#) tag for easy reference. [\[Link\]](#) [\[Guests\]](#)

Incoming

- * Clockwork and Picador are scraping together some fun facts on the latest guns, toys, and vehicles. [\[Tag: Arsenal\]](#)
- * Just back from a working vacation in a nice, quiet, secure, gated community? Review your fave biz zones here. [\[Tag: Corporate Enclaves\]](#)
- * Ever wonder how your team's hacker kicks so much Matrix ass? Find out everything you need to know in our upcoming guide to Matrix ops. [\[Tag: Unwired\]](#)

Top News Items

- * NeoNET subsidiary FTL Matrixware has announced a release date for its new security software that it claims can distinguish technomancer "sprites" from ordinary programs. Critics remain skeptical. [Link](#).
- * Greek authorities confirmed the recent theft of several artifacts, including the mysterious Phaistos Disc, from the archaeological museum in Herakleion, Crete, Greece. One official stated, "We will not rest until these priceless artifacts are returned to our country." Interpol is investigating, but there are no suspects at this time. [Link](#).
- * Based on the very successful Desert Wars franchise, the first season of the highly-anticipated Rad Wars will be held this coming fall in and around the former French city of Metz, in the specially-contained and contaminated Saar-Lor-Lux (SOX) area. [Link](#).
- * Japanese officials are investigating the deaths of a half-dozen reputed Yakuza members who were reportedly forced off a bridge into Osaka Bay during a running firefight with Shiawase security personnel. According to a Shiawase spokesperson, the criminals were attempting to steal a truck full of highly-anticipated Sim Station XX6500 gaming consoles, due to be released next month. [Link](#).



CHAT

MESSAGES

FILES

POSTS

NEXUS

SEARCH

Active



ComStar
Firewall

Active



Jack-in-the-Box
Antivirus

Active



SpamWitch
Filter

On/Receiving



Termcode

Excellent



Signal

Active



Hidden
Mode



Loco
Map

AUGMENTATION

Invited Guests

KAM Kephalos

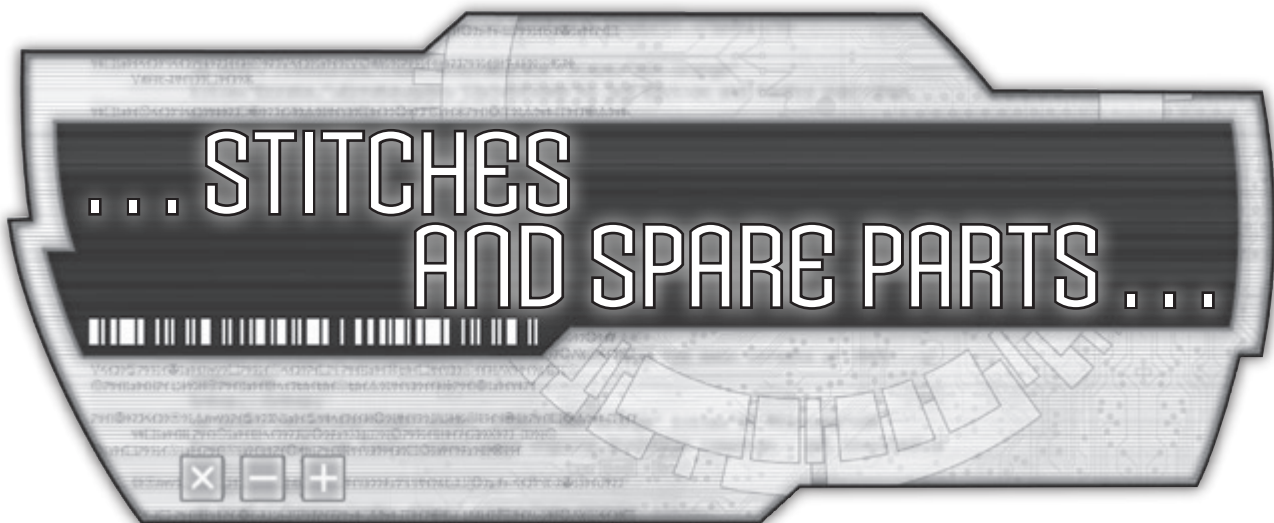
Posts/Files tagged with "Augmentation":

- * Cybertech
 - * Biotech
 - * Genetech
 - * Nanotech
 - * Medtech
 - * The Cutting Edge
- [\[More\]](#)

CONTINUE

ADVANCED
SEARCH

SAVE



... STITCHES AND SPARE PARTS ...

Two things you learn fast in this business—the quickest way to guarantee you'll get a call is to light up a butt or grab some stuffers, and the worse the weather, the more calls you're gonna get.

I was eating and Gonzo was having a smoke, so of course we got two calls. Two clients, same place. The AR showed location, best route, ETA, and all the vitals the DocWagon bracelets could grab. Didn't look good—Lone Star chatter hinted at a firefight at an Aztechnology facility. Dangerous, sure. But that's why the initials on our jackets said HTR—High Threat Response.

We didn't run sirens—it wouldn't have done any good—but we made good time despite the heavy rain. The drill was to grab 'em, stuff 'em in the wagon, and get the hell out before things started shooting at us. Treatment came later, since the facilities in the rig were better than the field kits anyway.

This one was bad, I could tell right away. It looked like a miniature warzone, with bodies strewn all around—sec guards and shadowrunners. I stepped out near a troll body riddled with bullets, his face blown out, rain spattering his brains. Beyond, a guard missing the left side of his head was draped grotesquely over a parked car. From far off, sirens meant the imminent arrival of either the Star or more corpsec—bad news either way. My commlink homed in on our two clients and I quickly relayed the information to Gonzo's AR. "Get her!" I barked, pointing at a moaning female ork curled into a fetal position near the outside of the fence, her leg a twitching mass of blood and sparking wire. "Leave the dwarf. Nothing we can do."

"What that fuck?" he protested. "He's right *there!*" He gestured madly at the huddled form of our second client, just on the other side of the fence. Above him, the jaguar-head Aztechnology logo gleamed in the driving rain.

"Get your ass over here *now* and help me! You forget your training already? Extraterritoriality. We can't go in there and you know it!"

For a split-second Gonzo hesitated, just idealistic enough that he still thought we could buck the system to save a life. We could have saved the guy, too—we both knew it. But extraterritoriality is a harsh master, and anybody who flouts it gets hung out to dry. Way of the world, *omae*. Hell, even our ork client was going to have to deal with it—the Azzies knew we had her, and they'd be filing extradition papers within an hour.

"Fuck!" Gonzo yelled in frustration, then pelted over and joined me at the ork's side. We hustled her onto the stretcher and into the back of the wagon.

"Get this thing turned around," I ordered. "I'll be there in a minute." Without waiting for an answer, I glanced toward the approaching sec-team and then hurried over to another body slumped nearby. A few deft cuts and I was done. Hey, he wasn't a client, he was dead anyway, and you can't let 'ware like that go to waste—not on what they're paying us. I ducked low and headed back to the rig at a run.



MEDICAL PRACTICE IN 2070

Posted By: Butch

Medical science has soared ahead since the turn of the century, impelled and transformed by developments in genetics, cybertechnology, biotech, and nanotech. Medtech has revolutionized the tools and techniques at our disposal. Corporations, hospitals, local clinics, independent doctors, and scientists are constantly looking for new ways of stretching the envelope: repairing damage, providing cures, prolonging life, and enhancing metahumanity. Bound tightly to these continuing advances are the never-ending requests from the private and public sector, asking the scientists and doctors for the next treatment option, the next way to make their employees more efficient, the next way to boost their looks, or the next way to get an edge on the street.

Medtech is the catch-all term for advancements in medical technologies, and like other areas of science, the overarching field of medicine never seems to stop advancing. The larger field of medtech can still be broken down into smaller distinct fields—health care, augmentation technologies, genetics, neurology, etc—each containing any number of specialty fields. The various fields overlap to some degree, but for the most part, they focus on complementary aspects of medicine.

Medical response times are faster than they've ever been, recovery and survival rates are also at an all-time high. Like everything else in 2070, however, such service and treatment comes with a pricetag. Not everyone can afford the best care, leaving most folks to settle for the best care they can afford—which often means putting themselves at the mercy of sketchy black clinic “specialists.” For the most part, the doctors and caregivers aren't so much concerned about healing all that need help; nuyen truly cures what ails you.

Being in the black market medical biz myself, I've had many people on Jackpoint (and off) ask me for references on reliable medical services. Judging by the inquiries I've received, I'm amazed by how little most runners seem to know about the people into whose hands you're putting your lives and what they actually do. Given how dangerous ignorance is in our line of business, I think this is slightly suicidal. So here, for your edification, is a little something I've patched together with a little help from some acquaintances in both the public and private health sectors. I'll be posting it around to other shadow nets once I get some feedback. Consider this a public service.

MEDICAL PROVIDERS

For our purposes, medical care providers fit into two broad categories: legal and illegal. Each operates very differently so I'll address them separately since your options aren't always clean cut. They offer different services, have different quality of care, and most importantly have different hoops you have to jump through. Keep in mind that while what I'm describing is standard in most modern sprawls, drop off the beaten track and try to find a doctor in Kurdistan or Caracas and the rules will be slightly different.

Let's start with the legal stuff. Legal health care and augmentation providers can generally be boiled down into public, private, and corporate services. Each has its nuances and standard operating procedures, but they have a lot in common too. The advantage to legal medical services is that finding one in a bind is easy—they're listed in all the main directories. Corporate

MEGAWATCH TOP 10 MEDTECH CORPS TO WATCH IN 2071

Medical technologies continue to advance at a continuously accelerating rate. We all know the Big 10 have their fingers in everything, but if they don't keep on top of their game, there are numerous innovative, mean, and hungry medtech corps that have the opportunity to surge right past them, riding a fresh wave of medical science breakthroughs. According to our sources, these 10 corps (in no particular order) are the ones to watch next year.

Characorp (Vedacorp)

The medical division of the Sri Lankan-based Vedacorp, Characorp is pre-eminent throughout many South and Southeast Asian markets, where they also provide emergency transport and medical services. The corp also maintains a significant and controversial presence in the pharmaceutical industry through subsidiary Veda Biomedical, despite—or perhaps because of—hefty charges of biotech piracy leveled by other corps. Characorp is also active in the personal augmentation market, developing an impressive range of low-cost bio-implants and cybersuits, and their numerous public and private hospitals continue to be a top destination for medical tourists. [Full Profile.](#)

Evo

The foremost AAA megacorp in medtech research and development, Evo is working hard to bring the world closer to its vision of a transhuman future. Their innovative and productive designers and experts continue to make inroads into diverse areas of bioware, cybertechnology, genetechnology, and nanotechnology, and they have captured the market for metahuman-specific augmentations. Their Red Star and MetaType clinics continue to expand worldwide, hand-in-hand with their global CrashCart armed medical service franchise. [Full Profile.](#)

Genesis Consortium

This Latin American giant continues to win over consumers and green-minded corporations with its creative and eco-friendly organic technologies, particularly bio-fuels, genengineered anti-pollutants, and transgenic pharmaceuticals. Where the company is really making waves, however, is with its weird but engaging line of bio-symbiont implants. Expect a marketing blitz in the near future to overcome the symbionts' unfortunate “ick factor.” [Full Profile.](#)

Continued on page 8

Urgent Message...

STITCHES AND SPARE PARTS





hospitals and private practices also advertise extensively and body clinics, big and small, can be found in every other mall and high street—though the former may only service corporate citizens and business partners. Unfortunately for people in our line of work, being legal also means more hoops and unwanted attention: valid SINs, positive credit account, extensive medical records, contracts, and an often chummy attitude with law-enforcement.

If you're just looking for the simple stuff, you'll find it available at corner bodyshops, shopping malls, and sometimes even your neighborhood convenience store. Hair alterations, eye mods, skin pigments, and even simple implants like circulation enhancers and vision and hearing aids are available just about anywhere for a modest price. The fancier stuff will cost more, but availability isn't an issue. The more exotic your needs, the harder it will be to find someone to fill them. Need a cybernetic finger with a secret compartment? You'll need to visit a corner doc or a backstreet hacker to get that installed. If you need to get replacement organs or limbs cloned up for the future, you're looking at hitting a hospital or medical care center appropriately equipped to handle your needs.

I pulled some strings with different contacts in the biz to get some write-ups of how things work in their particular niche:

IN PUBLIC SERVICE

Author: CK, Uploaded By: Butch

- "CK" is Chainsaw Kelly, the moniker for Dr. Kelly Fairchilde, who works out of Seattle General. She and a couple of her colleagues do some off-the-record body work and patch jobs.
- Butch

Most major municipalities possess at least a couple of public hospitals and a few dozen clinics. The Seattle Metroplex, for instance, has over 50 public medical providers. It might be cause for amazement, but even in this day and age most governments still strive to maintain some form of public healthcare, though the system is globally overworked and chronically undermanned, underequipped, and underfunded.

Quality doctors and nurses find better-paying corporate jobs, so the quality of service in public hospitals is average at best. That's not to say there aren't some talented individuals working in public hospitals—usually starry-eyed idealists who are actually in medicine to help people, though they rarely stay that way for long. Corporate and private practices tend to get the pick of the litter, leaving us with, well, everybody else. We do our best—well, most of us—with the hand we're dealt.

Public health centers like Seattle General are also usually strained and overwhelmed by masses of the poor and destitute, deprived of other access to medical care, so getting medical attention usually requires a wait of several hours, unless the situation is critical. Treatment for the needy and indigent is provided without impacting medical costs for other patients. That means that if you account for the administration's class biases and racist streaks, a human suit will see a doctor in half the time an ork squatter has to wait. If you're looking for outpatient care, you're better off, since we've only got about 250 beds and 3 functioning operating theaters at any given time—don't even get me started on the state of our equipment.

Interneurox

This previously unremarkable private biopharma corp is on a rising trajectory, fueling speculation of heavy investment support from unknown benefactors. The corp seems to be taking a definite turn towards research into neuropsychopharmacology, making several impressive breakthroughs in the past two years with neurochem manipulations (important for implants with a direct neural interface) and neurotrophin treatments for brain damage and headware trauma. Of particular interest, however, is their recent "acquisition" of half a dozen of the world's foremost neurologists for as yet undisclosed projects. [Full Profile.](#)

Kyuusei Medical

Despite numerous sanctions for lax containment procedures and violating environmental regulations, as well as rumors of banned biowarfare research, this Salish-Shidhe corp remains a major pharmaceuticals manufacturer. Rumors insist that Ares is seeking to exclusively license Kyuusei's upcoming batch of combat performance drugs—and a hostile takeover is not out of the question. Also of note are the repeated hints that Kyuusei is working on a major breakthrough involving HMMHV. [Full Profile.](#)

Mitsuhamma

Global leader in the production of micro-tronic components, robotic controls, and myomer musculature for cybernetics, Mitsuhamma has expanded its interests in industrial nanotechnology towards development of state of the art personal nanoware. In recent years, its own lines of consumer cybernetics have declined despite the fact that the company remains the premiere supplier of third party cyberware components. Less focused on biotechnologies than its counterparts, Mitsuhamma's Parashield subsidiary is still making headlines with many of its new bio-drone releases. [Full Profile.](#)

Renraku

Though Renraku's had a tough decade, their cybernetics divisions have remained relatively unscathed, continuing to manufacture some of the best microelectronics, microcontrollers, and micropower systems available. Their future success in this area is under attack, however, as the Japanese mega has been trumped by rivals like Spinrad Industries with hot new optimized and modular cyberlimb releases. Expect Renraku to hit back hard. [Full Profile.](#)

Continued on page 9

Urgent Message...

STITCHES AND SPARE PARTS



Shiawase Biotech (Shiawase)

This venerable powerhouse of the medical industry remains in top form. Shiawase Biotech continues to develop and produce much of the medical equipment used by other corporations, as well as raking in nuyen on the numerous patents they possess for implantation techniques and several exclusive bioware templates. While less focused on innovation than Evo or Universal Omnitech, Shiawase has a reputation for high-quality and resilient cyber and bio-augmentations, as well as state-of-the-art nanoware and medical nanotech systems. Rumors persist that Shiawase Biotech is planning to open a full-blown medical service and emergency response division. [Full Profile.](#)

Transys Neuronet (NeoNET)

Tapping the surging market for Matrix and AR-related cyberware, Transys Neuronet's expertise in nanotech, biotech, neuralware, and advanced cybernetics has allowed NeoNET to rise to the top ranks of the augmentation industry. Having a great dragon as their R&D director probably helps. In addition to releasing the cutting edge designs for Matrixware next year, Transys will also be breaking new ground with senseware and specially-designed neural interfaces for various types of critters and non-metahumans. According to reliable sources, Transys is also hard at work on a new line of technomancer augmentations. [Full Profile.](#)

Universal Omnitech

The top non-AAA medical corp, Universal Omnitech's diverse profile of interests puts most other corps to shame. If it has to do with the medical sciences, UO excels in it. Above all else, however, their genetics know-how and talent is unparalleled. Their genetics databank is an intellectual property gold mine of gene sequences, genengineering tricks, and proprietary techniques. Most importantly, the corp is on the verge of making low-cost corrective genfixing and germline therapies widely available to the world at large. [Full Profile.](#)

Theoretically, anyone can walk into one of these centers and get care. Realistically, if an individual doesn't have cred/insurance or a SIN, legit or otherwise, he's pushed to the end of the line and can even be legally denied service. Citizens who cannot immediately pay can still receive treatment by attaching a mandatory loan to their good credit rating at what are, I'm told, reasonable interest rates. Though, these days, policy is to accept up-front nuyen pay-

ments for those people who don't want to offer up their SIN or who don't have one, it bears reminding that this is a public institution and follows local laws—meaning it's even odds whether someone will sedate you, treat you, then turn you over to the local authorities if it looks like you've been involved in something illegal.

- Making a SIN and credit line pretty much essential, even if you just need a prescription filled. The SINless can't just walk into a hospital and expect to get a cure for what ails them. And you'd better have the nuyen or it's a toss-up between being in hock for the next decade or selling off an organ or two.
- Beaker
- Do yourself a favor and make sure your SIN (real or fake) has a clean bill of health. The last thing you want to deal with is a question-and-answer session due to some inconsistency. Governments don't like to advertise the fact, but medical histories can be tracked via SIN along with the usual data. Extremely private information is available out there if you know where to look. Imagine a runner being able to determine a certain CEO's medical needs and using that information against them.
- Glitch

Speaking of the authorities, the staff is required by law to alert the Star if someone walks in with a medical condition that is in any way related to illegal activity. If you tell the nurse you were mugged and hit over the head, are suffering from a drug overdose, can't explain where the bloodstains came from, or have a gunshot or stab wound, expect a cop to come calling. I hear that threats and bribes sometimes convince the staff to overlook such things, but would you risk your freedom on it?

Standard conditions in public health centers are often precarious and many procedures (and all surgery) require payment up-front, as well as signing of various responsibility waivers. We might not have cutting-edge equipment and all the gadgets, but places like Seattle General are equipped to perform most standard procedures and surgeries—though few if any clinics and hospitals offer augmentations except for strictly prosthetic cyberware or bioware. It should come as no surprise, conditions being what they are, that many public-service medical professionals supplement our meager wages by undertaking illegal operations on the side.

- While I'll take Butch's word that Kelly is on the up and up, it isn't that unusual for public-hospital staffers to have seedier sidelines. A handful of nurses down at the Pacific Hospital in LA were caught selling corpses or used implants to Tamanous organleggers just last month, and I know at least one hospital in the Denver area whose staff are engaged in some unauthorized clinical drug testing. So much for the Hippocratic Oath.
- Nephrine
- Seattle General has a mixed rep. On the one hand, it's one of the few places the desperate can go for care. On the other, rumors of incompetency and malpractice, organ-legging, and illegal bodyshops like the one Dr. Kelly here operates never seem to go away.
- Fatima



Public hospitals also offer limited emergency medical services to the surrounding community. Unlike DocWagon or other armed medical providers, we have neither the means nor the will to provide high-threat response, and our ambulance drivers will call in Lone Star at the first sign of trouble. Seattle General can't afford a full-time security department, so we have security outsourced to Lone Star, which has a contingent onsite.

While public healthcare facilities like Seattle General are usually government-run, some sites are privately-maintained, usually held by corporations looking for a public relations boost, or by some "charitable" entity such as the Catholic Church. Privately-owned facilities tend to be slightly more professional and less seedy than government sites, but they face many of the same hurdles we do.

- In some parts of the world, public hospitals don't restrict themselves to modern, Western medical techniques. Alternative therapies are particularly common in Awakened nations and other cultures where traditional practices have never fallen into disuse or disrepute. Hospitals that are part of the Hong Kong Hospital Authority, for example, have resident physicians versed in traditional Chinese medicine including acupuncture, qigong, and herbal lore.

- Ma'fan

PRIVATE PRACTICE

Author: Dr. Mujib Davindha, Uploaded By: Butch

- Mujib runs a small but profitable private clinic in Vancouver. The Salish have a lot more red tape than we're used to in the UCAS when it comes to bio- and cyber-enhancements, but basic medical treatment and health care are much better. Like many other private practitioners eking out a living on the scraps left by the big boys like DocWagon and CrashCart, Mujib has been known to overlook paperwork and does the occasional patch job for shadowy types.

- Butch

For those with more discerning taste or more nuyen available to pay the bills, there is really no choice between privatized healthcare and public care. Private healthcare is superior to public care in that you normally don't have to wait to be seen—you're paying for the privilege of service as you need it. The means at our disposal and the variety of services the private sector performs puts public services to shame. Private healthcare staff is also generally a notch above public, and the big companies boast some of the best medical talent in the field.

- Technically even tribal shamans and traditional medicine men qualify as private practices under UCAS legislation.

- Lyran

The catch with private clinics and hospitals is that they're owned, funded, and operated by private interests. Medicine is big money, and in the private domain you can find everything from medtech giants such as Universal Omnitech, Evo, and DocWagon to small-town GPs (general practitioners). The descriptor generally includes medical corps, private-practice practitioners, military health services, university clinics, franchised personal enhancement clinics, and those maintained by special interest groups.

Unlike public med-centers, private sector providers can choose to whom they sell their services. They can be as selective as they want or not. Most private services tend to focus on a select clientele, interest group, or alternately a medical specialty, though the major players don't shy away from any potential profits.

While private hospitals and medcorps offer the full spectrum of medical procedures (including diagnostic, psychiatric, genetic, maternity, surgical, and emergency services), most private clinics and practices tend to specialize in one field of medicine or personal augmentation.

Big-time private providers generally have you sign a contract and set you up with a client account that regularly debits your bank account. Almost all megacorp citizens/employees have this sort of arrangement by default, with services provided by their particular megacorp's pet medical arm. In return, you get varying degrees of medical coverage and the full resources and talent of that corporation's franchise clinics and hospitals at your disposal in case of disease and trauma. You can even get riders to add family and friends to your account. Such providers even offer clients discounts on bio- and cyberimplants, gene therapies, and nano-treatments. Some contracts even cover the costs of implant surgery at their clinics. If the provider has a transport service, like DocWagon, they will come to you wherever you are and bring you to the medical facilities, treating the worst of your injuries on the way.

Extraterritorial corporate clinics pay lip service to local laws on implants to maintain good relations and a community-service façade, but the right amount of nuyen or a marker with a corporate patron can inspire them to conveniently ignore such trivialities behind their sovereign closed doors.

- Well, mostly. DocWagon can't go just anywhere. The corps still have no-trespassing zones, even for medical services.

- Hard Exit

- Private facilities also boast better security measures—and I'm not just talking sec-guards. Convenient and mandatory RFID visitor badges will guide you directly to the friend or family member you are visiting all right, displaying holographic directions and warning you when visiting hours begin and end. They are a leash as much as a map, though, and they'll alert staff if you stray or get "lost."

- Butch

- And if you are lost enough, those staff members will be armed.

- Black Mamba

- No joke. Every biomonitor, staff card, and visitor badge is equipped with RFID and reports continuously to the security system. If you wear a visitor badge, they'll know what room or hallway section you are in. If you don't, then you're an unauthorized person almost everywhere.

- DangerSensei

- Private services will also coat your medical records with extra IC. Don't think this makes them completely safe though. If you have an account with CrashCart, for example, an Evo Johnson can get your records with a snap of his fingers.

- Glitch



- A word of caution: some corporate providers keep genetic and/or tissue samples from their clients in storage as a matter of policy—especially if they know you're a runner, Awakened, or someone important. This gives them a databank of their own for criminal forensics, and a bit of insurance in the way of ritual magic. On the other hand, while the storage vaults are usually fortresses in their own right, they might have a sample that will make a job of yours much simpler.

- Jimmy No

Smaller clinics, like my own, work differently. We build up our clientele old-style, tend walk-in clients, get referrals from satisfied customers, and offer more in the way of anonymity and confidentiality than most of the big players. We play looser with the paperwork, and I've even been known to do house calls—it also helps that we're more affordable. While my small clinic handles mostly general health care, trauma treatment, and minor augmentations, other small specialty clinics offer alpha- or beta-grade personal enhancement, biosculpting and plastic surgery, gene therapies, and other advanced services.

Generally speaking, private healthcare has better access to expensive or rare medical technologies, and some clinics specialize in cutting edge technologies you won't find anywhere else outside corporate research labs. Other than the corporations themselves, private health companies provide the best medical care and medical options out there—for those who can afford it.

- DocWagon and its counterparts are inordinately popular among runners for a reason: their clinics maintain extraterritorial status, and a patient's location and records are generally confidential. You should check your contract, though—in many jurisdictions, DocWagon policy is to acknowledge extradition requests from Lone Star and other corporate security institutions following treatment.

- Butch

- Yeah, but as I recently found out, they've been known to ignore requests if your contract is Platinum or better.

- Hard Exit

FRANCHISE BODYSHOPS

Author: Harry K., Uploaded By: Butch

- Not his real name, but "Harry K." is my contact in one of the major Seattle-area franchises. He makes a tidy bundle supplying several street docs like myself by arranging for inventory to be misplaced and implants to get lost in transit.

- Butch

It may surprise people to know that a recent Evo study placed the number of people who have undergone some form of augmentation at close to 50 percent in developed nations. Personal enhancement is all the rage and not just among professionals and on the fringes. According to the same survey, there's a growing acceptance of augmentation technologies—particularly biotech and genotech augmentations, but to a lesser extent cybertech—at all levels of society. Personal augmentation has become the first major investment amongst young professional adults (beating out even cars and bikes). While the vast majority of augmentations

are either cosmetic or minor functional bio- and cyberware, a not-inconsiderable portion of those procedures were performed by the blooming industry of bodyshop chains and clinics.

- I read that report, though it's telling that the figures only cover SINners.

- Snopes

- If you're getting the impression that bodyshops can be equivalent to fast food for implants, you're getting the right idea. At the lower end of the scale, the service quality is the same or worse as you'd get at your local grease pit, and you'd better pray you don't pick up an infection or that your new implant doesn't come pre-loaded with spyware and adware. On-site security tends to be minimal—we're talking sec-cams and panicbuttons—which means that your med records are vulnerable too.

- 2XL

You've seen them in the malls and the high streets. From family stores like the Body Pagoda and Body+Tech to upscale bodyshops like Nightengale's, Spin Shops, and Executive Body Enhancements, competition has become cut-throat as demand has exploded. Everybody is looking for their piece of the pie and is willing to play dirty to carve out their niche. Of course, the majors have also caught on to the billion-nuyen industry in affordable consumer augmentations: Evo's opened their first Red Star Clinic in the UCAS in Seattle, Horizon is delving into the low-end consumer market with A Whole New You, and rumor has it that Monobe and Yokogawa are in a bidding war over Ginseng Health boutiques in Japan and Korea.

- The advent of AR in the past five years has been a boon to bodyshops everywhere. Cybereyes with integral imagelinks and cyberears have become the best-selling cybertech augs on the market. In some corporate circles, they're seen as an essential upgrade.

- Cosmo

From the simple data-processing implants to stylish bio-implants for occupational and personal use, your local bodyshop can line you up with a wide range of elective procedures. While most shops only stock basic implants, many of the bigger companies and megacorporate subsidiaries will keep some alpha and beta-grade wares in stock. Even cultured bioware can be placed on order if you're willing to wait. For clients who have the correct permits assigned to their SINs, even some security grade modifications are possible—though major transplant and replacement surgery is outsourced to affiliated clinics rather than performed in main-street shops.

- There's the rub. If you want a datajack or a flash new set of eyes from the legit facilities, you'll need a valid SIN. Not so if you go through a street doc, which is how I stay in business.

- Butch

- It shouldn't have to be said, but do your homework before traveling anywhere you haven't been to before. Legalities are different all over the place, not just for weapons, but for just about everything. Cyberware that's illegal in the UCAS might be legal in Bangkok.



The prescription painkiller you bought in Seattle might be available over-the-counter in Aztlan. Or it might be so illegal that only the street-scum have quantities for a price. Do your research.

- Fatima

If you want legal 'ware, bodyshop chains are your best option for speedy and efficient implantation, especially if you're looking for a minor enhancement or an upgrade to existing implants. If you're packing illegal or restricted stuff, either make sure you've got a bullet-proof ID or stick to your friendly local street doc. Most bodyshops will report you if they suspect anything illegal (it could cost them their license if they don't), unless you happen upon an entrepreneurial-minded manager such as myself.

CORPORATE MEDICINE

Author: Dr. Orlando Cruz, Uploaded By: Butch

- An old friend of mine, Dr. Cruz is now retired to Miami. He spent a significant portion of his career working for Cross Biomedical, and I thought I'd ask him to fill me in on how things work in the corporate world.
- Butch

The various fields of medtech are ever-growing, with new research findings and new technologies available almost every day. At the forefront of this research, not at all surprising, are the megacorporations. Some are more invested than others, though you will find that most every megacorp has at least a small medtech division working on one medical advance or another. They simply can't afford to be on the wrong end of the research curve. Many corporations, including all of the AAA megacorps, operate health-care centers that provide corporate citizens and employees with medical services that run the gamut from cosmetic treatments to pediatrics to genetic augmentation. Such medical services are typically restricted to individuals possessing a valid corporate ID and SIN—or at least very good forgeries or a very friendly relationship with corporate hierarchy.

Corporate medical facilities possess the best equipment money can buy (or the mother corporation can provide) including medtech that hasn't reached the marketplace yet. The corporations, big and small, usually have the greatest access to the latest in medical technologies, and are usually in a position to be able to pass a significant cost savings along to their employees and their dependents. Being a company employee may be seen as detrimental to some, but for the most part, your average citizen can only dream of the health benefits that come with corp employment. If anyone out there ever decides to give up running and join society, going corporate is a good option if you want to live a healthy, long life.

- Yeah, but at what cost? I'd rather be my own man than a corporate suit. I'll take my changes running. At least my destiny is my own.
- DangerSensei

Elite corporate clinics are often the only source for certain procedures or implants. Corporate sites are also more likely to have alpha-grade or better gear, and their doctors are better qualified. It is their extraterritoriality, however, that makes them invaluable assets. Aside from providing general medical services, part of any

corporate medical service is a research and development mandate. This translates into performing clinical trials and field-testing prototype treatments, pharmaceuticals, and implants—procedures that corporations would be hard pressed to legally perform in many jurisdictions. On the flip side, a piece of bioware that cannot be legally installed at a Seattle public hospital might be obtainable from a Shiawase Biotech facility two blocks away.

- I had a friend working for Evo who got herself on a corporate payment plan for a complete set of cloned organs. She figured the way she drank, she'd need a couple spare livers, and the corporation helped her fund the replacements. Last I heard, she was on her third and had just been promoted to junior VP. She's also received various hardware implants as productivity bonuses.

- Cosmo

- Not all corp citizens live the augmented high life. I know a Mitsuhamma facility that specializes in plugging skillwires and other mandatory implants into the corp's low-end labor force. The treatment there is as impersonal as a revolving door, and by the letter of their employment contracts the workers have to pay for any follow-up visits and repairs out of their paychecks.

- Red Anya

It is common practice for company men and women to resort to such sites for trauma care and implantation, and even deniable assets have been known to strike deals with their corporate liaisons to gain access. Corp-sponsored clinics have their downsides, however. It is worth noting that the corporation controls the medical environment, so there is always the possibility that it might retain biological samples, include some unwanted implants or, more likely, that confidential information on a character's medical history, his health, augmentations, and the procedures he's undergone will be logged on corporate records somewhere—just waiting for someone at the mothercorp to cross-reference them someday.

ARMED EMERGENCY SERVICES

Author: Matamo Kenji, Uploaded By: Butch

- Matamo Kenji is a Yakashima exec with whom I got a little too friendly after an Afghan Nuke too many in the bar after a convention. The following consultant's report was on his commlink—seems like there might be some truth to that rumor of Yakashima being interested in Nightengales. He really shouldn't have left the link in his pants; I'm an early riser.

- Butch

Spiraling urban violence, the privatization of police services, and the rise of corporate jurisdictions have combined to end the aegis of neutrality over medical personnel in our time. In much of the world, the rules of engagement have changed so significantly that ambulances taking away wounded enemies are as valid a target as the wounded and dying they come for. This holds true for urban settings as much as the modern battlefield.

If anything, corporate affiliation can be blamed as much as urban and gang violence for the passing of the ideal of the medical practitioner as a neutral force; after all, a corporate doctor is



understood to be a loyal member of the corporate family first and foremost. Further, laws that once existed to require medical providers to assist anyone in need are, in many cases, void. Medical companies take sides, and they will not treat those who cannot pay or who hold affiliations with rival entities.

The resulting response, as we know, has been equally drastic. With emergency response units becoming valid targets, the corporations running such services have responded by raising the stakes and arming them. EMTs wear body armor and carry sidearms even for routine transports, and High Threat Response teams travel under spirit protection and count on trained combat specialists as well as paramedics. Most of the contract medical care providers now operate armed response emergency units, and such services are integral to their core client contracts.

Emergency medical response is a time critical and extremely lucrative venture, which at times has produced bitter rivalries and even open conflict. For now, the various emergency transporters seem to be on relatively good terms. Each company has a contract with the others that allows them to pick up patients that only they can reach in time. DocWagon seems to have decided that it would rather split the money with CrashCart than allow a patient to get immediate medical care for free.

Shiawase has been making objections to these practices in the Corporate Court, even using the dreaded words “restraint of trade.” The move has surprised insiders, who can scarcely believe that a pot would call a kettle black in such an obvious manner. It’s a good bet that Shiawase is going to launch their own medical response company in the near future, which should be taken in consideration in any expansion plans.

DocWagon

DocWagon was the first company to offer armed medical response to the public and is still the largest. Of the existing providers, DocWagon has the most ambulances and the largest service area, utilizing a fleet of land and air ambulances on every continent. They even have the contract to provide medical care to the Mt. Kirkpatrick arcology in Antarctica. The corporation has been quite successful at franchising itself and conducts non-emergency medical transports for a number of hospital consortiums. It maintains the largest cloning facilities on the planet, keeping a medical clone of every Platinum service contract holder.

- I have reason to believe that DocWagon continues to maintain medical clones of people who cancel their Platinum service.
- Kane
- I have reason to believe that they don’t.
- Hannibelle

As the pioneer in the field, DocWagon fielded its signature 10-minute guarantee clause (actual guaranteed time varies by region) as proof that it would stand by its service claims, forcing other providers to issue similar promises.

- They’ll pull out all of the stops to make that 10-minute response time, including the use of the movement-enhancing powers of spirits summoned by DocWagon wage mages. I’ve even heard of

DocWagon hackers installing backdoors in traffic grid networks so they can hack a clear route for important clients.

- Rigger X

CrashCart (Evo)

CrashCart was heavily bankrolled at its inception in 2052 and was quite clearly intended to destroy DocWagon. It suffered some scandals in those first years, and the corporate heads were eventually forced to cut their losses. Since then, CrashCart has made an end run around DocWagon by establishing service contracts in uncovered regions, particularly throughout Asia. Though the rivals do still occasionally butt heads in areas where their services overlap, the current administrations have made peace efforts and drawn up a patient-sharing plan to ensure that clients are always transported in the minimum amount of time.

Beyond emergency response and hospital services, CrashCart leads the way in remote care. Using a powerful dedicated satellite network, CrashCart emergency medical specialists control a vast number of medical drones all over the world. The use of drones and remote medical care has cut CrashCart’s response times in many areas—a fact other providers have noticed. This system also allows the number of cases each doctor can handle to increase, reducing wasted man-hours substantially.

- Evo calls it “efficient” to keep its medical experts working all the time via telepresence. Since they’ve brought the number of doctors down too, however, medical mistakes have been on the rise.
- Nephrine

Info-santé (Ares)

Info-santé was originally the name of the state-operated medical service in Quebec, which was later privatized and subsumed into Cross Biomedical. Establishing a presence in some European countries as well as North America, Cross Biomedical was later bought out by Ares Macrotechnology and renamed Info-santé. Under Ares-appointed CEO Theresa Montgomery, Info-santé is ruthlessly expanding and pursuing new service contracts, leading to some tensions with DocWagon, CrashCart, and EuroMedis.

EuroMedis (ZIC) and BuMoNa (AG Chemie)

EuroMedis, a Zeta-Impchem subsidiary, has been in heavy competition with rival Bund für Mobilen Notfall Arzteinsatz (BuMoNa), itself a subsidiary of AG Chemie. Both provide emergency medical care throughout Europe and like to duke it out in the Allied German States. BuMoNa prides itself on efficiency and discretion, even implying in several trid adverts that their SIN checks are sub-par. EuroMedis has been playing the regionalism card, declaring itself the “European” medical choice and playing up the wide range of medical services it possesses and its rival doesn’t.

- I’ve been hearing for ages that BuMoNa is on the bidder’s block. Every time some corp makes an offer, another steps in with a bigger one, then the fur starts flying and no one ends up with the prize but everyone ends up with bodies on the ground.
- Red Anya
- Maybe BuMoNa is just trying to stimulate their stock prices.
- Mr. Bonds





INCOMING FEED.....

Characorp (Vedacorp)

Characorp is often overlooked among the major players because of its geographic base, but it is in fact the leading emergency response provider in much of South Asia. Due to the out-of-control vehicular and pedestrian traffic in the major cities (it can take as much as 10 hours to cross Mumbai by car), Characorp has gone almost entirely to aerial transport, much as Vedacorp's contract police division Indrajit has taken to an almost pure helicopter-based patrol strategy. Characorp has been gradually expanding into the virgin Middle Eastern territories and competitive Southeast Asian markets, where it faces competition from both CrashCart and Monobe Medical.

Other Providers

Aside from numerous A-rated contractors that tend to only provide armed emergency medical transport to a specific sprawl or region, a few other services deserve notice. **Medicarro**, an Aztechnology subsidiary, continues to cover Aztlan and several South American countries, despite recent scandals implicating high-ranking officials in drug smuggling rings. **Monobe Medical** maintains a solid reputation for its operations in Russia and other parts of Asia. Their contracts in Africa, however, are suffering due to an ongoing shadow war with **Careline**, the UK provider that also manages medical services in many major African ports and sprawls.

- It's also worth noting that non-corporate agencies have been known to establish their own armed medical services in certain areas—notably rebel groups, tribal groups, or syndicates controlling large swathes of physical territory. The Anarchist Black Crescent,

for example, offers volunteer-driven sporadic ambulatory medical services in a few lawless zones.

- Aufheben

SHADOWCLINICS AND STREET DOCS

Author: Dr. Glenn Swayne, Uploaded By: Butch

- Not so much a friend as a passing acquaintance, Swayne (not his real name, natch) operates a mid-sized shadow clinic in CalFree. I picked him because he's better connected than most street docs, and he dabbles in a variety of areas.

- Butch

- Before you read further, you should know that Dr. Glenn Swayne used to work in Aztechnology's department of unethical medicine until he was brought up on charges before The Hague. After his acquittal, he moved up north and now runs an independent shadow clinic in the CFS.

- Hannibelle

- Aztechnology has a department of unethical medicine?

- Beaker

- Not under that name, no.

- The Smiling Bandit

- *Omae*, even I saw that one coming.

- Slamm-O!



Disgraced surgeons turned back-alley ripperdocs, black clinics selling or testing experimental corporate 'wares, failed med-students or veterinarians making a living on their meager skills, or independent practices that engage in illegal procedures—what they all share is that they operate unlicensed and outside the law. Pretty much any illegal med-center or unlicensed practitioner operates under the same rules, be they elite shadow clinics or backroom street docs. They all specialize in illegal goods and services; in fact, many don't even bother offering legal 'wares and procedures. They also never require ID or SIDs, though they do require payment in advance.

The level of care available at a shadow clinic or street doc's chop shop can vary enormously and depends on the scale of the operation, its resources and medical talent, secret sponsors and, of course, how much the client is willing to pay. High-end underground clinics are usually sponsored by some powerful interest group, when they don't have shady connections with either corps or underworld syndicates. Such ties allow them the resources for high-tech procedures and new implants, whereas a lone-wolf street doc removing bullets in a corner bar's back room might have to make do with a battered old medkit and second hand cyber- and bio-replacements provided by even more unsavory sources.

- A "doc" who'll pull out bullets on a bar's pool table using a shot of whiskey as anesthetic is better than bleeding to death in the gutter. We can't always be choosy.
- Traveler Jones

Some people have asked me how an unaccredited independent medical contractor stays in business. Are there really enough people who want cranial bombs installed with no questions asked to pay the bills? Of course there are—the profit margin on those things is substantial. But a clinic does more than just install items of questionable legality.

First, there's the question of research. There is a fundamental limit to how much information can be gleaned from animal studies or computer models of metahumans. If you push the envelope far enough, you need the willing participation of the patient just to keep them alive, and a non-sapient subject just isn't going to give that to you. Of course, while necessary for the metahumanity's advancement, this kind of research is wildly unpopular with the lay public and is banned by many countries. So just as there are people who will pay to get experimental goods implanted in their bodies, there are corps who will pay clinics like mine to install them. Everyone wins.

- This may be common sense, but check your street doc's rep. It's not the disgraced doctors, convicted researchers, shellshocked former military medics, or corporate-expats-on-the-run you want to worry about it. No, it's the slobs who slotted a "Dr. Gore" personafix BTL or downloaded one too many medical drama sims and who now want to play doctor that you need to fear, not to mention the ones that are simply fronts for Tamanous or ghoulish meal dens.
- Black Mamba

Secondly, there are entirely legal enhancements and procedures for which people, for whatever reason, do not want any records floating around. Here in the San Fernando Valley, for instance, there is a whole industry where people want to be as beautiful as possible, but where there is perversely a taboo against getting cosmetic work done. There aren't any laws against having the body made more appealing, or its natural muscular hypertrophy enhanced. But it would hurt business if trollish starlets admitted to having their ridges sanded or their breasts reinforced. Likewise, athletes can get expelled from competition by stodgy committees if they admit to muscle doping. So they do it through channels that don't leave a data trail.

Then there are the patients who simply can't be seen in an official hospital at all. From the genetic experiment on the run to the man whose bones contain unlicensed weaponry, many people simply can't allow a public facility to conduct even a routine checkup on them. These people need shadow clinics just to get dental cleanings. On top of that, your occasional non-metahuman sapient sometimes needs medical care too—and there aren't many hospitals (or even veterinary clinics) that will treat a sasquatch, a shapeshifter, or someone infected by HMMVV.

Some procedures are themselves illegal in whatever country you happen to be in. So if you need a person's memory wiped, or the information extracted from a severed head's datalock, you may need a shadow clinic. Some procedures are completely legal, but records of them could be used in an investigation. Patients swarming with an invasion of alarm-transmitting taggant nanites would be well advised to get treatment from someone like me rather than from a licensed hospital that communicates suspicious treatments to the authorities.

Finally, recycling makes good business sense. The factories that make cybereyes would much rather start with even a partially complete set than start from scratch. I can get perhaps as much as 10 percent off the cost of new eyes by sending an old pair back to be refit. They don't ask where I get them, and I don't say—but let's just say that 5 percent of the cost is enough to keep local razorguys in pulse and novacoke. Bioware implants are a different story: cultured ware has no resale value except as ghoulish chow, but the type Owen stuff can be turned around for full price, which means that it can be sold off to a medical warehouse for perhaps 40 percent of retail with no unpleasant questions at all.

- What's type Owen?
- 2XL
- It's what most generic bioware is. Every metahuman cell has a number of protein markers that mark it as a foreign body in another metahuman. People with type A blood recognize the B proteins as foreign and vice versa. Some people have less of these proteins; people with type O blood have neither A nor B proteins. Owen Whiting of Alpena, Michigan has none of these proteins. His cells are completely non-allergenic, and have been being cultivated and modified since 2034. He's the Henrietta Lacks of the 21st century.
- Butch

SEASOURCE SEARCH QUERY: HENRIETTA LACKS

Henrietta Lacks (1920–1951) died of cervical cancer at John Hopkins University Hospital in Baltimore. Her cervical cancer survived and was cultivated (without her knowledge or permission) throughout the world for research purposes. These cancer cells survived for almost a hundred years after their host had perished, and in total far exceeded Henrietta's mass while she was alive. The so-called "HeLa" cancer cells were a useful world standard in biology until 2044, when the bioterrorist group Allezforce Micro destroyed the cells with ritual sorcery.

- Type Owen organs are often abbreviated to just O, and have been cultivated to such an extent over the last 30 years that viable O type tissue worldwide outmasses Mr. Whiting by tens of thousands of times. To those familiar with them, the O-type organs have a distinctive look and taste.
- Hannibelle

Of course, with all this discussion of what a shadow clinic *can* do, I think it's equally important to talk about what a shadow clinic *can't* do. A shadow clinic generally has a pretty small staff, so any large number of patients is going to have to form a line if they want treatment. While a minor hospital that you may not have heard of might have 350 beds, a shadow clinic usually has more like 6. Another thing that a shadow clinic can't do is draw attention to itself. I don't have a nuclear deterrent, so it's fairly difficult for my personal organization to stare down a governmental or corporate security squad. Facilities like mine are very useful to corporations, so they try to stay ignorant of the dealings of shadow clinics, but it falls to the shadow clinic to keep push from coming to shove. Don't expect a clinic to protect you if you've led a security force to their door.

THE PATH OF BEAR

Author: Dr. Jacqueline Diamonds, Uploaded By: Butch

- Dr. Diamonds is a member of the Bear Doctor Society, a group of magicians who practice medicine at a community hospital in Salish lands.
- Butch

Magical healing is a very misunderstood process. People see the phenomenal speed with which magic can heal an injury, and are shocked to discover that healing extensive injuries can often be a long and painful process. While one can address some injuries and disease with the use of powerful sorcery, such curative workings have distinct limits. Any further Awakened medical care has to go through the slow process of enhancing the body's own natural healing capabilities. A healing spell might close a bullet hole in under thirty seconds, but that doesn't mean that two spells can close two wounds in a minute.

Magical healing techniques in use around the world are as varied as the traditions that employ them. From prayer and song to the application of magical unguents, herbal lore, and specially placed needles, the guidance of the spirits takes many forms. Whether the magician is channeling the spirits through hot stones, herbal tinctures, or her own hands, long term magical healing always requires that the magician touch the patient.

- Dr. Diamonds is showing her own tradition-bias. Not everyone considers the rebalancing of natural forces to require the guidance of spirits. When I coat a coin in medicine to use for koo'kchall, there are no spirits involved.
- Jimmy No
- Of course there are. How would the aura of the patient be re-oriented to good health if the great spirits didn't approve?
- Lyran

Another common misconception about magical healing techniques is that they can be applied without the intervention of a magician. This is especially dangerous, as many magical healing techniques are harmful or even deadly when used without the guidance of the spirits. A taoist sorcerer may be able to extend your life with potions made from cinnabar, but the rest of us have to deal with the fact that the mercury content is quite toxic.

- I second that. Properly enchanted and administered by a magician, so-called "immortality potions" and similar arcane substances can make someone healthier and stronger. But the knock-offs they sell on street corners in Hong Kong are poison, even though they are chemically the same.
- Nephrine

Magical healing operates on different principles from the scientific approaches, and is most effective when used alongside mundane methodologies. It is a sad fact that even many medical practitioners are unaware of the benefits that magic and technology bring to the table. Billions of nuyen are wasted every year attempting to use magic and technology to perform miracles that they simply cannot achieve.

- In places like the UCAS, where magical healing is barely tolerated, charlatans flourish. In more enlightened places where the scientific and thaumaturgical medical systems are more integrated, misuse of both is curtailed.
- Elijah

ORGANLEGGING AND BODY SNATCHING

Posted By: Butch

- Unsurprisingly none of my contacts wanted to come forward and help out, so you'll have to make do with my second hand knowledge.
- Butch

Medical technology has advanced to the point where organ and limb transplant is more commonplace than ever. With the improvements in transplant technology, the rates of organlegging and body snatching incidents have risen exponentially. Small-time criminals, chipheads, and drug addicts kidnap people and sell them to bodyshops for some quick nuyen; some even sell out their relatives, dead or dying, for spare parts. Why bury or cremate a body when you have cold, hard cash sitting on the slab?

- Isn't that a bit ... well, callous is one word.
- Ecotope
- Practical is another. I've traded in a fresh Azzie corpse more than once for some quick nuyen or as a down payment on an upgrade.
- Kane

Cornering this multi-million nuyen underworld industry are some pretty nasty figures. **Tamanous** is the most feared organlegging organization on the block. They deal in body parts, and they don't seem to care how they obtain them or who they obtain them from. There have been stories of the group's members taking horrifying actions you wouldn't see in the worst slasher trid. They're said to operate body farms, but they're equally comfortable stripping organs and limbs from the dead, dying, and perfectly healthy—it's all the same to them. They even make a nice sideline reselling second-hand cybertech.

A person in need with the right connections or the right bank account can request what they need from Tamanous and can expect results faster than most hospitals and medical facilities are capable of providing. These guys aren't for the faint of heart.

- You'd think that most of the folks who deal with Tamanous would be bottom feeders, right? Amoral scum that don't bat at an eye at kidnapping and selling children, murdering squatters for parts, or dealing with ghouls? Think again. Tamanous has more than a few clients and business partners that come from society's "elite." That's because Tamanous has resources that people don't dare to think of. Fetus farms. Clone banks. Heck, they purchase hacked medical records in bulk just so they can look for people who are a match for any needs they have, to abduct when the need arises. They wouldn't have services like this if there weren't people out there who pay for them—and I'm not just talking street docs and shadow clinics. I'm talking rich people. Rich people with twisted needs, like designer children. Rich people with sick fetishes like keeping a private stock of clones (of someone else) they can live out their fantasies with. Corp execs who need a batch of test subjects that all have the same metatype and blood type. If you think Tamanous is bad, well, their clients are usually worse.
- Hannibelle

There are other operations of the sort, like the **Body Bank** in Europe and the **Black Crysanthemum Triad** in Asia, but none are as extensive, as well-connected, and seemingly impervious to law-enforcement as Tamanous. As I've mentioned before, smaller players also dabble in the field, and more than a few street docs have found uses for clients who've died on the operating table.

- It's not just Tamanous either. I heard about this family in Des Moines, where the mother died from natural causes and they wanted to give her a proper funeral. The hospital she died in says they'll take care of the details, for a nominal charge of course, and recommends cremation over casket burial. After some discussion, the family agrees. Frankly, it's just cheaper. Anyway, the hospital presents the sealed casket so they can offer their final good-byes, and then they watch as the casket roll into the furnace. Half-hour later, they get a nice little gilt urn with her ashes. Neat and tidy, right?

Wrong. Turns out that the hospital took the mother's body and resourced as much as they could out of it. Organs, blood, bones, whatever they could recycle for other purposes, they took. Didn't even compensate the family. The sealed casket held what little was left over. The family would never have been the wiser if someone hadn't fouled up the paperwork and asked for a signature.

I guess what I'm suggesting is that dead bodies have more monetary value than sentimental value. Some family members might be more valuable to their family dead than alive. It's crazy to think that's where society has gone.

- Turbo Bunny
- I can pop a scag on the street and drag his carcass to a ripperdoc or to the ghouls for a few hundred nuyen. Think I'm thinking about his family or his welfare? He's nothing but valuable meat to me.
- Kane

- Well, that's disturbing, but not surprising. Once upon a time people would donate whole blood and platelets for a little quick cash, but now, if you're down on your luck you can pop into your local street hack and sell parts for money. Replacement parts and cybernetics aren't all that expensive anymore. Of course, this also means that the sprawls are filled with chipheads missing assorted bits and pieces. When they have nothing else to sell to pay their dealers, they sell their bodies—literally.
- Butch

MEDTECH AND AUGMENTATION IN EVERYDAY LIFE

It stands to reason that the accelerating pace and availability of medical technologies are directly impacting our society, culture, and daily lives. Though specific body mod trends come and go with the shifting winds of pop culture, the fact is that body mods themselves are here to stay. It's no longer surprising to see people with obvious cybernetics, biosculpting, nanotats, or genemods on the street, not even the more extravagant varieties. And why should it be, when we also have metahumans, mages, and changelings walking the streets? Augmentation is now par for the course in many job markets, from office execs and media snoops to military types and construction workers. Skilled labor can now be bought for the price of a set of skillwires and some software. Environmental microadaptation allows people to live in areas once off limits, from deep undersea to high orbit. Good looks are no longer a qualification for getting into some social circles—they're a requirement. Debates still rage over natural vs. augmented athletic abilities, but in the shadows it's an ongoing arms race—you need better augmentations than your opponent to survive.



- Body mods aren't so accepted that they're invisible to sec types. I can't count how many types I've received extra attention for driving/walking/breathing-while-chromed.
- Hard Exit

Medical technologies cost, of course, and the newer/better/more exotic you get, the more it's going to cost. This situation is further establishing the divide between the haves and have-nots; the rich can afford just about any medical treatment or enhancement device they want, but the poor and SINless can't. Sure, street docs and shadow services help level the playing field a bit, but let's be blunt. The rich stay healthy and happy longer, and the poor generally get sick and die sooner. Your average citizen is only as healthy as he can afford to be.

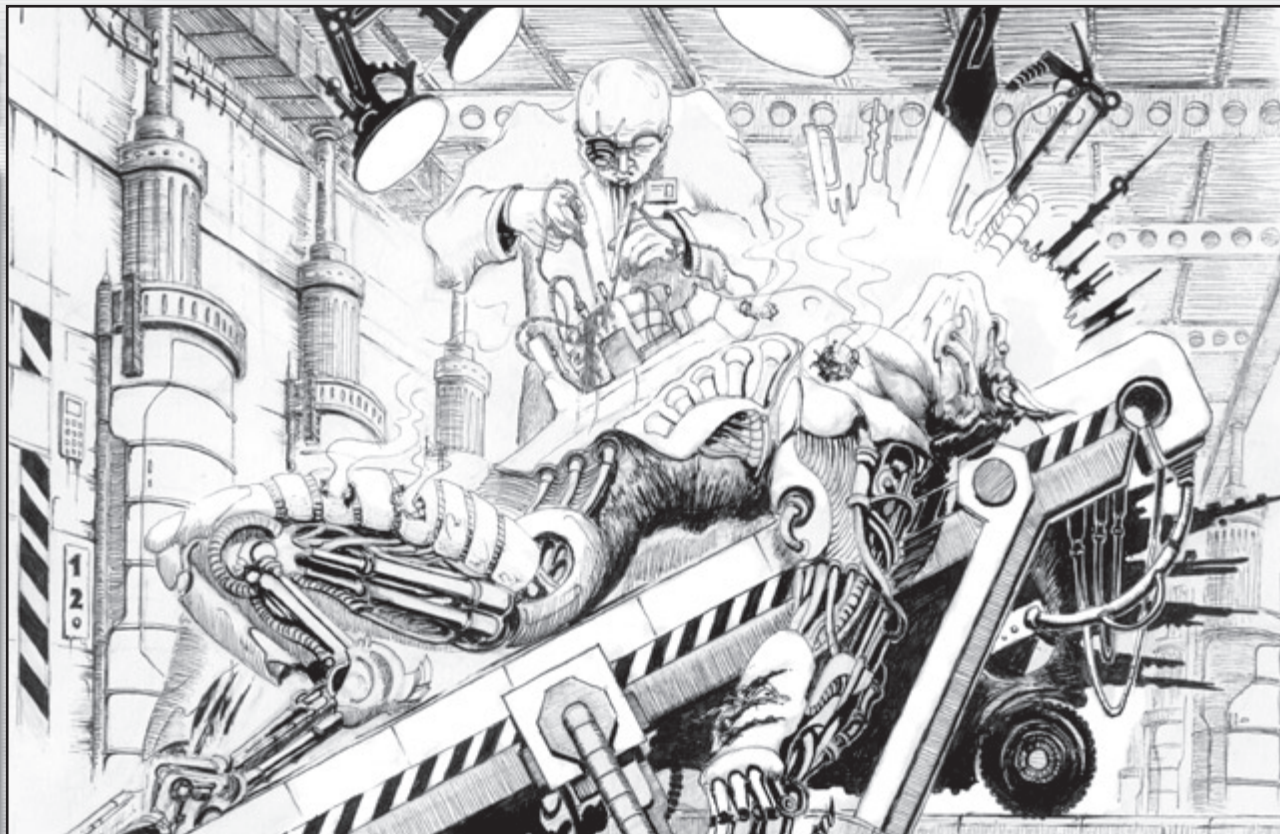
I'm no sociologist, though, I'm just calling it as I see it. Rather than ramble on like I know what I'm talking about, I thought I'd leave this section open for you folks to post your running commentary.

- One thing I've noticed: we've really gotten to the point where people don't mean much to each other. So many people have implants, bio-mods, or other changes that we're getting to the point where we're all artificial. Nothing is real any more. When skin color, eye color, hair color, and even body shapes can be changed at a whim, everyone can look like a model or a trid starlet without a lot of nuyen leaving their pockets. People look fake and people act fake. Not too many people are genuine any more, not just in looks but in attitude and demeanor. Honesty went out the door a long time ago. Cynical? Yeah. The twenty-first century is the Age of Cynicism.
- Sunshine
- It's not all bad. Technology really does let you "Be all that you can be!" like that UniOmni ad says. Having control over your own body doesn't necessarily mean you're transforming yourself into something "fake" just because it's something you're naturally not. Take transgendered people, who now have the ability to become the sex they feel they truly are. Medtech also grants us freedom from the arbitrary restrictions our natural bodies have placed on us. If I dream of being a world-class swimmer, why should I let the fact that I was born without gills or fins get in my way? Why should we be content, rather than making our own future?
- Plan 9
- That may be true to some extent, but it's not without its dangers, and I'm not speaking of the obvious ones. Augmentation can have profound and long term psychological consequences. Modifying your body changes who you are, how you perceive yourself, and how others interact with you. Sometimes this can be good, bolstering confidence or self-esteem, but it has also been known to lead to depression or other mental disorders and pathologies. The simple fact is that our understanding of mental states, cognitive processes, and mental health is still lagging behind other medical fields. In a sense, we're in a transition period, where augmentation of our bodies is becoming commonplace but a corresponding augmentation of our mental faculties is still unavailable.
- Nephrine

- That's true, but despite all the hype that "cyberpsychosis" gets in the press, the actual number of such incidents has been remarkably low. Sure, sociopathic tendencies can result from the sense of empowerment and invincibility that comes with extensive augmentations, just as heavy mods can spur an increased sense of alienation and detachment from everyday reality and metahumanity. The doctors and modshops know what to look for now, though, and mandatory counseling and drug treatments are now par for the course with certain levels of enhancement.

- Snopes
- On a related note, a new problem that's cropping up in psych journals is that of cyberdependency: people who have grown so dependent on their enhancements that it'd ruin their lives (so they say) to part with them. It's an off-shoot from the debate over AR and VR addiction.
- Kia
- Well, duh. I'd have to say I'm pretty "dependent" on my cybereyes, seeing as how I don't have my natural ones stored in a box somewhere. What a crock.
- Sounder
- I think the issue is more about the fanatical edge of the body-mod-fetish scene. It's not just that people become dependent on their augmentations, they become addicted to the enhancement process. They get all ecstatic over their latest bio-mod, but before long, they're jonesin' for their next upgrade. They aren't satisfied for any ol' bodyshop mod, either—they need the cool, exotic stuff. Eventually, they start taking more and more risks to get increasingly outlandish gear, until they end up dead on some sloppy street doc's slab or in the hands of Tamanous or their ilk.
- Kat o' Nine Tales
- You know what worries me more than sloppy street docs? Artificial ones. A lot of these medical procedures have become so routine that drones are now trusted to do them. Some advanced systems are even capable of performing complex surgical procedures.
- Riser
- I hear a couple even have a decent bedside manner programmed into them.
- Clockwork
- Has anyone heard anything about "genetic infusions?" From what I've heard, these are transient and unstable gene therapies that are injectable and don't require hospitalization. They're crude and dangerous but they're starting to show up in the NAN and UCAS. I've heard it's the Ghost Cartels moving this stuff into North American markets.
- 2XL
- Whoever it is, it isn't the Cartels. They're busy building up their exports of bioengineered awakened drugs for you unsavory gringos. Trade in BADs is good and getting better, to the point where relations with the Mob and Yaks are becoming strained in places as the drugs cut into their BTL profits.
- Marcos





INCOMING FEED.....



STITCHES AND SPARE PARTS.....

- Speaking of drugs, the new waves of designer drugs hitting the streets are impressive in their variety. The days of just having a few choices in recreational drugs are long gone. Now you can get drugs to give you anything from a light buzz to a full-blown psychotic hallucinogenic event. I hear there are more recreational drugs than there are antibiotics, though that doesn't surprise me. We metahumans have generally been more interested in what can destroy us than in what can help us.

- Goat Foot

- It's interesting to note not just the variety of drugs but the variance within the drugs themselves. Ever since Goblinization, the drug scene has been dealing with the problem that drugs affect different metatypes differently. You'd need a small mountain of Joyride to get the same buzz in a troll or a dwarf as a small packet would do for an average human. On the opposite end, how many elves and humans have OD'd on a single dose of a narcotic that was mixed to impact troll physiology? Dealers don't like having upset or dead customers, so now it's standard procedure for them to offer the same drug in different concentrations, each tailor-fit to a specific metatype. The troll dosages, of course, still cost more.

- Nephrine

- How can we be discussing medical technology without discussing what's always on our minds? That's right: sex! Medtech has created a new sexual revolution, especially for women. Women now have easy and complete control over their periods, and contraception methods are cheap, easy to obtain, and just as available for the boys. People who want to be pregnant can be pregnant, and people who don't want to be pregnant can terminate it immediately and painlessly. People who aren't in the mood can get in the mood, and people in the mood who want to get out of the mood can (though why would you?).

We even have the technology and medical assistance for people who want to have relations and relationships with people of different metatypes. There was a time when it was awkward or even nigh-impossible for a human and a troll to get together, or a dwarf and an elf, or whatever. Medical aids can now help you find the solution to whatever your heart, or body, desires.

- Kat o' Nine Tales

- Designer drugs, black clinics run by butchers, sex with trolls, and an artificial doc to cure my sick—is this a great world or what?

- Baka Dabora

GAME INFORMATION

Cybernetic, biotech, genetic, and nanotech augmentations to the metahuman form are the ultimate equalizers in the Sixth World. Unlike magical talent or technomantic ability, technological enhancements are available to anyone who can afford them. Despite the gap between the haves and have-nots, a growing percentage of the population already benefits from some form of implanted tech or gene therapy, particularly in developed countries.

THE AUGMENTED CHARACTER

Medical augmentations are available to all characters in *Shadowrun*, though there are drawbacks, particularly to those who also have Magic or Resonance attributes. The basic rules for body modifications are provided on pp. 63–64, *SR4*, and are elaborated on here.

Essence

The primary limitation on metahuman augmentation is Essence. This attribute represents the body's natural life force and holistic integrity. Extreme modifications or implantations push the body further and further from its natural state and closer to the mysterious threshold where the spirit seems to give up on the flesh.

As noted in *Cyberware and Bioware*, p. 84, *SR4*, Essence losses from cyberware and bioware are tracked separately. Only the higher of the two totals deducts from Essence in full, the other deducting only half. Of the new implants introduced in *Augmentation*, nanocybernetics add to the cyberware Essence loss total, while genetech modifications add to the bioware Essence loss total. Total Essence loss is only calculated after factoring in all modifications to the two subtotals.

The removal of an augmentation that costs Essence results in an “Essence hole” that does not normally regenerate, but may be filled with new implants. Detailed rules for the impact of upgrading, removing, or exchanging implants on Essence can be found in *Advanced Medtech*, p. 118.

Augmented Attribute Maximums

All new implants and gear presented in *Augmentation* are limited by the maximum augmented attribute values (as defined on p. 62, *SR4*) unless specifically noted otherwise.

BODY MODS AND SOCIAL INTERACTIONS

Though most of society has adapted to the constant presence of augmented individuals in their midst, not everyone has embraced it so open-mindedly. No one bats an eye at datajacks, cyberarms, or cybereyes any more, but certain conservative, anti-tech, religious, or simply sheltered characters may view heavily augmented characters with distaste, revulsion, or fear. Likewise, certain extreme modifications—frilly raptor cyberlegs, fluorescent pink bioluminescent skin, or an extra set of cybereyes in the back of the head, for example—are likely to raise eyebrows even in circles accustomed to enhancements. At the gamemaster's discretion, a dice pool modifier of –1 to –2 can be applied to Social Skill Tests in circumstances in which body modification is a factor. In the case of Intimidation Tests, an equal +1 or +2 dice pool modifier might apply.

Note that in some social groups, extreme bio-mod expressions may not only be accepted, but idolized. In these circumstances, a remarkably modified character may receive a +1 to +2 dice pool bonus on his Social Skill Tests.

NEW POSITIVE QUALITIES

The following new positive qualities are available to augmented characters in *Shadowrun, Fourth Edition*. As with all qualities, groups should consider their impact on the game before allowing them into play. See *Qualities*, p. 77, *SR4*.

Biocompatibility

Cost: 10 BP

Something about the character's body is exceptionally accepting of either bioware or cyberware implants (choose one). Not only are the implants not rejected, but they seamlessly fit within the body, having less impact on its holistic integrity. In game terms, the Essence Cost of implants of the particular chosen type are reduced by 10 percent. This reduction does not apply to genetech. This quality may only be taken once.

Genecrafting

Cost: 5 BP

This character was genetically modified before he was born. Since it is much easier to modify the genome at the embryonic stage than to rewrite the genetic code of a mature body, genetic modifications performed *in utero* are quicker and cheaper than gene therapy treatments performed on an adult. In game terms, any genetic enhancements (see p. 72) purchased at character creation are reduced in Cost by 20 percent.

Genetic Heritage

Cost: 10 BP

Though genetweaking isn't yet widespread, the technology to successfully modify a metahuman genome has been around for well over three decades. It is thus possible that children have inherited genetically-modified genes from one or both progenitors. Such an inheritance means the character can start play with *one* genetic modification (see p. 72) for free. Such characters also possess an unusually high tolerance to the introduction of foreign code into their genome. As a result, the nuyen costs of transgenic genetic enhancements for the character are reduced by 20 percent.

Type O System

Cost: 30 BP

Though exceptionally rare, a few lucky people in the world have completely non-allergenic “type O” cells, meaning that they can give organ transplants to just about anyone with little chance of rejection. While the character cannot accept second-hand bioware at all, their essential cell line is already cultivated as the generic standard throughout the world. Off the rack, basic bioware is considered delta grade for purposes of interacting with a type O body (i.e., reduce Essence Costs by half, though nuyen prices remain the same). Their bodies are also filled with universally transplantable organs, so maybe they shouldn't brag too much about this talent.

Wild Card Nano Prototype

Cost: 30 BP

At some point in the past, the character either volunteered to field test prototype nanoware or became an unwitting guinea pig for experimental nanotech. Fortunately for him, the prototype is a state-of-the-art hard nanite system that can be reprogrammed (see *Reprogramming Hard Nanites*, p. 107) with great ease. Wild



Card is a Rating 3 non-specialized nanoware system (p. 108) that can be reprogrammed to perform as any internal nanoware systems also at Rating 3 (circumventing the normal limitations on reprogramming hard nanites). If the character with this quality does not possess a nanohive, the Wild Card nanoware will degrade as normal. If the character possesses a nanohive, Wild Card counts as one nanoware system it must support.

NEW NEGATIVE QUALITIES

These negative qualities are also available to augmented characters in *SR4* at the gamemaster's discretion.

Augmentation Addict

Bonus: 10 BP

Some people can't help themselves and become addicted to the power rush and extraordinary abilities granted by cyberware and bioware implants or other augmentations. This is typically rooted in a sense of dissatisfaction with their natural bodies and/or abilities. Such individuals develop a dangerous urge to seek out better and more interesting body modifications.

Augmentation Addiction is psychologically similar to a Moderate drug addiction (see p. 248, *SR4*). Over time, the character will grow increasingly unhappy with enhancements he already has, especially if they fail him in any significant way. He may suffer mood swings or sudden outbursts about his inadequacies. The gamemaster can periodically call for a Willpower + Logic (1) Test, though the character will suffer a -4 dice pool modifier. If the character fails the test, he must immediately work to obtain a new modification that is either better or more exotic than any previous existing mods. If the character cannot afford a new augmentation, he will beg, borrow, or steal to get it—even from friends. The gamemaster might also call for the test whenever the character comes into contact with a wiz new piece of gear, such as seeing it in a bodyshop catalog or witnessing an implant's performance in someone else.

Biosystem Overstress

Bonus: 10 BP

Some people never really adjust to bioware implants, even if these are cultured. In such individuals, the constant biostress and the metabolic resources tied up lead to slower healing times and faster onset of fatigue. Characters with this quality double the normal interval for Healing Tests (p. 242, *SR4*) and half the base period before Fatigue sets in (p. 155, *SR4*).

This quality is only available to characters with at least two bioware implants.

Buggy 'Ware

Bonus: 5 BP per rating (max rating 4)

Some implants never should have gotten past quality control. A few develop inexplicable glitches after implantation. Others are just second hand and past their expiry date. Still others seem to bring their users bad luck. All these are grouped under Buggy 'Ware. This quality increases the chance of glitches whenever that implant is being actively used or modifies a test. Reduce the number of 1's needed to get a glitch (p. 55, *SR4*) by one per rating.

A specific implant must be specified as the Buggy 'Ware. The gamemaster is the final arbiter of whether this quality can or cannot be applied to any given implant. It is suggested that the quality only be applied to implants that contribute to or modify dice pools.

OPTIONAL RULE: DEVELOPING CYBERPSYCHOSIS

Though cyberpsychosis and related mental disorders are rare in *Shadowrun*, the gamemaster may wish to employ them as a risk any character takes with excessive augmentation. Under this rule, any characters whose Essence falls below a certain point become more susceptible to the feelings of detachment, indifference, aloofness, and general lack of empathy. In some cases, this can feed sociopathic tendencies and even lead to a psychotic break. This type of mental disorder often manifests as disproportionate reactions, violent behavior, and homicidal urges.

In game terms, the gamemaster may require characters whose Essence falls under 1 to make a successful Intuition + Willpower (1) Test every time their Essence is decreased further. If they fail, they automatically gain the Cyberpsychosis negative quality (see below). A critical glitch on this test could double the normal effects of the Cyberpsychosis quality.

If the implant is removed, this negative quality must be bought off at a cost of (10 x Rating) Karma (see p. 265, *SR4*).

Cyberpsychosis

Bonus: 10 BP

Only characters with an exceptionally low Essence attribute (1 or less) should be allowed this quality. Individuals suffering from this condition become detached and distanced from the world around them. They seem to experience social interactions and strong emotions one step removed and are often subject to sociopathic or psychotic impulses. A character inflicted with cyberpsychosis incurs a -2 dice pool modifier to all Social Skill Tests. Furthermore, if the test glitches, the character acts inappropriately or violently overreacts. If the test produces a critical glitch, the character suffers a psychotic break and becomes temporarily insane—immediately becoming an NPC until such time as the gamemaster deems he has received sufficient psychiatric treatment and has returned to a semblance of normalcy.

Gene Freak

Bonus: 10 BP

The Sixth World is full of things that endanger normal genome expression, including Awakened dangers, environmental pollution, unpredictable mutagenics, and secret experimentation. Gene freaks are the extreme result of such genetic tampering, whether hereditary or accidental. Characters with this quality suffer an unexpected genetic disorder that manifests as ugly and visceral physical deformities. The character suffers a -3 dice pool modifier on all Social Skill Tests not done via the Matrix and a +2 dice pool modifier for all Intimidation Tests. The character and gamemaster should negotiate to decide on a deformity that is suitably negative. Gene freak characters might also have developed personality quirks or aggressive behavior from years of social rejection.

Urgent Message...

STITCHES AND SPARE PARTS

High-Maintenance Implant

Bonus: 5 BP

This option is only available to characters who possess at least one cyberware implant. A particular implant possessed by that character suffers from some sort of unfixable glitch that requires constant vigilance and maintenance and periodically causes it to fail and shut down. The high-maintenance implant should be one that has an active function, rather than some sort of passive support (ie. wired reflexes but not bone lacing). If the character does not take the time to perform maintenance on a weekly basis, requiring a Cybertechnology + Logic (8, 1 hour) Test, the implant will simply cease to function. At the gamemaster's discretion, the implant may also fail at other inopportune times, such as rolling a glitch on any test affected by the implant.

If the implant is removed, this negative quality must be bought off at a cost of 10 Karma (see p. 265, *SR4*).

Implant-Induced Immune Deficiency

Bonus: 10 BP

Cyberware and bioware users sometimes suffer from a number of health problems as the natural balance of their metabolisms is thrown off by modified organs and systems. The demands of their augmented biologies and the body's continuous attempts to adjust to the implants can lead to decreased immunity to pathogens, poisons, and other compounds. Characters with this quality suffer a dice pool modifier of -2 on all Body Tests to resist the effects of diseases, drugs, toxins, and other compounds (including Physical Addiction Tests and Disease Resistance Tests). This quality is only available to characters with bioware or cyberware implants and an Essence of 5 or less.

Mystery Mod Noise

Bonus: 5 BP

This option is only available to characters who possess at least one cyberware implant. A particular implant possessed by that character emits an intermittent and subtle but annoying noise even when not in active use, akin to a metallic whir, high-pitched whine, gas-like bubbling, or something similar. A particular implant must be chosen to suffer from the condition and should be an externally-accessible implant with moving parts, like a cyberarm. The noise may not be eliminated, no matter the repairs or lubrication efforts, though it may be muffled with heavy clothing or Silence spells. The gamemaster determines when the irritating noise is active. The noise applies a +2 dice pool modifier to any Hearing Perception Tests made against the character.

If the implant is removed, this negative quality must be bought off at a cost of 10 Karma (see p. 265, *SR4*).

Nano Intolerance

Bonus: 5 BP

Some immune systems react more strongly than others to nanoware. This may be because of some DNA quirk that makes protein-matching imperfect or simply the immune system's hypersensitivity. Regardless, the character's natural immune system and metabolism rid themselves of free-floating nanoware much faster than usual. Nanoware systems in nano-intolerant characters degrade 1 rating point every 4 days (instead of a week). This quality may not be taken at character creation by characters who possess nanohives. If the character has a nanohive implanted, the quality must be bought off at the cost of 10 Karma (see p. 265, *SR4*).

TWEAKING THE RULES

The following suggestions are provided for game-masters to tweak the rules relating to augmentation and medtech according to their particular style of play.

Slower Healing

The basic *Shadowrun* rules opt for fast recovery times from injury in the interest of getting characters back in the game. Though not always realistic for characters with higher-than-norm attributes, speedy recovery can also be chalked up to advances in medical technology. If, however, your group prefers characters to feel their pain and for those who get taken down to stay down, we suggest adopting one of the following two options. This will result in characters being down for much longer periods of time and makes timely intervention with first aid and magical healing into a major concern rather than a short-term benefit.

- Apply the character's standard damage modifiers for his current wound level to the Stun and Physical Damage Healing Tests (p. 242, *SR4*). If the character's dice pool is reduced to zero, he will be unable to heal without medical assistance (see *Using Medicine*, p. 242, and *Medkits and Autodocs*, p. 243, *SR4*).
- Use only Body rather than Body x 2 for Physical Damage Healing Tests (p. 242, *SR4*).

Second-Hand Implants

Rather than simply having a set Essence Cost increase, second-hand cyberware and bioware can be made more of a gamble in one of two ways:

- Second-hand implants have the standard Essence Cost of unused implants. After implantation, however, the recipient must make a Body + Edge (4) Test. The final Essence Cost of the implant is increased by 0.1 for each hit he falls short of the threshold. Should this throw the character's Essence below 0, he may well die on the operating table.
- All second-hand implants comes with the Buggy 'Ware negative quality (p. 21).

Power Supplies

As noted in *A Note On Power* (p. 33), *SR4* makes the assumption that technical advances allow for almost unlimited power supplies for cybernetics and cyberware accessories. For a grittier campaign, you could limit certain high-power -consumption devices (ie, hydraulic jacks, certain cyberlimb plug-ins, etc.) to a set number of uses or set period of battery life, before time must be taken to recharge the batteries.

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Temporal Lobe Epilepsy

Bonus: 10 BP

A fortunately rare problem among highly-cybered individuals, temporal lobe epilepsy with complications (TLE-x) is a chronic degenerative condition believed to be caused by neurological stress caused by excessive cyber implantation. Characters who take this quality start play with the TLE-x disease described on p. 132. If the character ever undergoes corrective gene therapy or brain surgery to correct the condition, the quality must be bought off at the cost of 20 Karma (see p. 265, *SR4*).

Urgent Message...



TWEAKING THE RULES (CONT.)

Implant Maintenance

For ease of play and to deter unnecessary bookkeeping, Augmentation does not feature any rules requiring characters with implants to undergo regular maintenance or checkups. If you want a game where enhancement comes with consequences, however, characters with body modifications must pay extra lifestyle costs equal to 1% of their total implant costs each month. A character with 10,000¥ worth of implants, for example, must pay a 100¥ upkeep fee each month. Gamemasters might also wish to make the character roleplay regular visits and checkups, perhaps requiring a street doc contact as well.

If a character fails to maintain his implants, consequences should apply. For instance, the Buggy 'Ware negative quality could be applied until the character gets his required checkup.

Genetech and the Awakened

Groups wishing to differentiate and limit the options available to Awakened characters may chose to implement the following optional rule. Tampering with the genome can have unforeseen consequences, particularly when changes may affect little understood genes such as those that express the magus factor. Since the mechanism underlying such metagenes is far from being understood, Awakened characters undergoing genetic treatments always risk interference of metagenes with the procedure that might lead to Magic loss or even death. To prevent this from happening, gene designers and technicians have to be particularly cautious when dealing with an Awakened genome. To reflect this, increase the costs of all gene therapies for the character by 50 percent and double any Essence costs. Characters who opt not to apply the increased costs must succeed in a Edge (1) Test or lose one point of Magic attribute.

Genetech and Essence

Augmentation assumes that genetic treatments that restore the baseline metahuman genome or enhance existing elements do not cost Essence. On the other hand transgenic treatments, involving the implanting of foreign DNA, result in Essence loss. Current nuyen costs are balanced to reflect the lack of Essence loss.

Alternatively, the gamemaster may rule that all "major" genetic treatments (i.e., any genetic treatment that significantly changes the DNA) carries an Essence cost. It will be up to the gamemaster to determine specific Essence costs in this case, but note that nuyen costs should consequently be adjusted down.

Limiting Nanoware

If a gamemaster wishes to put further limitations on nanoware, we suggest the following rule. A metahuman's physiology can only support four active nanoware systems at the same time (though more may be inactive in a nanohive). Physiological limits on blood volume, coupled with the problems of heat and waste produced by active nanites disallow more. For each active nanoware system after the first four, reduce the effective rating of *all* active nanoware by 2 until one is removed (through normal degradation or by being recalled to a nanohive). Inactive nanoware (such as any system currently unused or dormant in a nanohive) does not count towards this limit.

Limiting Nanohives

The basic rules for nanoware allow nanohives to indefinitely sustain nanoware systems without further degradation (see p. 112). If you wish to limit nanoware further, simply change it so that nanohives slow the standard degradation of nanoware systems from 1 rating point per week to 1 rating point per month.

Limiting Nanocybernetics

As another nanotech limitation, all nanocybernetics could only be available as betaware or deltaware, under the explanation that advanced nanotechnology is only available at such high grades. Essence and nuyen costs should be adjusted accordingly.

Nanotechnology and Technomancers

Similar to the optional limits of genetech on the Awakened, groups may chose to limit the effects of nanotech on technomancers with the following optional rule. Much like meddling with the genome can prove dangerous, introducing nanoware into a technomancer's organism risks interfering and disrupting his bio-electrical field and hamper his abilities. To prevent this from happening, nano-docs must be particularly cautious when dealing with technomancer physiology. To reflect this, increase the costs of all nanoware and nanocybernetics for the technomancer by 50 percent and double any Essence costs. Characters who opt not to apply the increased costs must succeed in a Edge (1) Test or lose one point of Resonance attribute.

Breaking Up Medicine

As it stands, the Medicine skill covers a wide range of difficult skills. One option is to instead make Medicine into a skill group, with each of the specializations treated as separate skills in that group.

Symbionts For Everyone

The Essence Costs for symbionts could be dropped entirely, allowing anyone to have a "special friend" without damaging their body.

Cosmetic Surgery

To reflect the ability of cosmetic surgeons to beautify people, any net hits above the threshold on a Cosmetic Surgery Test may grant a +1 increase to Charisma. The maximum bonus obtainable from cosmetic surgery would be +3.

Injecting Enhanced Proteins

Much like people have been known to inject adrenal gland extract, it could be possible to create a temporary, injected boost from one of the enhanced protein exchange options. Use the same rules that apply to genetic infusions.

A Dangerous World

For a grimmer game, the severity of damage inflicted when using the optional Severe Wounds rule (p. 120) can be elevated in one of the following ways:

- Essence loss. Severe wounds don't just threaten the character's life, they also drain away life force. Each such wound inflicts between 0.1 and 1 Essence loss, as determined by the gamemaster.
- Negative qualities. Certain forms of trauma may inflict negative qualities upon the character, such as Infirm, Weak Immune System, or others of the gamemaster's devising.



Sometimes I wonder what I've done.

She called again this morning. I didn't answer. I didn't know what to say to her. Didn't know what I *could* say.

I'm drunk again. This room stinks like booze and stale cigarette smoke and machine oil. I sit on the edge of the bed, my hands spasming through my hair. Even my hair is fake. What kind of messed-up shit is that—fake hair? My fingers twitch involuntarily, and I turn down the reaction setting with a flick of my mind. I stare unblinkingly at the bottle on the table. That was one of the things that freaked her—the fact that I never blinked. I tried to make myself do it at first, but after awhile it didn't seem worth the effort anymore. If she really loved me, she'd have lived with it. The bitch should have—

Fuck.

There I go again.

It's happening again. It happens too often these days.

I fumble for the bottle and snatch it up. Dammit, I had to do it. I had to keep the edge. You fall behind the SOTA in this biz, you die. When you look at it that way, a little loss of humanity makes a lot of sense. You want to lose some of it, or all of it? It's not like I can quit. It's not like she didn't know she wasn't going to get the picket fence and the 2.5 kids with me.

Still, I thought we were in it for the long haul. She was my center—the only one I could go to when things got too bad and this fucking business started to smother me. She was the one who talked me down when my brain wouldn't stop whirling. She argued hard against me taking this next step, didn't understand why I had to. She tried, but I saw her eyes when she looked at me. People think that because I've got all this chrome in me, I don't feel. I'm not some fucking cyberzombie. I'm still human.

More than human. Or maybe less.

Either way, I'd give it all up to go back two days in time. Before that idiot flirted with her in the bar. Before I—

My teeth grit. The red haze hits again. The bottle shatters into shards as my hand—my chrome-and-circuitry, state-of-the-art technological wonder of a hand—clenches around it. Without even thinking I adjust my pain receptors to dull the sting, watching idly as blood pools in my palm and drips onto the broken glass on the floor. Watching like it's somebody else's hand.

Which, up until a couple of weeks ago, it was. How much of me used to belong to somebody else? How much of me is even still the guy she used to care about? At least the blood's still mine—for now.

The comm buzzes again. It's her.

I don't answer.



LIVE WIRE

Posted By: Butch

Chrome, cybernetics, the wire, the hard edge. There are a dozen names for it on the street. Catalogs and enhancement shops prosaically call it cyberware. Specialists tend to agree the term encompasses the various technological and mechanical implants, modifications and enhancements a person can have grafted or added to their body—though that’s an artificial compartmentalization since micro-sized implants are effectively nanotechnology and many pieces of cyber integrate either nano- or biotech components. Nonetheless, for the purposes of this piece, that definition will do.

Cybernetics as a field has been around for a hundred years; artificial organs, prosthetics, and therapeutic implants of various kinds were in use back in the previous century. Granted, they were bulky, inefficient, and fragile by today’s standards, but they paved the way for a revolution in personal enhancement. Cyberlimbs, cybereyes, cyberears, datajacks, wired reflexes, and internal commlinks are all direct descendents of those early prosthetics and aids.

While nanoware and genecrafting now loom on the horizon as the new state-of-the-art enhancement technologies, it’s easy to forget that there’s been fifty-odd years of research and development poured into cyberware since Leonora Bartoli got the first functional cyberlimb. Cyber-mods and implants have never been cheaper and easier to obtain and install—though they remain more invasive than comparable non-cyber augmentations, no other technology offers as diverse a catalog of prosthetic, functional, and aesthetic augmentations and upgrades.

- Don’t make light of the invasive nature of cyberware. If you have a teammate who slings magic, their holistic voodoo isn’t going to work as well on you as it would on a more cyber-free body. All those electronic gizmos and chrome-work wreak havoc on your spirit-being, making it harder to heal the bio among the tech.
- Axis Mundi
- On the other hand, investing in the best cyberware you can afford might just allow you to not get popped, which means you won’t need to worry about getting healed.
- Sticks
- Everyone in the biz gets hit eventually, Sticks. Even if it’s just a scratch, every runner has a scar or two. Those that don’t are raw rookies, liars, or have very good cosmetic surgeons.
- Fatima

WHY CYBER?

We all know that over the last decade and a half, bioware has stolen a lot of cyberware’s wow factor. Cyber may be tougher, but bio regenerates and is less invasive. Plus, new genetweaks and nanoware are hitting the market every day, and their prices are coming down slowly but steadily. So you’re probably asking yourself, why the hell would you want to stick to outdated chrome?

Well, raw razorboys and security ubermensch may think it’s démodé, but as any veteran of the streets will tell you, cyberware can be just as lethal as any bioware or nanoboost. In fact, the prevailing attitude towards chrome is an edge to many. Far

too many greenhorns put their faith in the latest and greatest, underestimating the value of “old tech.” Big mistake. Cyberware is reliable, cheap, and lethal. No other type of augmentation on the market can beat cybernetics for sheer variety and versatility—and that right there can be as dangerous as a monofilament whip in the right hands. So, pundits claiming “cyberware is outdated” are pretty much talking out of their asses. Sure, cyberware isn’t the first choice for pure physical enhancements as it once was, but that’s only half the story. If you have a hankering to become a stronger, faster, better you, go get some bioware or genemodding done—that is, if you aren’t on a budget and you have the time to waste on the treatments.

Let Auntie Butch break the advantages down for you:

Cost Effectiveness

First, most legal (and many illegal) cyberware implants are dirt cheap to obtain and are a great value for the money. Even when there’s a biotech or nanotech alternative available, it’s sure to cost twice as much as the cyber option. Let’s be realistic, nuyen is still very much a factor for most people in our line of work. If you’re a gillette coming up from the streets, a ganger with ambitions, or a low ranking made-man, plopping down 20k of your hard-earned cash on a bioimplant or nanoware isn’t an option—especially when chrome will set you back only half as much.

- Cyberware is the ultimate leveler on the streets. There are more gangers out there sporting new and second-hand cyber than ever before. Used to be it was only slumming corporate brats and wire-head gangs that could afford the stuff. Nowadays, every other punk seems to be decked out with chrome. It’s not just low-lifes, either—everyone trying to make a name for themselves in entertainment and newsbiz has an implant or two. There’s simply no other choice out there.
- Kat o’ Nine Tales
- Cost also matters to the corps. If it’s cheap to chrome up their workforce, guaranteeing some percentage increase in efficiency, you can bet they’ll do it. Plunking skillwires into some uneducated lout and paying him standard laborer wages is a lot cheaper than paying someone who spent years and a small fortune getting a complete education. These days, a lot of corporate employment contracts call for mandatory implantation (make sure you read that fine print!), and getting a desk job isn’t easy if you lack the corp’s requisite bizware.
- Cosmo
- What’s even suckier is when you get downsized ... and the corp wants its implants back.
- Baka Dabora

Resilience

Second, cyberware is rugged and reliable, since it was the first kind of augmentation on the market and has been around ever since. Unlike fledgling developments in genetech and revolutionary bio-implants, most cyberware is based on tried and tested designs, the result of continuous development iterations over various decades. While biotech is essentially augmented flesh and



bone, cyber uses well-tested plastic derivatives, polymers and other myomers, ceramics and non-corrosive (as well as nonmagnetic and even non-conductive) alloys, insulated microfiberoptic lines, micro-electronics, microcomputers, micro-optical processors, and microgyroscopes and servos—you can't get harder than that.

- The doc has a point there. Try grabbing the barrel of a red-hot gun with your nice cloned hand. It'll make ya wish it had a cyberlimb's integral sensory cut-off.
- Hard Exit

Unique Functionality

Third, cyberware still does things that no other type of 'ware can do. Cyberware excels in everything that integrates networking, simsense technology, or indeed any kind of artificial feedback or display. Only cybernetic skillwires allow you to plug in skills you've never even had before, and only a cyberware image link can invoke a building's floorplans into virtual existence on command. Disregarding technomancers for the moment, we're a long way from seeing the biotech equivalent of a cranial commlink, radio, or trid-recorder. Cyberware also excels in other areas: if you want multi-functionality and multi-system integration in a single implant, cyber is still the only way to go. It is not unusual for off-the-shelf cybereyes to allow for more than two dozen option packages and stackable functions. Tricked-out cybereyes, cyberears, augmented cyberlimbs, and anything simsense related are just the most obvious examples; modular cyberlimbs and integrated cybersuites also open a universe of options.

- Methinks the doc is laying it on a little thick—it is her bread and butter after all—but she does make a point. State of the art may have moved on, but cyberware is far from being a niche thing. It's still a multi-billion nuyen business that none of the big corps ignore.
- The Smiling Bandit

Downsides

I won't sugar coat it, cyberware has its drawbacks, and there are plenty—for most people though, they don't outweigh the advantages I've outlined above.

Availability

The foremost issue to keep in mind when it comes to getting cyberware is actually procuring it. The NuYou outlet down at the ACHE will have 10 brands of cybereyes on the shelf, but nary a set of betaware eyes (or wired reflexes for that matter). Most bodyshops and quite a few street docs keep the most common basic and alpha-grade 'ware in stock, or otherwise can arrange for their delivery within a couple of days, but anything else is complicated. Betaware is becoming more common, but successful implantation requires better facilities and skilled technicians than most franchise clinics and back-alley bodyshops possess—meaning you need to go looking for high-end specialist clinics like Nightengale's or Executive Body Enhancements. Some well-connected cyberdocs, such as myself, will have the contacts to arrange for betaware, but it might take a few days. Deltaware is still very much the province of closed corporate facilities and black clinics. I'd say there's no more than six or seven of them in North America, and only a couple of those are indy operations.

SEASOURCE SEARCH

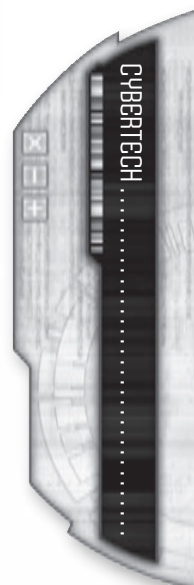
Seattle Metroplex Bodyshops

Name	Rating	
Executive Body Enhancements	••••	2 Directory hits
Humana Hospital	••••	No address listed
Body+Tech	••••	2 Directory hits
Nightengale's Body Parts	••••	2 Directory hits
Red Star Clinics	••••	2 Directory hits
Spin Shop	••••	1 Directory hit
Universal Upgrades	••••	1 Directory hit
Body Pagoda	•••	2 Directory hits
CrashCart Clinics	•••	1 Directory hit
DocWagon Clinics	•••	6 Directory hits
MetaType	•••	1 Directory hit
A Whole New You	••	8 Directory hits
Billing's Medical Services	••	1 Directory hit
Cyborgs'R'Us	••	4 Directory hits
Dr. Bob's Quickstitch Clinic	••	1 Directory hit
Body Mall	•	No address listed
NuYou	•	3 Directory hits

- It goes without saying that not all the stuff that finds its way to black market streetdocs is production line rejects or goodies that fell off the back of a truck. Sometimes the corps arrange for select docs to field test prototypes and experimental stuff.
- The Smiling Bandit
- Both the Seattle and Los Angeles branches of Exec Body have been known to turn a blind eye to credentials and licenses for the right amount. Don't know if the practice extends to their Asian affiliates. I also heard over the grapevine that Spin Shops and DocWagon clinics perform implantation for runners as bonuses for work done for their parent companies.
- Glitch

The second big issue with cyberware is that a lot of cybernetic enhancements are either strictly controlled or outright illegal. Many governments have problems with people who sport certain types of cybergear, and there are a number of ways to detect, limit, or neutralize individuals with such gear. Basic cyberware by nature isn't very inconspicuous and this can be a problem. Your cyberdoc should be able to warn you of any legal problems—and, if he's anywhere as well-connected as I am, he might even be able to sort out an appropriate license for your alias for a negligible fee.

- Depending on the jurisdiction, I've found licenses can be either dead easy to find or you could be jumping through bureaucratic hoops for weeks with nothing to show for it. Having the right connections is a must. The corner of the world you're in makes all the



difference, of course. The CAS, Britain, Switzerland, and Japan are pretty anal about granting cyberware licenses to non-corporate, non-military, and non-law enforcement types. Getting papers in the UCAS, Hong Kong, and parts of Europe depends more on the local official than the law (and how much you've greased their palms).

- Traveler Jones
- I hear you. Most of the NAN tend to be a pain license-wise, but Pueblo has become a lot more lenient the last few years.
- Mika
- If you ever need ironclad fake licenses, they're not too hard to come by, if you've got the money. If you haven't got a line on one, I'll link you up—for a small fee of course.
- 2XL

Vulnerability

Almost everything today can be accessed via a wireless link, even (or especially) your precious cyber implants. While the wifi-capability of some implants is a no-brainer (your fiberoptic hair being controlled via your PAN or the smartlinked articulated weapon-arm sending targeting data directly to your image link), the connectivity of others—usually more “passive” implants—is not. This fact, combined with the constant threat of hackers, has led to some concerns about cyberware being a security risk, especially within the rather paranoid military or security organizations (and, of course, the shadows).

So why use it in the first place? Simple: wireless-accessible cyberware make sense. Cyberware corporations constantly release firmware updates for your cyber toys, fixing minor bugs and upgrading your systems, so that the smartlink in your three-year-old cybereyes still functions with the latest generation of wifi Predator pistols. When your internal air tank suddenly goes on the fritz, it can notify you via your PAN so you can get it repaired, rather than finding out the hard way that it's broken when you're suddenly relying on it to breathe 6 meters underwater. Your street doc can use your 'ware's wireless links to pull up an instant status report or run diagnostics when you head in for a regular check-up, saving time and money—and possibly saving you the visit entirely if you allow him to check remotely. Let's not forget the convenience of mentally triggering and controlling your cyberlimb accessories via commlink, rather than doing it manually. So while closing down the wireless connectivity of your implants (or other equipment) may sound like a good idea, not knowing the actual status of your 'ware or not being able to access certain functions when you need it can be a pain.

In truth, this vulnerability is somewhat exaggerated. The signal strength of cyberware is intentionally low, so an intruder either needs to be in close proximity or needs to hack into your PAN first and then access your 'ware from there. So if you practice good Matrix security (pump that firewall and load up the IC!), you reduce the risks. A lot of implants don't have active wireless controls of any sort anyway, relying on built-in RFID sensor tags to supervise implant integrity and handle remote diagnostics. So depending on your implants, the most you may have to fear from hackers is a violation of your medical privacy.

Nevertheless, it pays to play it safe. Almost every corporation advises its customers to update their cyberware's soft- and firm-

ware only within controlled environments (like your firewalled home-PAN), and the standard procedure for security personnel is to allow wireless access to their cyberware only within strictly controlled and sealed-off areas (like the building's security center), disabling the wireless links when they leave these areas.

Invasiveness

The metahuman body, for all that it is a marvel of construction and performance, didn't evolve to naturally accept electromechanical enhancements. Implanting cyberware tampers with the balance of this delicate machine by adding artificial organs and otherwise modifying the original to run differently. Such alterations inevitably take a toll in the form of an incremental amount of physical system-wide stress and, friends tell me, damage to the body's spiritual integrity. This is particularly relevant since there seems to be a limit to what you can implant before the body and mind begins to shutdown—this threshold seems to be somehow tied to the body's spiritual well-being.

This aspect of cyberware implantation is particularly relevant for the magically active. The disruptive nature of cyberware seems to compromise their ability to wield magic to the point where installing too much 'ware can eventually strip their magic completely.

- Which is why most chopdocs have Awakened clients sign liability waivers in case something goes wrong on the operating table.
- Winterhawk
- Those that bother to warn their clients. Many a back-street surgeon has neglected to warn his bright-eyed wickid client of the risks before going under the knife. Blissfully ignorant, they go ahead and implant wires that screw their Talent for ever.
- Haze

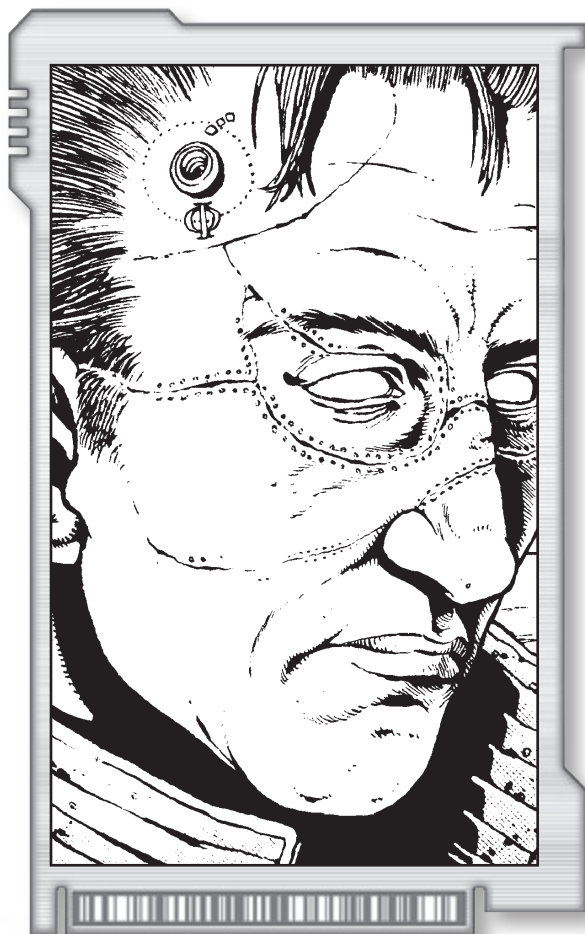
Ultimately, it boils down to the simple truth that the more metal you plug into your body, the farther you get from the metahuman norm. Unfortunately, cyberware is so alien in nature to metahuman metabolisms that it is harder on the body than any equivalent form of technological enhancement.

- Your body's spiritual and holistic wholeness is compromised every time you introduce some foreign device into your body—regardless of whether it is cyberware or bioware. Your energies are knocked out of balance by the change to the fundamental nature of the body. There is a limit to how much of your holistic essence you can compromise in this manner; a point beyond which your mind and spirit cannot sustain you. Nothing metahuman survives beyond that threshold.
- Axis Mundi
- You're forgetting cybermancy.
- Johnny No
- No, I'm not.
- Axis Mundi

Detachment

So what of the old wives' tales about how the more machine you jack into yourself, the less metahuman you are? The tall tales





of cyberware leading to psychosis and sociopathic tendencies? Truth is, to some degree, everyone who installs cyberware experiences some feelings of detachment and dissociation—but if it's any consolation, it happens to some extent with bioware implants too. The stories themselves are generally exaggerated. If they weren't, I'd be out of business.

The reasons for this side effect are complex, but I'll try to keep things simple. Part of it is neurological, and part is psychological, and it's rooted in the fact that while a neural interface translates digital data into sensory stimuli your mind can understand, the actual information carried is inherently *different*.

If you've ever had cybereyes, you know what I'm talking about. Cybereyes are essentially trid cameras. Fully wireless-enabled, tricked-out, low-light, image-linked cameras—but cameras nonetheless. The colors, contrast, resolution, aliasing, and depth perception are all different from what you would experience through your natural eyes. Many people find that this difference changes their experience of things, distances them from what they see, making it seem slightly unreal.

- There's also the slight sense of a change in your body that comes with an implant. A lot of these sensations are subtle, but they add up. The slight loss of flexibility in a limb with an implant, the slight temperature difference between a piece of 'ware and the rest of your body, or the way synthetic skin doesn't stretch as well. Or simply the sense that there's something in your body that isn't supposed to be.

Not only does it make you feel a bit different, it sometimes makes you feel like you're not even yourself.

- Hard Exit

The same phenomenon applies to all sensations conveyed from cyberware. The nanosensors on your cyberhand will tell you something is hot or humid to the touch, but the way the brain experiences this information is different. Some implants provide you with a completely new sense—ultrasound, for example—which your brain has to be trained to understand. It goes beyond sensory stuff too. On a subconscious level, your brain *knows* when you're chipping a skillsoft that it is processing “artificial” knowhow, that it shouldn't be able to do these things. Figure in the fact that cyber allows sensations to be toggled on and off and the experience may seem even less real.

- Same goes for reaction augs and wires. When you become used to reacting at those speeds, everybody else seems impossibly sluggish and tediously slow-moving. More than just grating, it can make you cocky and feed a sociopathic sense of superiority. Not to mention the jitters and jumpiness from always being on edge.

- Nephrine

- Fits though. Always kinda freaked me that some people will voluntarily have their natural limbs and organs lopped off and replaced by chrome. Not the prosthetics and replacement stuff, but cyberenhancement. As far as I'm concerned, it takes a special kind of crazy. At least bioware is flesh and blood, cabrón.

- Marcos

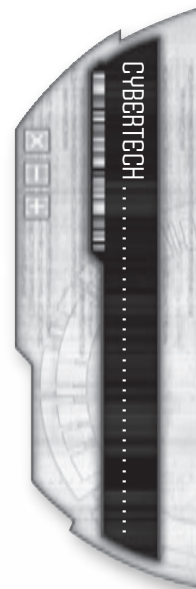
- It's not crazy to the growing cyberfetish culture. Some people get all sorts of implants for kicks and style—some pretty extreme. The underground club scenes in Europe and East Asia are full of them—mostly disaffected teens and would-be thugs, but quite a few low-level corporate types too. In an age when we can alter our bodies at whim, some people jump at the chance to be different.

- Kat o' Nine tales

Some subjects report a sense of numbness and detachment from the world around them, as if they were experiencing life one step removed. Psychologists call it a “buffer state” between reality and your experience of it. Apparently it's incremental: the more cyber you install, the greater the distance between the two and the more likely a fragile psyche might grow depressed, develop neuroses, or in extreme cases suffer a psychotic break or lasting psychosis. In most people, this is a minor inconvenience, easily ignored. In a rare few, especially those with excessive cyberware or chipping high-end skillsofts, this sometimes develops into a sense of alienation and detachment that impacts a person's demeanor and outlook on life, making them seem cold and inhuman.

- Some of the disassociation may come from people's responses to heavily-cybered individuals. Having a conversation with someone who never blinks can be unnerving, not to mention if his eyes glow with blacklight intensity and his body happens to be built like a refrigerator. Someone sporting that much 'ware can't help but pick up on feelings of alienation from the people around them.

- Baka Dabora



- Better believe cyberpsychosis is real. Remember the “Century Stalker” that had Hong Kong in an uproar, before the technomancer hype buried it on page 10? Turns out he was a veteran of the shadows by the name of Li Xiau who went off his rocker after upgrading his cyberears. Took to torturing his victims to try to regain some “feeling” by hearing them scream.

- Ma’Fan

- Butch is focusing exclusively on the scientific explanation to “cyberpsychosis.” There are others. Many specialists believe the effect is caused by a corrosion of the link between the spirit and the body. This impacts the individual’s aura strength, natural empathy, and emotiveness.

- Johnny No

BEHIND THE ’WARE

Can’t have a piece on ’ware without some brand placement. Seriously, though, it’s important to know who makes what and what to expect for your money. Here’s a brief rundown of the top gadgeteers in the cyber industry today. Pay attention, and you might pick up a hint or two on who might be signing your next paycheck.

CHROME KINGS

The following corps stand at the top of the heap and dabble in pretty much every field of cybertech from component production to implantation to research and development. Their products and services are benchmarks for all other megacorps and control a significant portion of the global marketplace.

Evo

Despite the profound metamorphosis this company has gone through since the Crash, it has done nothing to curb the megacorporation’s dominance of the field. When it comes to cybertechnology, Evo does it all: it is the number one worldwide producer and distributor of cyberlimbs; its products run the gamut of cyberware types and are tailored to all metatypes; and its R&D division is second to none in beta- and deltaware design. Crashcart, Evo’s healthcare subsidiary, offers affordable implantation surgeries.

As industry leader, Evo is the target to a disproportionate amount of shadow ops, extractions, and industrial espionage. Rumor has it that, as a result, Evo’s star cybertechnicians and R&D labs are hidden away as inconspicuous departments of bigger facilities.

NeoNET

As befits the heirs of one of the original cybertech innovators, Fuchi Industrial Electronics, NeoNET has risen inexorably to the top rung of cybertech corps in the past few years. Their deck is stacked with Erika’s microtronics and wireless networking technology, Transys Neuronet’s expertise in headware, Matrix and neural cybernetics, and Novatech’s own knowhow, production and distribution base, and IPO-powered cash injection. On top of that, Richard Villiers named the great dragon Celedyr director of R&D for the world’s number two corporation.

NeoNET pioneered the introduction of wireless functionality in its products and has spearheaded innovations in wi-fi and

network-enabling cybertech, expanding and diversifying its traditional focus on neural enhancements and Matrixware.

Renraku

Navigating safely through the corporation’s many troubles in recent years, Renraku’s cybertechnology division has continued to be one of the Japanacorp’s primary moneymakers. Renraku has diversified its interests and competes with NeoNET in many of its core fields—even stealing the show in certain Asian markets from what I hear. Renraku currently leads the field in skillwires and skillsofts. A significant portion of the division’s profits come from supply of microtronic and optical components to other corps. You’ll find Renraku chipsets, relays, and components in some of the best pieces of ’ware on the market.

Renraku’s multitude of problems in the past few years have resulted in a mid-term crisis for the corp. Its focus on restoring stability and profitability left the door open to a lot of talent poaching, and the corp is now suffering from what can only be described as a braindrain. Look for Renraku’s hierarchy to do some headhunting of its own soon.

Universal Omnitech

What’s to say? Few corps have fared better than Universal Omnitech over the past decade. Though it’s become increasingly involved in exploring and exploiting other forms of augmentation, cybertechnology remains one of the corporation’s primary focuses, and it has interests in nearly every aspect of the industry. Its cybersurgeons, medical facilities, and training programs are still unrivalled, as are many of its original cyberware designs.

RISING STARS AND TRENDSETTERS

Not as dominant as the big boys above, between them the following corps have introduced some of the most ground-breaking concepts and fads in cyberware design in the past decade. To a large degree, they’re responsible for the continued innovation and popularity of this field.

DocWagon

No other corp comes close to the sheer volume of work DocWagon does in cyberware implantation, repair, upgrading, and replacement. Most of its ubiquitous clinics have access to beta-grade implants, as well as basic and alphaware. It’s rumored they might be one of the few corps with delta clinics hidden away somewhere. In recent years, DocWagon has invested in developing its own line of cyberlimbs and bodyware in an effort to remain competitive with the big boys—in particular, Evo’s Crashcart.

Mitsuhama Computer Technologies

Mitsuhama’s cybernetic products have always been known for their cutting-edge specifications, reliability, and quality without compromising affordability. Any cyberware MCT manufactures is subject to the same stringent and efficient processes and guidelines the corporation applies to its computer, drone, and robotics divisions. In fact, it has been the cross-pollination between these different areas of interest that have led to MCT’s major claim to fame in recent years—the introduction of modular cyberlimbs and plug-ins.



Spinrad Industries

Rising from the ashes of obscurity during the past decade, SpIn has restored much of its past glory. Inspired by its founder, the original cyberman playboy Johnny Spinrad, this A-level corp was one of the first to invest heavily in cybernetics as an enhancement technology. After a difficult patch in the '40s and '50s, SpIn has made a major comeback and keeps rocking the market with stylish and flashy innovations that range from sportswear to military cybersuites. As one of the first corps to introduce integrated cybersuites, SpIn possesses some of the most popular non-megacorp produced suites out there. Among their diverse offerings, Spin Shop bodyshops even provide custom-designed cybersuites under the Soroyama brand—though I hear the waiting list is a mile long.

Zeiss (AG Chemie)

Less of an innovator and more of a trendsetter, this A-corporation has consistently fared well in the cyberoptics and media-related augmentation market otherwise dominated by megacorp giants. Its designs invariably have a unique flare and are both stylish and functional. Zeiss also boasts a number of strategic alliances with other corporations and functions as a specialized research consultant company for numerous smaller companies dabbling in its areas of expertise.

SEASOURCE SEARCH

Executive Body Enhancements Online Catalog

Account X5633-01101
:: Third Quarter 2070
:: Top 10 Cybersuites

1. Shiawase's ExecutiveSuite Silverline
[<review specs>](#) - [<full sim trial>](#)
2. Zeiss SenseSation Livecaster
[<review specs>](#) - [<full sim trial>](#)
3. Shiawase's ExecutiveSuite Goldline
[<review specs>](#) - [<full sim trial>](#)
4. Renraku Digital Maestro
[<review specs>](#) - [<full sim trial>](#)
5. Mitsuhamas Spidersuite
[<review specs>](#) - [<full sim trial>](#)
6. Spln-X Olympian
[<review specs>](#) - [<full sim trial>](#)
7. Spln-X/Ferrari Omega
[<review specs>](#) - [<full sim trial>](#)
8. Saeder-Krupp Cyberlogician
[<review specs>](#) - [<full sim trial>](#)
9. Evo/Chara Urban Kshatriya
[<review specs>](#) - [<full sim trial>](#)
10. Chara/Genesis Urban Trekker
[<review specs>](#) - [<full sim trial>](#)

ADVANCED CYBERTECHNOLOGY RULES

Cyberware has come a long way since violinist Leonora Bartoli was successfully implanted with the first fully functional artificial limb back in 2019. Technology has developed to the point where eyes can be exchanged for superior and indistinguishable artificial implants, nerve tissue can be replaced with superconducting materials, and the latest generation commlinks can be implanted and hardwired to the brain.

By 2070, the advent of newer, sleeker, less-disruptive bioware and nanoware has led many people to believe the heyday of chrome has passed. Breakthroughs in the field of cyberotechnology have indeed been fewer and less impressive than in previous decades. A fact that can't be ignored, however, is that for more than three decades, corporations big and small have developed and marketed a bewildering variety of cybernetic implants ranging from the most utilitarian to the most exotic. Despite the slow in demand, the diversity and functionality of cyber implants on the market has never been so great. By and large, cyberware remains the cheaper and most accessible form of augmentation on the streets.

The following rules expand and diversify the cyberware options available to characters in *Shadowrun, Fourth Edition*.

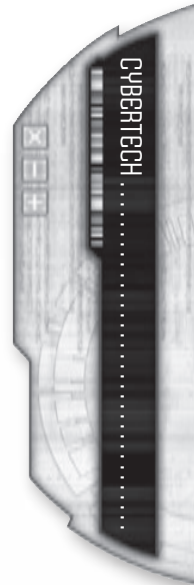
DNI AND WIRELESS FUNCTIONALITY

Most cyberware comes with an integral direct neural interface, allowing the user to mentally access and control the implant. This is the primary means of control for most cybernetics and requires the implant have a built-in computer. Obviously, not all implants require such interfaces. Some, such as dermal plating and bone-lacing, are passive augmentations and don't do much but make you tougher or stronger. Implants that don't require any sort of mental control still come equipped with RFID sensor tags as a matter of course.

Wireless functionality is complementary to direct neural control, allowing diagnostics checks, connection redundancy in case of damage to the neural relays, software/firmware updates, and non-invasive monitoring of the implant's performance. Almost all cyberware requires careful maintenance and regular check ups, and wireless connectivity is invariably cheaper than cutting someone open just to check on an implant. See *Wireless Connectivity*, p. 304, *SR4*.

Since most implants are computerized to some extent anyway, integrating inexpensive wireless technology is the default option given its usefulness in case the character is ever unconscious, suffering from extreme trauma, or simply wants to have a non-invasive checkup.

Nonetheless, for the paranoid, it is relatively easy to have a street doc disable or remove wireless links. Note, however, that this makes care and maintenance more difficult. Besides requiring invasive surgical procedures for inspection and maintenance, the gamemaster may apply a -1 to -3 dice pool modifier to any relevant tests the cyberdoc performs. Note that some implants may not need a complete wireless link—built-in RFID sensor tags can monitor the implant and report any problems. The gamemaster determines what implants/devices incorporate wireless links.



CYBERWARE TRIGGERS

Unless otherwise stated, cyberware that is capable of being activated or deactivated can be done so with a mental impulse. This is because the cyberware has been connected to the user's nervous system, so it can be used in the same way the user would move a finger or flex a muscle. Typically, when a cyberware device is installed, the user must spend some time adjusting to this new ability and will doubtlessly trigger the device accidentally a few times. Activating or deactivating cyberware is a Free Action.

If the gamemaster allows it, methods of manually triggering a cyberware device may also be used, such as a subdermal switch. Such triggers incur no extra cost. They can be both a drawback (if enemies find out about them) and an advantage (if friends know about them).

Most cyberware does not require additional trigger controls beyond those available through direct neural interface or wireless link. Some implants, however, come equipped with remote access or automatic triggers. These triggers are primarily used when the person has been implanted without his knowledge or against his will (with a cranial bomb, for example) when the implant requires activation only in certain situations regardless of whether the person is conscious or able to (an auto-injector containing an antidote, for example). Remote triggers and automatic triggers also incur no extra cost; they must simply be noted when purchased.

Remote Access

Remote triggers typically feature a passive, one-way wireless link that does not broadcast out until it is triggered by receiving a specific encrypted code. Since these wireless links remain silent until triggered, they are undetectable until active, and then they are treated as hidden nodes (see *PAN Modes*, p. 211, *SR4*).

Automatic Triggers

Automatic triggers can be linked to a normal or implanted biomonitor (see p. 329, *SR4* and p. 39), which will activate/deactivate the implant whenever the user's life signs exceed normal operating parameters. Alternately, the automatic trigger can be wirelessly linked to the character's PAN and programmed to trigger under specific circumstances: at a certain time, or after a certain period of time has elapsed.

SECOND-HAND CYBERWARE

Though more affordable than competing augmentation technologies, cyberware is still expensive for the average consumer. Consequently, there's a strong gray and black market for second-hand cyber available to the less discriminating customer. While most second-hand cyberware surfaces when former users upgrade implants and sell off their old 'ware, inevitably a lot of used cyberware finds its way to the market from more unsavory sources. Unfortunately, implantation problems tend to manifest more often with used cyberware than with new cyberware. Accordingly, most legal clinics shy away from used cyber, though backstreet shadowclinics and ripper docs will often have some in stock or know where to get hold of it.



Only standard and alpha-grade cyberware is available as second-hand cyberware. Beta- and deltaware implants are too custom-tailored and modified to be fitted to anyone other than the person they were originally designed for. After locating a source for your second hand cyberware, apply the Essence Cost, Availability, and Cost modifiers as noted on the table below to the appropriate implant. Implantation is conducted as normal (see *Installing/Repairing Cyberware and Bioware*, p. 126).

Nicola is looking for some high-class muscle replacement for her character Clutterbone, but since she's short on nuyen, she decides to defy the bad reputation of second-hand cyberware and tries to acquire a Rating 2 alphaware muscle replacement implant.

The base Essence cost of the implant would be 1.92 (the original 2 Essence cost for Rating 2 muscle replacement x 0.8 for alphaware grade x 1.2 for the second-hand state of the implant), while the Availability would be 9R (10R for the original implant, -1 for being second-hand) and the cost 10,000¥ (10,000¥ x 2 x 0.5).

Implant	Essence Cost Multiplier	Availability Modifier	Cost Multiplier
Second-hand Cyberware	1.2	-1	0.5



Cyberlimb Sensory Cut-off

All modern cyberlimbs come with sensory feedback systems that attempt to reproduce tactile impressions such as texture, warmth, softness, humidity, etc. This is accomplished using a combination of micro-pressure sensors, nano-receptors, hair-fine analyzers, and processing software that composites the feedback into recognizable human sensations. In older models, these systems were often only embedded in cyberhands.

Cutting off sensory feedback from such systems, when it's inconvenient or when the cyberlimb is damaged or undergoing repairs, is simply a question of giving the built-in processor a mental command over the neural link or a PAN-connection.

Switching off feedback from a cyberlimb allows characters to perform actions with that cyberlimb which would normally induce distracting or painful feedback, such as getting mauled by a hellhound, putting a hand into a vat of acid, punching a wall, etc. In these circumstances, the gamemaster should allow the character to ignore wound modifiers from damage applied directly to that cyberlimb for as long as the sensory feedback system is turned off. In the case of damage applied to the character in general, not specifically to that cyberlimb, the character can ignore a box of Physical damage per sensory-disconnected full cyberlimb (not partial limbs) solely for the purpose of calculating wound modifiers. Note that neither of these options actually prevents damage, it just allows the character to turn off some of the pain.

Cyberlimbs have sensory feedback for a reason, of course, and turning that input off makes the cyberlimb clumsy and difficult to use. At the gamemaster's discretion, he may apply a -1 to -3 modifier to the character's actions involving that limb.

A NOTE ON POWER

Thanks to modern technology, the need to use battery packs or external power sources to operate cyberware is a thing of the past. With the exception of energy weapons and (at the gamemaster's discretion) certain high-energy-consumption devices, augmented characters do not need to worry about powering their implants, including such 'wares as cyberlimbs and reaction enhancers. Many implants simply use the body's own natural neural bioelectricity, sometimes storing and redistributing this power using superconductive and macroconductive materials. Other implants use micropower technologies such as thermoelectric generators that rely on the temperature differences between the body and its environment and nanoscale generators that convert power from the mechanical energy of movement.

Urgent Message...

COSMETIC CYBERWARE

The term "cosmetic cyberware" refers to two different kinds of cyberware. The most common variety of cosmetic cyberware is *cosmetic cyberware modification* and refers to the further customization of cyberware implants by altering their off-the-shelf shape, color, surface texture, location, and sometimes even minor functions of these implants, either for pure aesthetics or to adapt them to specialized needs.

Cosmetic cyberware implants are equivalent to cosmetic surgery with the exception that these implants are used to alter the look of the patient, most often since the same results cannot be achieved by using biological tissue or bioware implants.

Cosmetic Cyberware Modifications

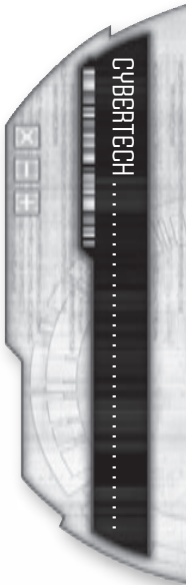
Cosmetic cyberware modifications include anything that alters the appearance, shape, or color of another piece of cyberware and does not affect the Essence Cost or Capacity of the modified implant. If, however, the location and/or function of the implant is also altered by these modifications, the Essence Costs and Capacity requirements may also be affected.

Depending upon the exact nature of the modification, the Availability of the implant is increased by +2 to +12, while the implant's cost increases by 200¥ to 10,000¥. The more exotic a cyberware-implant and/or the modification is, the higher the Availability and Cost increment usually becomes. If very expensive and rare materials are incorporated into the modification, both Availability and Cost may even exceed the above numbers. Since the possible modifications are almost limitless, the final decision regarding the Availability and Cost modifications is up to the gamemaster—though *most* modifications should fall into the range given above.

Cyberglad: Technically a misnomer, a cyberglad is more of an implanted reservoir/auto-injector than an artificial gland. Cyberglads are embedded within other cyber implants such as cyberlimbs, dermal sheathing, dermal plating, or sexual implants to release fluids and/or scents. They are useful in helping disguise cosmetic cyberlimbs by allowing them to sweat or smell, but can potentially be used for a variety of functions such as giving your synthskin a strawberry flavor, producing a toxin from your cyberbreasts, or coating a retractable spur with snake venom. If implanted with a weapon, the user may have the cyberglad coat the weapon's surface with the contained compound when it is extracted or fired. If the coated weapon is a melee weapon, the dose is considered spent after the first successful strike.

The cyberglad reservoir must be refilled through a concealed external port. Each cyberglad can only store and release one compound and must be embedded within another appropriate cyberware implant. At the gamemaster's discretion, a cyberglad may also be connected to chemical gland bioware (p. 68), allowing it to get a continuous refill from the bioware gland. Cyberglads may hold from 1 to 6 doses of the compound. The cost for the cyberglad does not include the compound's cost, which must be acquired separately.

Cyberlimb Casemod: This cosmetic modification may be made to any obvious cyberlimb. Rather than settling for the traditional gunmetal or smooth chrome surface, characters can personalize their cyberlimb's outer skin with an engraved, scaled, or otherwise stylized surface. Engraving patterns such as Celtic





INCOMING FEED.....

knotwork and tribal motifs are common, as are scales ranging in size and shape from tiny lizard scales to large “dragon scales” several centimeters in diameter. Other cyberlimb casing modifications include mirror surfaces, built-in lighting, UV-reactive surfaces, fish tanks, and transparent plasteel so you can see the inner workings. This cosmetic cyberware modification does not alter any stats other than Availability and Cost of the modified original limb.

Engraved Datajack: The thin visible rim of the datajack, necessary to anchor the implant securely to the user’s head, is decorated with a small inscription. Geometric patterns, tribal symbols, haikus (often in Japanese kanji-signs), or quotes from popular sim and trid-movies are especially common.

Eyemods: Cybereyes with an altered general appearance are used by those who need something more individual than the normal cybereye’s changing eye-colors and patterns. Manga-style eyes, vertical eyes, insect-like compound eyes, protruding binocular sets, and other unusual cybereye shapes and designs are considered to be cosmetic cyberware modifications, though often these require surgical alterations to the eye-sockets as well.

Shaped Dermal Plating: While a stylization for surface texture and color is a common feature of dermal plating (see p. 333, *SR4*), some people prefer to go a step further. This modification includes stylized shaping (such as unusual ridges and bumps), custom-tailoring to the customer’s figure (for example, to emphasize abdominal and chest musculature), decorating the plates artistically (with corporate logos, hieroglyphs, tribal art, etc.), and so on.

Wet Sheath: The so called wet sheath is a dermal sheath variant (see *Dermal Sheath*, p. 40) that’s surface is modified to look shimmering wet and feel cool and slippery to the touch. This is achieved by adding a special polymer to the dermal coating that reduces friction and gives it a slight moist gleam. A wet sheath typically coats the user’s body except for the hands and feet and grants the normal bonuses granted by a dermal sheath. When tackling, wrestling with, or trying to grab hold of a wet-sheathed body, reduce the attacker’s dice pool by 1. A wet sheath modification may be added to a ruthenium polymer-coated dermal sheath (in which case any colors or images look somewhat wet), but cannot be combined with orthoskin, smart skin, or a chameleon modification.

Cosmetic Cyberware Implants

Cyberware implants classed as cosmetic have a primarily aesthetic function (rather than enhancement). They follow the standard rules for cyberware implantation.

Breast Implants: Popular with celebrities, wanna-bes, sex workers, and the transgendered, breast implants combine a special synthetic skin and inflatable reservoirs of pressurized gel that enable the recipient to alter the size and shape of their breasts. While most clients choose a natural skin for their breasts, cyber breasts with fur, scales or even completely artificial textures are popular in certain fetish scenes.

Fang Implants: Fang implants are enlarged teeth, anchored for support and sharpened for penetration. They are available in a wide variety of forms, most commonly canine or “vampire” fangs,

and may be implanted either as fixed teeth or extendable models. Ork-style tusks are also popular among ork poseurs following the Orxploitation craze of the past few years—these are typically non-retractable. While not designed for combat, fangs may prove handy in melee combat or as a surprise weapon, though they suffer -1 Reach. In these cases, characters must use the Exotic Melee Weapon: Fangs skill (see p. 112, *SR4*).

Fiberoptic Hair: The character's original hair is replaced with artificial fiberoptic hair. Fiberoptic hair can possess any color the customer desires and even switch colors and cascade in patterns preprogrammed or controlled via the character's PAN (ie. jet black hair with sparkling stars, smoothly flowing rainbow colors, or a mane that changes color to match the character's mood). Fiberoptic hair can also be electrostatically manipulated to flow and swirl as if alive—but doing so stresses the otherwise resilient hair, so that it must be replaced after about 3 months.

Fiberoptic hair is available in lengths between 0.6 cm and 1 meter. Individual strands are about double the width of normal hair. Fiberoptic hair of exceptional length or extravagant styling (ie. fiberoptic dreadlocks) may increase the costs at the gamemaster's discretion.

Horn Implants: Horn implants come in a wide variety of forms and sizes, from small devil horns or goat horns to larger troll and bull horns or even demon “spikes” implanted on the user's shoulders or back. While most horns come in pairs of two, there are also some kinds of horns that are implanted as single horns, like unicorn or rhinoceros horns. Horn implants are available either as fixed implants or in retractable versions. Horns may be used in melee combat, but the character must use the Exotic Melee Weapon: Horns skill (see p. 112, *SR4*), and they suffer from -1 Reach.

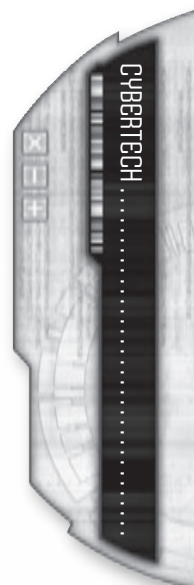
Penile Implant: This implant typically replaces the natural organ (or the former female plumbing in the case of transgendered customers) with an artificial composed of gel reservoirs and synthetic skin. The inflatable reservoirs can be mentally controlled by the user, making the implant quite popular with men with erectile dysfunctions. The testicles are not usually replaced but simply enveloped by the synthetic skin, preserving the customer's fertility. While the customer may choose from a wide variety of skin tones, sizes, and even textures and shapes, most show a marked tendency to choose a natural appearing replacement. It is unsurprising that these implants feature some of the most advanced neuro-sensory receptors available for cyberware implants.

Cosmetic Cyberware Modifications	Essence	Capacity	Availability	Cost
Cyberglad	0.1	—	+4	500¥ + 100¥ per extra dose (max. 6)*
Cyberlimb Casemod				
Full Arm/Leg	—	—	+2	+400¥
Lower Arm/Leg	—	—	+2	+300¥
Hand/Foot	—	—	+3	+250¥
Torso	—	—	+4	+1,200¥
Skull	—	—	+4	+1,000¥
Engraved Datajack	—	—	+2	+200¥
Eyemod	—	—	+3	+500¥
Shaped Dermal Plating	—	—	+5	+1,200¥
Wet Sheath	—	—	+2	+1,300¥

Cosmetic Cyberware Implants	Essence	Capacity	Availability	Cost
Breast Implants (pair)	0.25	[2]	4	3,000¥
Fang Implants (pair)	0.1	[1]	6	800¥
Extendable	0.15	[1]	8	1,200¥
Fiberoptic hair	0.1	[1]	—	450¥+
Horn Implants (pair)	0.15	[1]	8	1,500¥
Retractable	0.25	[1]	10	2,200¥
Penile Implant	0.25	[1]	5	3,000¥

Weapon	Reach	Damage	AP
Fang Implants	—	(STR ÷ 2)P	—
Horn Implants	—	(STR ÷ 2+1)P	—

* Does not include the costs of the drug/compound.



HEADWARE

Attention Coprocessor: While hardware that allows true multi-tasking is still out of reach, this frontal cortex and limbic system implant enhances the brain's ability to scan sensory input outside of the person's primary mental focus. This boosts the character's continuous partial attention—the overall awareness of several ongoing things at once, and the ability to shift concentration to what's most important without losing track of what's happening in the background. In game terms, the attention coprocessor adds its rating as a dice pool modifier to Perception Tests (note that it does not aid Astral or Matrix Perception Tests).

Data Filter: Upon activation, a data filter edits the flow of information from an individual's short- to long-term memory. The user will later be unable to recall anything that happened while the data filter was active. This device is popular with influential people who require the presence of aides or secretaries during confidential proceedings; such employees are fitted with a data filter that can be remotely triggered. The drawback to data filters is that the user is distracted while it is active and does not retain memories for more than a few minutes. Data filters are also common among "hosts" and "hostesses" of underworld bunraku parlors—the data filter ensures privacy, while a personafix chip turns the host(ess) into whomever the client desires.

A character with an activated data filter receives a -2 dice pool modifier to all Perception Tests and will not remember anything that happened while the filter was active. Data filters can be either remotely controlled via their user's PAN, or can be set to deactivate after a certain amount of time (most often chosen by users that manually activate their data filters, since they won't remember to turn it off on their own).

A data filter only prevents the memory retention received from the user's own senses. It does not affect the functioning of eye or ear recording units, simrigs, or other cyberware recording devices beyond the aforementioned modifier.

Encephalon: This expert-system microprocessor is hardwired directly into the user's cortex, augmenting its user's information-processing abilities and taking over minor and redundant "background" processes, enabling the user to concentrate on more important cognitive tasks, especially those involving processing AR or VR input. A Rating 1 encephalon applies a +1 dice

pool bonus to all Active Skill Tests using skills linked to Logic (the bonus does not apply to Logic-linked Knowledge skills). This bonus applies to Matrix tests when using these skills as well. A Rating 2 encephalon provides the same bonus and provides an additional +1 dice pool modifier to skill tests using skills from the Cracking and Electronics skill groups when using augmented or virtual reality.

Math SPU: This cranial subprocessor unit (SPU) amplifies the user's mathematical abilities by enhancing his ability to run mathematical calculations as background processes. As a side benefit, the subprocessor may also function as a stopwatch, alarm clock, and extremely accurate chronometer. A math SPU adds a +2 dice pool modifier to all tests focused on the user's mathematical abilities; as well as to any Electronic Warfare tests involving encoding or decoding.

Orientation System: An orientation system uses an internal GPS and miniaturized gyroscope (for those areas blocking GPS signals) to keep track of the character's location and motion. This implant is usually used in conjunction with mapsofts (see p. 321, *SR4*) to allow the character to easily navigate through the ever-changing urban jungles.

The orientation system also comes with integrated editing software that can be used to create and update maps. Even when no maps are available for a given area, the orientation system adds a +2 dice pool modifier to Navigation Tests. An orientation system requires an image link, head-up display, or some other optical display either implanted or connected via the character's PAN to properly display information.

Radar Sensor: This device emits ultrawideband and terahertz radar in short stepped-frequency pulses. An expert system analyzes the Doppler shift in the bounced signals and converts the information into a three-dimensional "map" that overlays (or replaces) the user's visual senses, similar in some ways to ultrasound. The advantage to the radar sensor is that it can "see" through walls and other materials, which appear as translucent. This system is excellent for detecting motion (even as slight as breathing), calculating exact distances, and allowing the character to visualize floorplans, locations of people, and placement of materials like weapons. It is unaffected by visual tricks like camouflage and Invisibility spells. It is unable to ascertain colors, lighting, or other visual features.



Headware	Essence	Capacity	Availability	Cost
Attention Coprocessor (Rating 1–3)	0.3	—	8	Rating x 3,000¥
Data Filter	0.2	—	12	2,500¥
Encephalon				
Rating 1	0.75	—	8	30,000¥
Rating 2	1.5	—	10	75,000¥
Math SPU	0.15	—	9	4,500¥
Orientation System	0.2	[1]	4	1,250¥
Radar Sensor (Rating 1–4)	0.3	[2]	12	Rating x 3,000¥
Simsense Booster	0.5	—	8	65,000¥
Voice Mask	0.1	—	7F	3,000¥



The radar sensor uses the same Visibility modifiers as ultrasound. It can penetrate its rating x 5 of cumulative barrier Structure ratings (see p. 157, *SR4*). For example, a Rating 2 radar sensor could “see through” two Structure rating 5 walls. It can be used to detect weapons and cyberware on a person in the same way as millimeter wave radar (p. 255, *SR4*). Radar sensor cyberware has an effective Signal rating of 2 for determining the sensor’s range. Radar sensors are vulnerable to jammers and jamming.

Simsense Booster: The implant incorporates a number of serial neural stimulators inserted into the areas of the user’s cortex that enhance the brain’s ability to process and respond to virtual reality (VR) stimuli. This reduces reaction times when operating in VR, be it using a hot or cold interface (see *VR Access Mode*, p. 228, *SR4*). Characters possessing a simsense booster boast an additional extra Initiative Pass when operating in VR (for a maximum of three Initiative Passes when operating in cold sim and four Initiative Passes when operating in hot sim).

Voice Mask: The voice mask is a downgraded version of the voice modulator (see p. 331, *SR4*). Unlike the voice modulator, this implant cannot increase the volume or frequency range of the character’s voice or record or mimic another person’s voice, but it creates a resonating frequency that totally distorts the user’s voice and makes it completely unrecognizable and unusable for any kind of voice identification.

EARWARE

Increased Sensitivity: This modification allows the user to hear sounds outside the range of normal metahuman hearing. The user can hear both ultrasonic, high-frequency sounds (including ultrasound emitters) and infrasonic, low-frequency noises. If combined with a voice modulator (p. 331, *SR4*) or vocal range enhancement bioware (p. 67), the user can clandestinely talk in a frequency too high or low for others to hear. The user can control what frequency ranges he listens to, turning them “on” and “off” at will.

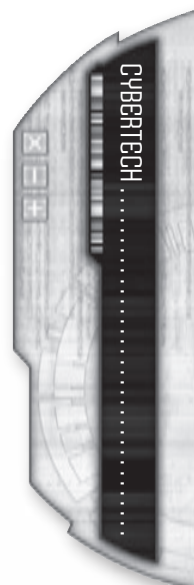
EYEWARE

Eyeband: An eyeband replaces the character’s eyes with a visor-like band of visual receptors that wraps around the head at eye height and grants 360 degree vision (if unobstructed by hair or headwear). Eyeband implantees normally require an adjustment period of a few weeks to become comfortable with their new field of vision. The human mind, however, isn’t designed to process this information without impacting equilibrium and sense of direction, and characters using an eyeband for 360-degree vision always suffer a –2 dice pool modifier to any tests the user makes when in motion. Fortunately, the exact amplitude of visual coverage is adjustable and may be limited to the normal human field of vision at will (nullifying the negative modifier). All vision subsystems available to cybereyes are available to eyebands. Like cybereyes, eyebands are available at different ratings.

Earware	Essence	Capacity	Availability	Cost
Increased Sensitivity	0.1	[1]	6	1,000¥

Eyeware	Essence	Capacity	Availability	Cost
Eyeband				
Rating 1	0.3	6	4	800¥
Rating 2	0.4	8	6	1,000¥
Rating 3	0.5	12	8	1,250¥
Eye Laser System	—	[3]	10	2,000¥
Eye Laser Designator	—	—	12R	1,000¥
Eye Laser Microphone (Rating 1–3)	—	—	12R	Rating x 500¥
Eye Laser Range Finder	—	—	10	1,000¥
Eye Tool Laser	—	[6]	10R	2,000¥
Eye Light System	0.1	[2]	6	750¥
Microscopic Vision	0.2	[3]	4	1,300¥
Single Cybereye				
Rating 1	0.1	2	—	300¥
Rating 2	0.15	4	4	450¥
Rating 3	0.2	6	6	600¥
Rating 4	0.25	8	8	900¥

Weapon	Damage	AP	Mode	Ammo
Eye Tool Laser	3P	–half	SS	10 (battery)





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Eye Light System: The eye light system consists of tiny but high-powered low-heat lights in the character's cybereyes that channel a tight, polarized beam outward along a path parallel to the optical center of the eyes. An eye light system illuminates a small area the character is looking at with a dim light (enough to illuminate about half a page of paper or to work within an electronic device or a control box). It also enables a character with low-light vision to see up to a distance of 25 meters even in total darkness. The tight beam and polarization minimize the beam's scatter, so the light can't be seen unless the user is staring directly at another person or this person is able to see the small spot illuminated by the eye light system.

Microscopic Vision: The microscopic vision subsystem functions as an implanted microscope, using tiny optical lenses to magnify the image of small objects near the user's eyes. The magnification factor of the microscopic vision may be continuously adjusted to magnify objects up to 1,000 times their normal size.

A character with microscopic vision may add a dice pool modifier of up to +2 to any Technical skill tests requiring the manipulation of small or micro sized objects (depending upon the circumstances and up to the gamemaster's decision).

To magnify an object, it should be within 15 centimeters of the character's eyes and the character should be able to steady his head (resting it upon his arm, leaning it against a wall or using a small support for his chin and forehead available for 50¥ at every optometrist) to prevent his vision from blurring.

Single Cybereye: The basic cybereye systems described on p. 332, *SR4*, replaces both of its recipient's eyes with cybernetics.

Some people, however, require only one of their eyes to be replaced with an artificial one; in these cases, single cybereyes are available. In stressful or highly active situations such as combat or running, single cybereye enhancements provide only half their usual bonuses (round down). Using single cybereye vision enhancements in less stressful situations—when the character can concentrate to discern the confusing visual data provided by two different kinds of vision or is easily able to close his natural eye—may be done without these penalties (at the gamemaster's discretion).

Single cybereyes may also be installed in other parts of the body, independent of the character's usual (cyber)eyes. These additional cybereyes can be implanted almost anywhere on a character's body. Popular locations include: the palm, back of the head or neck, in the middle of the forehead, or on the end of a tail (be it a balance tail, a tail grown through *SURGE*, or genetech modifications). Anytime these additional eyes are used in addition to the character's usual eyes, apply a -2 dice pool modifier to all tests due to the confusion and disorientation the mismatching images cause. Additional positive or negative modifications specific to the situation are left to the gamemaster.

Eye Laser System

This miniaturized laser system is only available for cybereyes, and may be upgraded with additional functionality with some minor hardware adjustments and software upgrades. The basic eye laser system features a "look-to-talk" system, allowing the user to communicate and transmit information via infrared laser to

another character with an eye laser system or external laser talk gear. The laser transmits through one eye and receives through the other. This communication system has the advantage of being discreet and, unlike wireless radio, is immune to jamming and interception. The lasers must be immobile and pointed towards each other, and at the gamemasters discretion, fog, smoke, or other conditions may affect the transmission. The eye laser may also be used to scan barcodes and other optical glyphs.

Eye laser systems have a functional Signal rating of 3 (400 meters).

Laser Designator: With this add-on, the eye laser can be used to mark a target with reflected laser light so that a weapon with an appropriate tracker/seeker head can home in on the reflected light. The spotter must make a successful ranged attack test using Exotic Ranged Weapon: Eye Laser skill to lock onto the target, and must maintain laser contact with the target until the indirect fire strikes the target; spotters suffer a -2 dice pool modifier to all other tests during this time. The spotter's net hits are added as extra dice to the indirect fire attack test.

Laser Microphone: The eye laser system can be used as a laser microphone (see p. 325, *SR4*) for surveillance purposes.

Laser Range Finder: The eye laser can be used as laser range finder (see p. 326, *SR4*).

Tool Laser: This system is devised to cut through thin objects, like cables, circuitry, normal window glass, or plastiboard, or to perform micro welds. Since its power and range are extremely limited, it is of only minimal use as a weapon. The micro-batteries only hold enough power for 10 focused shots or 10 minutes of continual cutting operation. The eye tool laser has a range of 1 meter (considered Short range), and when used as a weapon it requires the Exotic Ranged Weapon: Eye Laser skill.

BODYWARE

Auto-Injector: Auto-injectors are implanted devices that dispense medication or chemicals into the implantee's bloodstream. Auto-injectors are used in variety of fields, with medical utilization (diabetics who need regular insulin doses, psychiatric patients taking medication to ward off depression, or the elderly who require Alzheimer's medication) being the most common. Governments and corporations have also found diverse uses for auto-injectors: to ensure compliance, maintain control within prisons, or even enhance the combat effectiveness of soldiers.

There are two kinds of auto-injectors: reusable and one-shot. Reusable auto-injectors feature an external port through which they can be easily refilled and are usually implanted just below the skin's surface in a location offering convenient access. One-shot units are usually implanted deep inside their bearer's body, to increase the difficulty for detecting or removing these devices, and are commonly used to introduce harmful substances into an unwilling victim. Typical auto-injectors carry one dose, but versions exist that hold up to six doses. These doses may contain the same kind or any combination desired.

Almost all auto-injectors used to threaten or punish their bearer are triggered via a remote and/or automatic trigger (see *Remote Access*, p. 32). Most auto-injectors containing medical or enhancement drugs are either activated by automatic triggers linked to biomonitors or through a direct neural command. Examples of pharmaceuticals, drugs, or other chemical compounds that may

be used in auto-injectors can be found in the *Pharmaceuticals and Biomedicals* section (p. 134) of this book or the *Toxins* (p. 244) and *Drugs and Brainbenders* sections (p. 246) of *SR4*.

One-shot auto-injectors are only detected if the test to scan the bearer's cyberware generates one additional hit on the *Cyberware Scanner Table* (see p. 254, *SR4*). The threshold to detect an alphaware one-shot auto-injector would be 3 instead of 2.

Balance Tail: A balance tail is a weighted cybernetic tail grafted to the base of the user's spine and connected to an expert system balance processor, adjusting itself to keep the user's center of gravity continuously balanced. The tail is not under conscious control and tends to twitch and sway randomly as the user moves. Its length can vary from about one meter for dwarfs to nearly two meters for full grown trolls. People equipped with a balance tail must have their clothes customized to accommodate the extra limb. A balance tail is available in a wide range of shapes, from the polished chrome-look of a skeletal dinosaur's tail to a furry cat's tail covered with latex and artificial fur.

The balance tail adds a +2 dice pool modifier on all tests involving balance, such as climbing, walking a ledge, jumping, and falling. It also increases the character's Body attribute by 1 when determining whether he is knocked down by an attack (see *Knockdown*, p. 151, *SR4*).

Biomonitor: This is the implanted version of the standard biomonitor system (see p. 329, *SR4*).

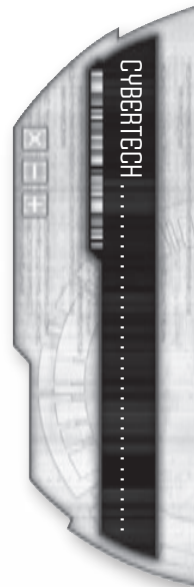
Blood Circuit Control System: This system of micro sensors, vents, and iris diaphragms surveys the pressure in the user's blood vessels and reduces or completely shuts down the blood supply to injured or traumatized body parts, preventing massive blood loss.

Any time the user suffers Physical damage, the damage is instantly reduced by 1 box to a minimum damage of 1 per attack. The blood circuit control system also increases the user's Body attribute by +2 for all aspects of staying alive when damage overflows the Physical Condition Monitor (see both *Exceeding the Condition Monitor*, p. 153, *SR4*, and *Stabilization*, p. 244, *SR4*). The blood circuit control system cannot be combined with platelet factories.

Bone Lacing: Similar to the bone lacing described on p. 333 of *SR4*, ceramic and kevlar bone lacing reinforce skeletal integrity. While ceramic bone lacing augments the bones with a sturdy, impact resistant poly-ceramic coating, kevlar bone lacing weaves a protective ballistic mesh around the individual's bones and joints.

Ceramic bone lacing confers a +2 Body bonus for damage resistance tests and a +2 bonus to Impact armor. Kevlar bone lacing confers a +1 Body bonus for damage resistance tests and a +1 bonus to Ballistic armor. The bonuses of both types of bone lacing are cumulative with worn armor and cannot be detected by metal detectors. Characters with ceramic bone lacing inflict Physical damage with their unarmed blows, though kevlar bone lacing offers no such advantage.

Cyberfins: Cyberfins consist of retractable semi-rigid fins and webbing implanted in the hands and feet. When extended, they allow the user to swim as if using ordinary swimming fins. Characters using cyberfins swim at their normal Swimming Rate (see p. 118, *SR4*) x 1.5 and receive a +2 dice pool modifier for all tests involving the Swimming skill. Cyberfins are not compatible with standard swim fins or any type of gloves.



Cyber Safety: This implant is designed for use with firearms modified with an embedded security chip, and is nothing more than a minor security chip itself. The firearm's safety is only deactivated when the weapon is held in the hand containing the implant, bringing the security chips of both into contact. Each security chip is programmed for a particular implant (or implants), and only functions with that implant (or implants). If the character also possesses a cyberware smartlink system, the safety links to it and the direct contact overrides any wireless smartlink input, essentially making the smartlink immune from hacking.

Dermal Sheath: While dermal plating bonds hard plastic and metal fiber plates to the user's skin, dermal sheathing weaves a smooth, semi-synthetic coating into the user's epidermis, resulting in sleeker and less bulky protection.

A dermal sheath is available in three levels of protection. Rating 1 covers the user's upper torso and confers a +1 Ballistic and +2 Impact armor bonus. Rating 2 covers the torso, groin, and thighs and confers +2 Ballistic and +3 Impact armor bonuses. Rating 3 covers the user's entire skin and confers +3 Ballistic and +4 Impact armor bonuses.

Dermal Sheaths can be stylized for surface texture and color just like dermal plating (see *Cosmetic Cyberware*, p. 33, for options). Additionally some dermal sheaths use a technology derived from ruthenium polymers, allowing the sheath to change across a wide array of colors through a low-level electric charge. The color display is usually controlled via the user's PAN or per direct neural command to display colors, text, or images downloaded from the Matrix or stored in the user's commlink or headware memory. A Rating 3 dermal sheath may also be further modified by adding an expert sensor suite that scans and replicates the surroundings to function similar to a chameleon suit (see p. 316, *SR4*) if the user does not wear clothes or other armor. Dermal sheaths are incompatible with orthoskin, dermal plating, and smart skin augmentations.

Flex Hands: This modification replaces most of the bones in the hands with piezoelectric ceramic that can be slightly deformed under pressure and returns to its normal shape upon the character's mental command. Flex hand modification also treats the nerves in the hands to diminish pain feedback when performing such operations. This allows the user to squeeze his hand into/through tight openings, such as handcuffs and other restraining devices.

A character with flex hands receives a +2 dice pool modifier for any tests using the Escape Artist skill, as well as any other tests that involve hand contortions. Flex hands are not compatible with bone lacing or cyberhands, and can be turned on and off.

Foot Anchor: Foot anchors are retractable, spring-loaded, heavy-duty barbed spurs that may be shot down through the heel of their owner's foot, anchoring him to the ground. They are primarily intended to be used in cyberfeet. When installed in ordinary feet, they require extensive ankle and shin bracing so that the bones don't snap off near the blade when pressure is applied. Foot anchors cannot penetrate materials with a Barrier rating higher than 10 (most pavements have a Barrier rating of 8). Characters receive 1 point of recoil compensation (not compatible with bi- or tripods) and a bonus of +2 to their Body rating for Knockdown Tests (see p. 152, *SR4*) per foot anchored. Only one anchor can be installed per foot. If used as a weapon, foot anchors deal the same damage as cyberspurs (STR ÷ 2 + 3P).

Gastric Neurostimulator: This implant monitors gastro-neural reflexes and uses electrical impulses to stimulate the vagus nerve and disrupt sensations of nausea, making the character immune to such queasiness. This 'ware is popular with orbital workers, sailors, and others who must deal with motion sickness on a regular basis. Characters with this implant are immune to the effects of nausea (p. 245, *SR4*) and disorientation caused by nausea.

Grip Feet: Sometimes known as monkey paws, these implants are quite popular with orbital jacks and augmented climbers of all types. Commonly built into cyberfeet, they are also available as a modification to natural feet, with some more extensive restructuring. Grip feet are adapted with extendable and articulated toes and the soles are treated with rubberized material that increases traction. Toe length is extended to allow them to curl around a 5 centimeter bar. This implant grants the recipient a +2 dice pool bonus on non-tumbling Gymnastics and Climbing Tests when barefoot, as well as any movement tests in microgravity.

Magnetic System: This system consists of a series of electromagnets mounted along the length of a limb. When the system is activated, the limb can hold on to or cling to ferrous-metal objects more strongly. Note that in the 2070s, many metals are nonferrous, semi-metallic polymer compounds, including those used in weapons and cyberware. Ferrous metals are still used in heavy vehicles (big cars, trucks, maglev trains), large constructions, building support structures (railway bridges, railings, beams, cables), and so on. Ferrous metal can also be added to devices such as gun grips to take advantage of a magnetic system, making dropping or disarming the gun almost impossible. The magnetic field produced by this system, when active, provides a -1 dice pool modifier to all wireless Matrix Tests made by the character.

Each magnetic system adds a +1 dice pool modifier to any test the user makes for purposes of holding or attaching himself to large metallic items or surfaces or a +2 dice pool modifier for maintaining the grip to handheld objects. Only one magnetic system can be installed in each limb.

A magnetic system can also be overloaded by overriding the internal security measures (requiring a Simple Action) to deliver an electric charge upon contact, doing the same damage as a shock hand (see p. 337, *SR4*). After a limb has successfully been used in such manner, it requires 1 minute for the electromagnets to become operational again.

Move-by-Wire System: Move-by-wire-systems are the cutting-edge in motion control and reaction augmentation. They operate by putting the user's body in a constant state of seizure, so that it wishes to move in all directions simultaneously. An implanted expert system monitors the seizure and counteracts its effects until the user wishes to act. At that point, it channels the effects of the seizure along the desired path of motion, enabling the user to act with amazing speed and move with unnatural smoothness. The move-by-wire-system is based on similar systems used in aircraft, drone, and vehicle control and has proven to be highly effective—if sometimes debilitating to biological subjects. Move-by-wire users frequently suffer from slight, but uncontrollable, muscle tremors in certain muscle groups when they are at rest, mostly due to errors in the system's seizure compensation.



The move-by-wire system confers a bonus of +2 to the character's Reaction attribute, +1 to the character's Dodge skill rating, and +1 Initiative Pass per point of rating. It also functions as skillwires (p. 335, *SR4*) at the following level:

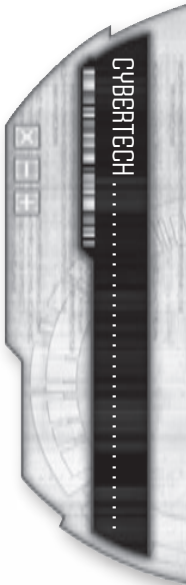
Move-by-wire cannot be combined with any other form of Initiative enhancement except for reaction enhancers.

Move-by-Wire Rating	Skillwire Rating
1	2
2	4
3	5

Bodyware	Essence	Capacity	Availability	Cost
Auto-Injector				
Reusable (1 dose)	0.1	[0]	4	500¥ + contents
One-shot (1 dose)	0.05	[0]	8	700¥ + contents
Extra Dose Capacity (Max 6)	—	[0]	—	+100¥ per dose
Balance Tail	0.5	—	9	5,500¥
Biomonitor	0.3	[1]	4	1,000¥
Blood Circuit Control System	1	—	15	30,000¥
Bone Lacing				
Ceramic	1.2	—	12F	22,500¥
Kevlar	1	—	10F	10,000¥
Cyberfins	0.3	[3]	9	3,500¥
Cyber Safety	—	[1]	7	350¥
Dermal Sheath				
Rating 1	0.6	—	8	10,000¥
Rating 2	1.0	—	12	20,000¥
Rating 3	1.6	—	16	40,000¥
Ruthenium Polymer Coating	—	—	+2	+2,500¥
Chameleon Modification	+ 0.2	—	+4R	+4,000¥
Flex Hands	0.3	—	10	3,500¥
Foot Anchor	0.4	[3]	10	4,000¥
Gastric Neurostimulator	0.2	—	6	2,500¥
Grip Feet	0.3	[2]	10	6,000¥
Magnetic System	0.25	[2]	8	1,200¥
Move-by-Wire System				
Rating 1	2	—	12R	50,000¥
Rating 2	3	—	18R	85,000¥
Rating 3	5	—	25F	175,000¥
OXSYS Cybergill	0.25	—	6	4,500¥
Retractable Climbing Claws	0.2	[2]	8	2,200¥
Smart Articulation	0.8	—	6	15,000¥
Skillwire Expert System	0.1	—	8	3,000¥

Unarmed Combat Attack	Reach	Damage	AP
Ceramic Bone Lacing	—	(STR ÷ 2 + 2)P	—
Retractable Climbing Claws	—	(STR ÷ 2)P	—

Firearm Accessory	Mount	Availability	Cost
Cyber Safety	—	6	200¥



OXSYS Cybergill: The OXSYS cybergill draws in water and filters out oxygen through forced osmosis, allowing users to breathe underwater. Carbon dioxide and water gases are absorbed into the water through reverse osmosis and expelled. Unlike the external version, the oxygen is delivered via solution directly into the bloodstream, averting the danger of oxygen toxicity. The gills are implanted on both sides of the neck adjacent to the thyroid gland. A cutoff valve must also be installed in the lower trachea to prevent lung action during operation, and pulmonary bypasses must be inserted in the heart to reroute blood flowing toward the lungs up into the gills.

Divers using cybergills are immune to oxygen toxicity, but they remain vulnerable to nitrogen narcosis and decompression sickness from the residual amount of nitrogen. As a matter of common practice, divers who choose cybergill implantation also commonly install an internal air tank (see p. 334, *SR4*) containing pure helium that they use to flush residual nitrogen from their lungs. Cybergills allow a user to stay underwater indefinitely.

Retractable Climbing Claws: Similar to retractable hand razors, these claws are short and hooked, and their bone attachment is reinforced. They extend from the finger tips and assist in climbing, giving the user a +2 dice pool bonus for Climbing Tests. If used as weapons, climbing claws deal a DV of (STR ÷ 2)P.

Skillwire Expert System: This modification package boosts the performance of a skillwire system, improving the integration of skillsoft simsense data with the user's own neurotransmitters and neuromuscular junctions. This implant allows a character with a skillwire system (p. 335, *SR4*) to use Edge to re-roll a failed test when using skillsofts; Edge may not be used in any other way to boost tests with skillsofts (see p. 320, *SR4*).

Smart Articulation: This system modifies the body's skeletal joints, replacing connective tissue with high-tensile smart materials, neural contact maps, and shock-gel sacs. The resulting combination allows the recipient to set his or her own skeletal rigidity. On a loose setting, contortionists' feats are easy to replicate. The user receives a +2 dice pool modifier on Escape Artist Tests and to break out of locks in grappling combat (see p. 152, *SR4*). The character can also wriggle through very tight openings (a few inches wider than the character's skull) and contort to fit into half as much space as usual.

On a rigid setting, even a determined grappler cannot dislodge joints and the character's limbs become inflexible. Smart articulation adds +2 to the user's Body when comparing with the attackers Strength + net hits to resolve a subdual in melee combat (p. 152, *SR4*). He or she also gains +1 die to Gymnastics and Climbing dice pools since the system takes the strain off joints when absorbing the character's weight for short amounts of time.

Unfortunately, in either loose or rigid settings, the user will find it difficult to walk or run. Until he returns his skeletal rigidity to its normal setting, he will only be able to move half as fast as usual, because he must adjust his gait to excessively loose or tight joints. Smart articulation is incompatible with enhanced articulation and elastic joints; it is also still currently unavailable for cyberlimbs.

CYBER-IMPLANT WEAPONS

For general rules concerning cyberguns and cyber melee weapons see p. 336, *SR4*. None of the following weapons are designed to allow aim enhancers or other accessories.

Dartgun: This cyberweapon fires small darts, usually containing a chemical compound, at the target. If the target takes damage from a dart it is affected by the chemical compound or toxin delivered (see *Using Toxic Substances*, p. 245, *SR4*). The dartgun uses light pistol ranges.

Eye Dart: An eye dart is a small, specialized, single-shot dart-launcher that could be used as last resort or surprise weapon. Eye dart projectiles usually deliver a toxin or other compound (which must be acquired separately) to overpower the target, since killing or severely harming someone with the tiny dart is highly improbable.

This enhancement only affects one eyeball per purchase and can only be purchased once per eye. Eye darts require the Exotic Ranged Weapon: Eye Dart skill to be used. The weapon uses taser ranges. Reloading takes 1 minute.

Fingertip Dartgun: The fingertip dartgun is a modified version of the common cyber-implant dartgun (see above). While the normal cyber-dartgun features one barrel fed via an internal magazine and fires through the palm, this dartgun installs one small barrel with a single dart in each finger. A character with this kind of dartgun may either fire one dart at a time or all five at once



Cyberweapon	Essence	Capacity	Availability	Cost
Dartgun	0.35	[3]	12R	1,400¥
Eye/Oral Dart	0.25	[3]	14R	1,500¥
Fingertip Dartgun	0.45	[4]	16R	2,750¥
Oral Gun	0.25	[3]	14R	1,600¥
Oral Slasher	0.25	[3]	12R	1,500¥
Projectile Spur	0.3	[4]	12F	2,200¥
Squirtgun	0.3	[4]	10R	1,250¥
Taser	0.3	[3]	8R	1,000¥

Cyberweapon Mounts

Articulated Weapon-Arm	—	[8]	24F	5,000¥
External Mount	—	[7]	16F	2,500¥



in a spray, using the rules for a wide long burst (see *Long Bursts*, p. 143, *SR4*), applying a -4 dice pool modifier (or less, if there are fewer than 5 darts remaining) to the defender's dice pool.

Due to the extensive modifications necessary to each of the character's fingers, the fingertip dartgun is only available for cyberlimbs (requiring a least a cyberhand).

Oral Dart: Similar to the eye dart, this version is implanted in the roof of the mouth and is equally useful as a surprise weapon. The oral dart uses taser ranges and is only good for a single shot, normally a narcoject/toxin-loaded round. The weapon includes a safety that keeps it from discharging unless the user's mouth is open. A -1 dice pool penalty applies to characters equipped with oral darts when making Perception Tests using their sense of smell, as the implanted weapon interferes with the normal functions of the sinuses. Oral darts require the Exotic Ranged Weapon: Oral Dart skill to be used. Reloading takes 1 minute.

Oral Gun: Like the oral dart, this four-shot micropistol is implanted at the back of the mouth. It includes the same safety features and incurs the same penalties to Perception Tests (doubled for two hours after a discharge) as the oral dart. Oral guns require the Exotic Ranged Weapon: Oral Gun skill to be used. Treat the oral gun as a hold-out pistol. The gun is reloaded via a small port beside the gun; reloading takes 1 minute. Triple the cost of ammo for this weapon.

Oral Slasher: The oral slasher is a spring-loaded extendable baton with a blade on the tip, stored underneath the tongue. When triggered, it shoots directly outward, impaling any close target, then retracts into the mouth. The oral slasher has a range of 1 meter, so this is treated as a melee attack. Using this weapon requires the Exotic Melee Weapon: Oral Slasher skill. If the attacker rolls a critical glitch, he has struck himself and must resist the slasher's standard damage.

Projectile Spur: Miniaturization allows this modification to be added to cyberspurs (p. 337, *SR4*) built into wrists, elbows, or knees. The standard snap action mechanism of normal spurs can be

supplemented with a compressed-air catapult, allowing the user to spring the spur as normal *or* to fire the spur as a projectile over short distances at will. In the latter case, the character uses his Throwing Weapons skill to resolve the attack, though the catapult's Strength of 14 is used for range and damage calculation. After retrieval, reloading and resetting the spur takes 5 Combat Turns.

Squirtgun: An implanted squirtgun similar to the Ares S-III model (p. 309, *SR4*).

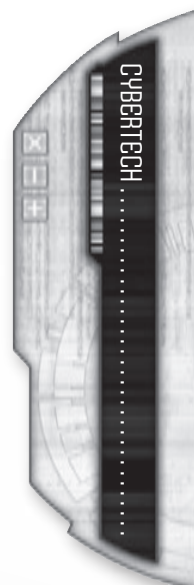
Taser: An implanted version of the standard taser.

Weapon Mounts

These additional weapon fixing points may be used to increase a character's firepower. Each weapon mount is considered to be a smart firing platform (see p. 311, *SR4*), enabling a character to remotely fire the mounted weapon. A weapon mount requires a smartlinked weapon to be operated, as well as a smartlinked user when fired remotely. Weapon mounts do not offer additional recoil compensation beyond that (possibly) installed in the weapon itself.

Articulated Weapon Arm: This is a separate articulated tracking mount, anchored in the middle of the character's back and extending out over the user's shoulder or out to the side for a clear field of fire. It has a full range of motion (except for dead spots behind the user's body, depending upon the exact actual location of the highly mobile weapon arm) and may be equipped with a light machine gun or smaller weapon. Articulated weapon arms require a cyber torso to be installed and a Simple Action to be readied.

External Mount: These are bulky attachments to either the character's arms or shoulders, holding the mounted weapon in a cased, motorized, pivoting system that enables the weapon to fire in the direction the character looks or points his appropriate arm (and within a 15-degree pivoting range). External Mounts require a full arm or torso cyberlimb replacement to be installed and may be equipped with submachine guns and smaller-sized weapons.



Ranged Cyberweapon	Damage	AP	Mode	RC	Ammo
Dartgun	3P	—	SA	—	5 (m)
Eye/Oral Dart	2P	—	SS	—	1
Fingertip Dartgun	3P	—	SA/FA*	—	5 (m)
Oral Gun	4P	—	SS	—	4 (m)
Projectile Spur	7P	-2	SS	—	1
Squirtgun	Chemical	—	SA	—	10 (m)/15 (c)
Taser	6S(e)	-half	SA	—	4 (m)

Melee Cyberweapon	Reach	Damage	AP
Oral Slasher	—	4P	-2

Ammunition, Per 10 Shots	Armor Used	Availability	Cost
Darts	I	8R	15¥

* One Long Burst only (see description).

Urgent Message...

OPTIONAL RULE: REDLINING A CYBERLIMB

If the gamemaster allows it, cyberlimbs can be pushed beyond their design parameters. A cyberlimb user can take a Simple Action to temporarily override cybernetic safeguards and “redline” the cyberlimb’s attributes, increasing one attribute to any value up to double the cyberlimb’s normal rating in that attribute. The character may even exceed his augmented attribute maximum in this way. At the end of each Combat Turn a cyberlimb is redlined in this manner, however, the limb and the character suffer damage from muscle sprains, ligament tearing, and general biostress. The DV of such damage equals twice the attribute modifier taken by redlining in Stun damage, and is resisted with Body. For example, a character who redlines his cyberarm from Strength 4 to Strength 8 to pull open a door will suffer 8S damage each Combat Turn he redlines his arm.

take up any Capacity. Further increases above the natural attribute maximum and up to the augmented maximum must be handled as cyberlimb enhancements, with the standard Capacity and nuyen costs (see *Cyberlimb Enhancements*, p. 335, SR4).

All other stats of customized cyberlimbs are the same as for standard cyberlimbs (see *Cyberlimbs table*, p. 336, SR4).

Carlos is an ork street samurai with Body 8, Strength 6, and Agility 4. Carlos wants his new obvious cyberarm customized with respect to his natural physique and to have the same physical basic attributes he has. Carlos raises the basic attributes of his cyberarm to these stats, an increment of 9 attribute points total (a 5 point increase from Body 3 to Body 8, 3 points from Strength 3 to Strength 6, and finally 1 point to raise his arm’s Agility from 3 to 4). The cyberarm’s availability is increased by 9 points and becomes 13, while the price is raised by \$13,500 and is now 28,500¥.

A few months later, when Carlos has some extra cash in his account thanks to a very profitable job, he decides that he wishes to enhance his cyberarm’s attributes even further. Since Carlos has no cybertorso, he can only have cyberlimb enhancements with a rating of 3. He decides to purchase a Rating 3 Strength enhancement and a Rating 1 Body enhancement to add a decent punch to his new melee attacks and a little bit of extra durability to his new cyber toy. Both enhancements require a total Capacity of 4 points (3 for the Strength enhancement and 1 for the Body enhancement), leaving 11 Capacity points of the arm’s 15 starting capacity for future enhancements or accessories. The enhancements cost an additional 950¥. Carlos’s cyberarm now has Body 9, Strength 9, and Agility 4.

CYBERLIMBS

Cyberlimbs are often seen as the poor person’s choice, when growth and transplantation of clone replacements cannot be afforded. Since cyberlimbs are also available in versions that are vastly superior or more versatile than the ones that can be “bought off the rack,” however, and some specialized cyberware is only available for use in cyberlimbs, this kind of cyberware is just as cutting edge as ever.

Use the standard cyberlimb rules as described on p. 335, SR4, unless otherwise noted.

Customized Cyberlimbs

Standard cyberlimbs come with Body, Strength, and Agility attributes of 3 (see *Cyberlimbs*, p. 335, SR4). While these basic attributes are adequate for the average human or elf, they are underpowered for the natural physiques of many dwarfs, orks, and trolls—as well as exceptionally large and physical fit humans and elves. Customization allow cyberlimb attribute ratings to be increased by tailoring the limb to user’s overall size and musculature. Since these customized cyberlimbs need to be designed to fit their user’s body, they are more expensive than the basic models and are not covered by medical insurances.

Customized cyberlimbs come with Body, Strength, and Agility attributes that may exceed the standard cyberlimb attribute rating of 3. Each customized cyberlimb may have a starting Body, Strength, and Agility attribute of up to the character’s natural attribute maximum (see pp. 62 and 73, SR4). Each point of increment to an attribute above 3 raises the limb’s Availability rating by 1 point and adds 1,500¥ to the final cost, but does not

Bulk Modification

Some people prefer to have extra room in their cyberlimbs for enhancements and gadgets, and don’t mind the limb taking up a little extra space. The bulk modification is only available for obvious cyberlimbs, but it raises the limb’s Capacity in exchange for increased Cost. Only lower arms/legs, full arms/legs, and torsos may have their Capacity increased by more than 2. Bulk modifications usually mean the character’s clothing must be adjusted, and at the gamemaster’s discretion, a bulkier cyberlimb may impede certain activities, incurring a –1 dice pool modifier (this is particularly true in the case of uneven legs).

Optimized Cyberlimbs

The majority of cyberlimbs are designed for everyday use and mimic a metahuman’s standard abilities and range of activities. As cyberlimbs have grown increasingly more accepted and become more prominent in certain fields—particularly sports and entertainment—the demand has grown for cyberlimbs that are optimized for certain activities: running, throwing, playing guitar, etc. As a result, a new generation of cyberlimbs has hit the market, specially-crafted for certain needs. For example, a cyberarm

Customized Cyberlimbs	Essence	Capacity	Availability	Cost
Each BOD, STR, or AGI point above 3	as cyberlimb	as cyberlimb	+1	+1,500¥



optimized for boxing features improved hydraulics for faster and harder punches and enhanced articulations and “muscle memory” for spectacular uppercuts and hooks. While optimized cyberlimbs allow a character to better perform certain actions, they are more expensive and feature less capacity for enhancements and accessories as their design is more dedicated to specific tasks.

Cyberlimb optimization modifications are only available to full arm and leg cyberlimbs, and must be chosen when the cyberlimb is purchased. Below are some common examples of available optimizations; gamemasters can also create their own, using these as guidelines. Optimized cyberlimbs are not available as modular cyberlimbs, but they may be customized. Only one optimization is available per cyberlimb.

Body+Tech Verticalist: Popular with rock-climbers, this optimization provides a +1 dice pool bonus per modified limb (maximum +2) to Climbing Tests.

Evo Kali: A favorite with knife fighters and wanna-be samurai, this optimization provides a +1 dice pool bonus to Blades Tests when the modified arm is wielding a bladed weapon.

Ferrari Sprinter: This optimization must be applied to both legs, but provides a +2 dice pool bonus on Running Tests.

Louisville Slugger: Designed for baseball players, this feature adds a +1 dice pool bonus to Clubs Tests when the modified arm is wielding a club.

Nightengale Feet of Fury: This optimization adds a +1 dice pool bonus per modified leg to Unarmed Combat Tests (when kicking).

Ultimate Champion: This adjustment provides a +1 dice pool bonus per modified cyberarm to Unarmed Combat Tests.

Yankee Pitcher: This optimization adds a +1 dice pool bonus to Throwing Tests made with the modified cyberarm.

CYBERLIMB ACCESSORIES

The following cyberlimb accessories may be added to any normal cyberlimb, thereby taking up Capacity.

Cyberskates: These retractable, in-line skates may be installed within a character’s cyberfeet, enabling him to increase his Walking and Running Rate (see *Movement*, p. 138, *SR4*) by one half (round down). Cyberskates are compatible with raptor cyberlegs and must be installed in both feet.

Scanner System: Very popular with bodyguards and security personnel, this accessory installs a discreet internal magnetic anomaly detector (MAD) and processor (see *Scanners*, pp. 254–255, *SR4*) into a cyberlimb allowing the recipient to scan nearby (1 meter) individuals for concealed weapons and cyberware.

Snake Fingers: A character with this accessory may extend his fingers up to double their usual length and bend and curl them in any direction, just like miniature snakes (hence the name). Due to the length and increased flexibility of his fingers, the character may reach through tight and narrow gaps and spaces.

The gamemaster may grant the character a dice pool modifier of +2 to appropriate feats of manual dexterity. Snake fingers may only be installed on a cyberhand.

Telescoping Cyberlimb: Cyberlimbs with this accessory can be extended like an antenna, allowing the user to be elevated or reach higher, adding up to 1 meter to the length of each limb. Telescoping cyberlimbs require a Simple Action to pop out or retract. Extended limbs are not flexible and can be clumsy to move with or use. Because of their awkwardness, the gamemaster may apply a negative dice pool modifier of up to –2 to any test where limited flexibility is a factor (such as running, dodging, and most athletic activities). An extended cyberarm provides a +1 Reach bonus in melee combat (possibly counteracted by the inflexibility modifier at the gamemaster’s discretion).

Telescoping cyberlimbs do not affect a character’s fingers, since only the upper and lower arm may be extended. This accessory may not be implanted in cyberhands or cyberfeet; full or partial cyberlimbs are required.

MODULAR CYBERLIMBS

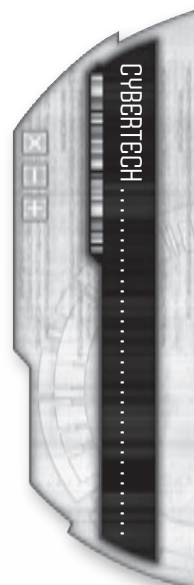
Modular cyberlimbs allow a character to easily swap out their cyberhand, cyberfoot, or lower cyberlimb with a replacement hand/foot/limb. Modular cyberlimbs feature a universal cyberware connector plug (UCCP) just below the wrist, elbow, ankle, or knee joint, allowing them to be easily detached and re-attached. In addition to back-up cyberlimbs, the character could also attach specialized equipment or certain tools, known as *modular cyberlimb plug-ins*.

Modular cyberlimbs and plug-ins can be controlled via their integral neural connection or the owner’s PAN. Attaching or removing a part of a modular cyberlimb requires a free hand and a Complex Action. Modular cyberlimbs may be obvious or synthetic, and are equipped with any enhancements, accessories, weapons, or other kinds of equipment that a normal cyberlimb of that type accepts. At the gamemaster’s discretion, however, modular cyberlimbs may be incompatible with certain normal cyberlimb accessories (such as spurs, cyberskates, etc) due to size or mechanical incompatibilities.

Common Modular Cyberlimb Plug-Ins

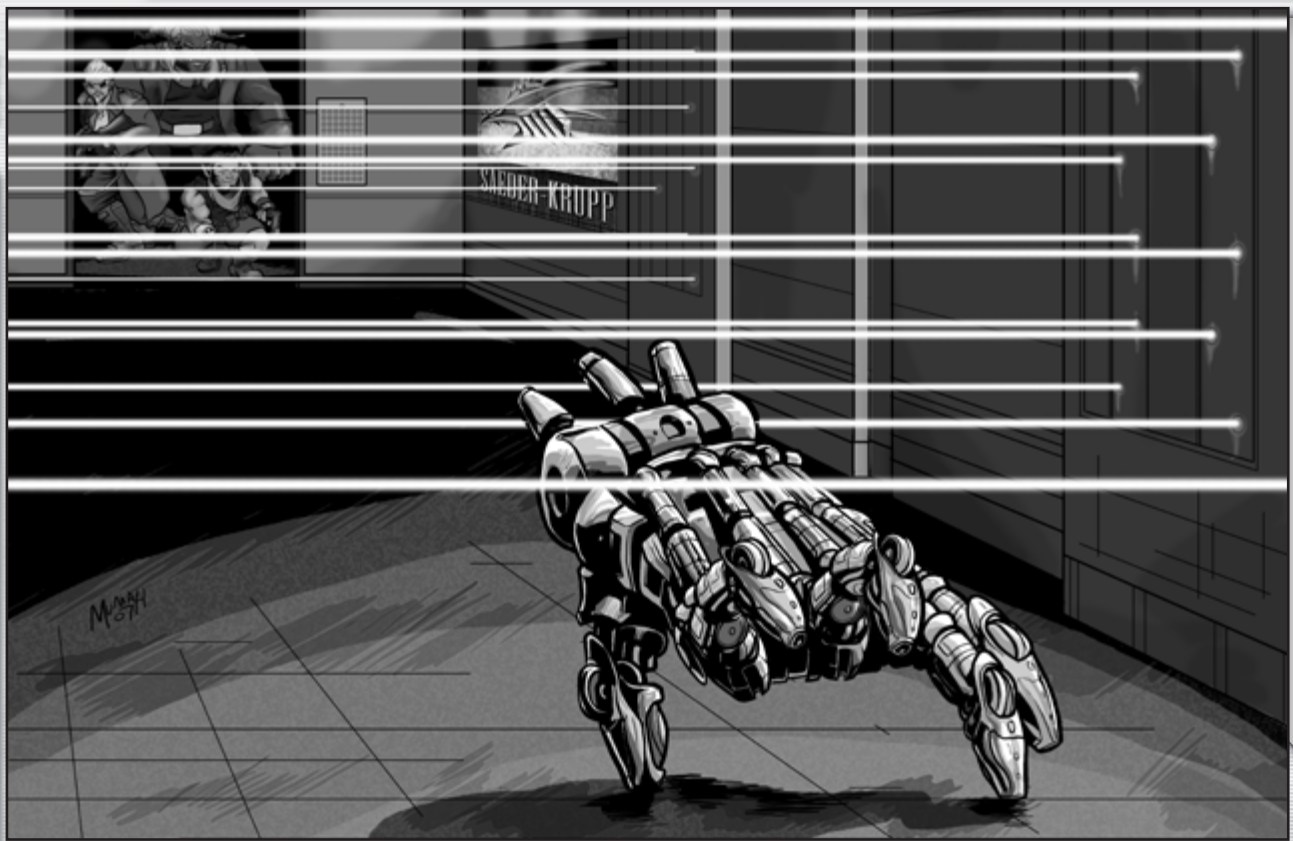
Most modular cyberlimb plug-ins consist of tools or other working equipment. The plug-ins below feature some common examples, but since numerous other common tools and devices could be easily converted to accept a UCCP—not to mention unusual tools and industrial equipment—gamemasters are free to develop their own plug-ins, using the suggestions below as a guideline. Typical plug-ins are very functional and do not possess the same degree of fine manipulation ability, sensory feedback systems or accessory capacity a normal cyberlimb would boast.

The *Replaced Limb* category indicates whether a plug-in takes up the space of just the cyberhand (or cyberfoot) or the full lower



Bulk Modification	Essence	Capacity	Availability	Cost
Each Increased Capacity Point (Max. 4)	—	+1	+1	+1,000¥

Implant	Essence	Capacity	Availability	Cost
Optimized Cyberlimb	per cyberlimb	–2	+4	+5,000¥



INCOMING FEED.....



limb (hand/foot included). A cyberhand replacement plug-in may be used on a lower limb plug, it just shortens the reach. A modular limb can only have one plug-in attached at a time.

Built-in Utility Kit: These plug-ins consist of a standard tool kit (see *Tools*, p. 323, *SR4*) including useful supporting devices like rotating tool holders (picking, for example, the right screwdriver point and rotating it to the front), a small power drill, and the like.

Built-in Medkit: This plug-in replaces the forearm with a fully equipped medkit (p. 329, *SR4*), a set of retractable multifunctional surgical implements, syringes, and micro-manipulators. The plug-in medkit uses standard medkit supplies (p.330, *SR4*).

Drone Hand: This plug-in allows the cyberhand to detach and function as a small crawler drone (use the stats for the *Aztechnology Crawler*, p.342, *SR4*). The fingers of the drone hand telescope slightly to provide better balance and locomotion, and

the drone hand may be controlled by a rigger normally via wireless link. The drone hand features sensor and antenna arrays built into the wrist that are activated when the drone is detached and may be upgraded normally. The multifunctional and compact mechanics, however, do not allow further modifications.

Grapple Hand: This mod features a gun built into the lower arm that shoots the cyberhand like a grappling hook out to a maximum range of 30 meters. The hand is attached via myomeric rope (p. 329, *SR4*) and can be remotely manipulated to grasp onto surfaces. An internal winch allows the character to pull himself up or retrieve his hand. Use Exotic Ranged Weapon: Grapple Gun to wield this as a weapon; it is resisted with Impact armor.

Hydraulic Press: This high-powered press features a large claw and a hydraulic pump built into the lower arm replacement. It can be used to either press things together or bend them apart (for example

Implant	Essence Cost Multiplier	Availability Modifier	Cost Multiplier
Modular Cyberlimb	1	+1	1.1

Cyberlimb Accessories	Essence	Capacity	Availability	Cost
Cyberskates (pair)	—	[3]	5	650¥
Scanner System (Rating 1–4)	—	[2]	6R	Rating x 500¥
Snake Fingers (per hand)	—	[1]	6	1,000¥
Telescoping Cyberlimb (per limb)	—	[2]	6	2,500¥

CYBERTECH



two iron bars or grinders fixed in close proximity) with a Complex Action. The power of a hydraulic press is equal to a Strength attribute of 20. Unarmed Combat skill is used to wield this plug-in as a weapon (like a big club hand); to pinch an opponent within the press, the target must be immobile or subdued first (see *Subduing*, p. 152, SR4).

Jackhammer: Most often employed by cybered construction workers, this attachment represents a high-powered pneumatic piston, stabilizer, and shock absorber arrangement which can be fitted with either a 20-centimeter blunt ram or a 10-centimeter piercing/edged bit. The former can be used as a ram or jackhammer to break down or shatter obstacles. The latter is better suited to punching smaller holes in walls, doors, or floors. To use it as a weapon, the character uses the Unarmed Combat skill (in the arm—use the Exotic Melee Weapons skill if implanted in the leg).

Nail Pistol: The nail pistol is loaded with special clips of nails and uses pressurized air to shoot them into walls, boards, trees, or the occasional metahuman body. The Pistols skill is used to fire it like a weapon; the nail pistol uses taser ranges.

Raptor Cyberlegs: Popular in the club scene, these obviously non-metahumanoid cyberlegs are shaped like the hind legs of a quadruped animal such as a dog or the running legs of a predatory

dinosaur like the velociraptor (hence the name of these legs). The feet can be hoof-shaped, paw-shaped, or splayed like the feet of a bird. The shape of these legs allows the user to run more quickly and increases the power of kicking attacks.

To gain any advantage from this modular plug-in, both of the character's lower legs must be replaced. A character with these legs increases his Walking and Running Rate (see *Movement*, p. 138, SR4) by one half (round down). Raptor cyberlegs also provide a +2 Strength bonus to any kicking attacks and a +2 dice pool bonus to Gymnastic Tests (including Gymnastic Dodge Tests).

Raptor cyberlegs may be equipped with cyberlimb accessories. They have a Capacity of 10. Characters may also install cyber-implant weapons such as toe razors or retractable blades in raptor cyberlegs, using their Exotic Melee Weapon skill to attack (and receiving the +2 Strength bonus mentioned above).

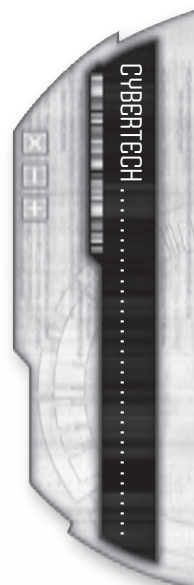
Skimmer Discs: A modular plug-in for cyberfeet, these ground effect platforms are based on microskimmer drone technology. When in use, the discs create a directed ground-effect cushion under the character's feet, allowing him to hover a few centimeters above the ground. Ducted fans and some practice at controlling inclination provide thrust and direction. Skimmer

Modular Plug-In	Replaced Limb	Availability	Cost
Built-in Utility Kit	Lower Arm	6	1,500¥
Built-in Medkit	Hand	7	1,000 + (Rating x 100¥)
Drone Hand	Hand	8	3,500¥
Grapple Hand	Lower Arm	12R	3,000¥
Hydraulic Press	Lower Arm	8	5,000¥
Jackhammer	Lower Arm/Leg	8	5,000¥
Nail Pistol	Hand	8	900¥
Raptor Cyberlegs (pair)	Lower Legs	12	25,000¥ (both)
Skimmer Discs (pair)	Feet	8	5,000¥ (both)
Vacuum Pump	Hand	6	4,000¥
Waterjets (pair)	Feet	8	3,000¥
Welding Laser	Hand	10R	3,000¥

Gear	Availability	Cost
Modular Plug-in Adaptation	+2	+500¥

Melee Attack Plug-In	Reach	Damage	AP
Hydraulic Press (strike)	—	(STR ÷ 2+1)P	—
Hydraulic Press (pinch)	—	10P	-4
Jackhammer (ram)	—	6P	—
Jackhammer (drill)	—	6P	-2

Ranged Attack Plug-In	Damage	AP	Mode	RC	Ammo
Grapple Hand	5S	—	SS	1 (ml)	
Nail Pistol	4P	—	SA	—	30 (c)
Welding Laser	5P	-half	SS	—	10 (battery) or external



discs allow the character to move at twice his normal Walking and Running Rates (see *Movement*, p. 138, *SR4*) while hovering 10 to 30 centimeters above the ground. Excessive weight (at the gamemaster's discretion) or particularly rough terrain may make it difficult to maneuver skimmer discs.

Vacuum Pump: The vacuum pump plug-in builds up a strong vacuum to inhale fluids, dirt, and debris. An external hose part allows any vacuumed material to be shunted away to a disposal container, as the plug-in itself has limited storage capacity. To free an object from the intake point of a powered vacuum pump, an Opposed Strength Test against the pump's Strength of 10 is required.

Waterjets: This plug-in replaces the feet with a pair of waterjets for faster travel underwater. Waterjets triple the character's Swimming rate (see *Movement*, p. 138, *SR4*).

Welding Laser: This high-powered laser is used for spot welding and cutting through metal and barriers. The laser's batteries only hold enough charge for 10 focused shots or 5 minutes of constant cutting operations. For this reason, the welding laser is usually cable-connected to the local power grid. To wield it as a weapon, use the Exotic Ranged Weapon: Laser skill; the welding laser uses taser ranges.

CYBERWARE SUITES

Whereas breakthroughs in cybernetic implantation have slowed in the past few years, and many believe chrome is passé, several major corporations have poured considerable research and development into making existing products less invasive and more competitive with parallel technologies. This has led to a shift in cyberware design—approaching implantation with an eye towards multi-implant integration and reduced system redundancies. In doing so, developers and manufacturers have given rise to a whole new market trend: cyberware suites. These suites consist of specially integrated cyberware packages that have been optimized to work seamlessly and minimize redundancy, reducing overall invasiveness when implanted as a single package.

Cyberware Suite Rules

While the cyberware suites introduced below represent only a sampling of the many available in the back-alleys, clinics, and treatment rooms of the Sixth World, the gamemaster should always keep in mind that cyberware suites—even those of high-grades—are *not* designed to a runner's needs, but are standardized packages the cyberware manufacturer develops with a potential consumer in mind, be they corporate employees or the customers off the street.

Gamemasters are encouraged to develop their own cyberware suites, as best fits their campaigns. Cyberware suites have Cost and Essence Cost Multipliers of 0.9 when adding up the integrated individual cyberware systems. These multipliers are cumulative with the modifiers offered by higher grade cyberware (see *Cyberware and Bioware Grades*, p. 303, *SR4*).

Example Suites

Lone Star SWAT Suite: This cyberware suite constitutes the standard cyberware load-out for members of Lone Star SWAT teams. Similar cyberware packages have been developed for members of other law enforcement corporations or military units (such as Knight Errant, the UCAS Army, or MET2000). The Lone Star SWAT suite consists of:

- TrumanTech *SunFire A* flare compensation, thermographic vision, and smartlink eye modifications
- Biogene *TacBone RP* plastic bone lacing
- Transys *Livewire* wired reflexes (Rating 1)

Shiawase Executive Suite Line: Shiawase's Executive Suite Line provides the wealthy corporate mid- to high-ranking executive with the cyberware features needed for achieving maximum efficiency at his job. The Executive Suite features:

- Shiawase-Vector *Sigma II* headware commlink (using the same stats as a Fairlight *Caliban* commlink, see p. 319, *SR4*) with integrated sim-module

Cyberware Suite	Essence	Availability	Cost
Lone Star SWAT (standard)	2.52	12F	16,875¥
Watchman Version (alphaware)	2.02	12F	33,750¥
Shiawase Executive Suite Line			
Silverline (alphaware)	0.76	11	47,700¥
Goldline (betaware)	0.66	14	95,400¥
SK-Cyberlogician			
Standard Civilian Version (alphaware)	1.98	16F	186,480¥
Deluxe Civilian Version (betaware)	1.73	19F	372,960¥
Standard Military Version (alphaware)	2.48	22F	305,730¥
Deluxe Military Version (betaware)	2.17	25F	611,460¥
Urban Kshatriya (standard)	2.43	15F	26,415¥
Alpha Version (alphaware)	1.94	15F	52,830¥
Beta Version (betaware)	1.7	18F	105,660¥
Zeiss SenseSation Line			
Basic Edition (standard)	1.35	12	24,750¥
Livecaster Edition (alphaware)	1.08	12	49,500¥
Executive Edition (betaware)	0.95	15	99,000¥





- ATC 3318 *Pearl* image link retinal modification
- Shiawase *Babylon* datajack
- Shiawase *XtrAlert* attention coprocessor (Rating 3)
- Apple-Omega *iVII* math SPU

Saeder-Krupp Cyberlogician: While not a leading light in cyberdesign, Saeder-Krupp was one of the first corporations to introduce a “cyberlogician:” metahumans employing extensive headware augmentations and supported by expert systems with incredible analytic abilities and preternatural efficiency, whether they are calculating stock rates or coordinating S-K units in the Desert Wars.

Cyberlogician suites are now available on the market in one of two options, civilian and military. The civilian suite consists of:

- Fairlight *Caliban* headware commlink (see p. 319, *SR4*)
- 3 NeoNET *GatOR* datajacks
- Cyberdynamics *Cranholder* sim module
- Cyberdynamics *Prodigy DOC v4.02* encephalon (Rating 2) and Math SPU
- Cyberdynamics *Eternity Seven* attention coprocessor (Rating 3)
- Cyberdynamics *Brainlock* data lock (Rating 6)

The military variant modifies the commlink for hot sim and adds an orientation system and a simsense booster to the components of the civilian version.

Urban Kshatriya: The Urban Kshatriya (named after the traditional warrior/noble caste in Hindu society) suite was developed in the back alleys of India’s Mangalore-Bangalore-Chennai high-tech hub. The local cyberdocs—tapping into the sprawls’ cutting edge R&D and medical research centers—lived up to their reputations by engineering one of the few marketable cyberware suites

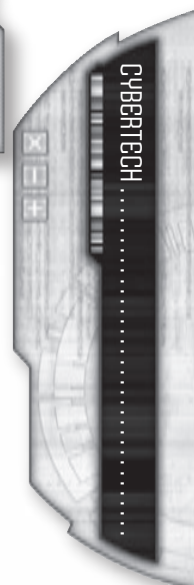
not developed in megacorporate labs. The Kshatriya suite is popular with street samurai and gillettes worldwide and consists of:

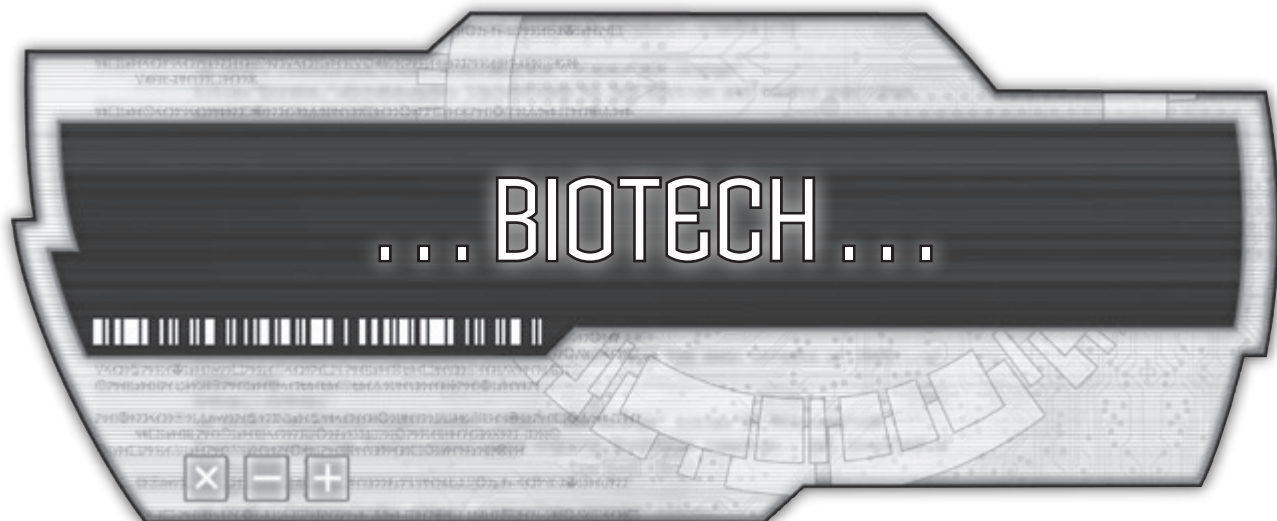
- Sony *Cybersystems TL317a* cybereyes (Rating 3) with eye recording unit, flare compensation, image link, low-light vision, smartlink, thermographic vision, vision enhancement (Rating 2), and vision magnification
- SpinX *Fastball Pro* reaction enhancer (Rating 1)
- Evo *Mantara* muscle replacement (Rating 1)
- Ares Biomedical biomonitor with adjusted and automatically-triggered auto-injector (reusable, containing up to 6 doses; supply costs not included)
- 2 Siegel *K3* retractable cyber spurs (one for each arm)

Zeiss SenseSation Line: The Zeiss SenseSation line has proven very popular with private investigators, media hounds and even forensic scientists due to the high-quality sense-enhancement package. Even professional negotiators and secretaries find the suite useful thanks to the ability to record proceedings in full vision and sound. It consists of:

- Zeiss *Uhu-229* cybereyes (Rating 3) with eye light systems, eye recording unit, image link, low-light vision, vision enhancement (Rating 3), and vision magnification
- Audiotek *Emperor C* cyberears (Rating 2) with audio enhancement (Rating 2), damper, ear recording unit, select sound filter (Rating 3), sound link, and spatial recognizer
- MetaType *Sensei* simrig
- Nightengale *All-Sight* radar sensor (Rating 3)

While the cyberears cannot accept any more upgrades, the cybereyes can be further upgraded with up to 3 additional Capacity points.





"All right, tusker. Let's see this stuff of yours," Kane drawled over his commlink. Seconds later a request popped up in AR to connect his commlink with another PAN, followed by another message from the doc.

"Got yourself a shitload of oro from a haul, eh? Selling out old friends again?" Her roaring laughter was broken by several grunts. "Here, southern boy. I just patched you into my system. Take your time. Buzz me if you see something you like. I have an appointment."

Kane instantly called up the menu of Butch's catalogue, discarding the bio-corp pop-up advertisements to cut down to the novelties. "AR mode or full simsense experience?" his commlink's automated sultry voice asked in the usual Mississippi twang. "The real deal, darlin'," he subvocalized.

In a blink he was underwater, swimming through the waves. The gear pulled oxygen out of the water and passed it to Kane just like he was out in regular air. To get a feel for the new 'ware he stopped the rush and spiraled up to the surface toward the sunlight. He felt the gills open and close, and he dipped a curious finger in the gill slits that now sat on his upper chest right above the lungs. An arrow popped up, pointing toward his shark skin and the denticles implanted there that gave him superior hydrodynamic properties.

The jade green Shiawase logo rose from the sea floor while a female voice spoke very politely. "Thank you for choosing Shiawase Biotech. The Shiawase Samebito™ package is for divers, marine explorers, treasure hunters, and other underwater operatives. The Samebito™ standard fittings include gills, hand webbing, diving eye modifications, and our unique shark skin for improved swimming capabilities, maneuverability, and scuba-free operations. The premium model you are currently experiencing is also equipped with enhanced olfactory implants and shark-repelling pheromone glands. If you want to order, please contact us or your nearby bioclinic. Shiawase Biotech—Advancing Life."

Kane had made his decision before the voice shut up. "Nah, this ain't me. I need something worth risking a trip to the butcheress." He dropped out of the simulation for a second, browsing the catalogue in AR mode.

He stopped at a clip showing a climber using a spider silk implantation. He shook his head in amusement. "Bio-gadgeteers read too many comics," he muttered.

Suddenly his eye caught the upgrade section promoting bio-addons. "Orthoskin upgrades?" A smile stretched across his scarred face as he dived into the next adsim to test the goods.

A few minutes later he came out and messaged Butch. "Alrighty, Doc. I got a hankering for these ortho upgrades. Be sure that you have some dragon hide around—the Most Notorious Man in the CAS is coming to see ya. That twenty percent markdown you promised to members of Jack P's still on?"





THE AGE OF LIVING TECHNOLOGY

Posted By: KAM

- Smiling Bandit pulled a few strings to persuade an old friend to throw us a few insights on what's current in the field of biotechnology. I think most of you may have heard of Dr. Kristine Martin's recent promotion as Chief Bioethics Officer to the board of directors of the Genesis Consortium.
- FastJack
- "A taste for irony has kept more hearts from breaking than a sense of humor, for it takes irony to appreciate the joke which is on oneself." (Jessamyn West)
- KAM

Biological organisms have evolved over billions of years, adapting to impossible surroundings and solving dazzling arrays of problems. Modern biotechnology has developed a great understanding of nature's toolbox and used it to push the metahuman body to its limits—and beyond. Where cybertechnology replaces parts of the metahuman body with artificial designs and gene technology changes the body at a fundamental level, biotechnology has developed a third way.

Biotechnology covers all the biological and quasi-biological enhancements people can buy to enhance their bodies and abilities. Biotech can alter or augment organs, tissue, and body parts in a way that is completely compatible with the organism's own workings while making changes that are beyond anything that the body could grow or develop on its own, even if the DNA were altered. A biotechnician must understand the "architecture of life" (i.e., the complex mesh of metabolic networks, feedback loops, and regulators that make up complex organisms) to be able to replace or enhance specific features of a living system. An organism is a complicated and sensitive machine—even small changes can have wide-ranging and catastrophic consequences.

While most people think of biotech as a less invasive technique that requires less wiring than cybernetic prosthetics and that can rely on the body's own infrastructure (nerves and blood vessels) to supply and maintain the altered or augmented organ, the alterations are often even more serious and less controllable on a molecular level.

- Which is why these cutting edge treatments and implants have side effects. Though the changes are natural in that the host's own cells die, replicate, or are somehow modified, the alteration is enforced by the biotechnological treatment. Hormone balance and biochemical regulation mechanisms can easily backlash on the patient and must be regulated by pharmaceuticals or bio-nanites. With all this, just imagine the damage an amateur in a gutterpunk bio-mod shop can do to your health.
- Nephrine

Even simple treatments involve a number of different biochemical, hormonal, immunological, or cytological procedures. Often, these treatments require the modification of cells at a genetic level, or the introduction of foreign genetic code. Without molecular biology and the tools of modern genetic engineering (nanites, virological vectors), most bio-modifications would not be feasible.

JACKPOINT USER PROFILE KAM [Temp Account]

- Guest account created by **FastJack (Admin)** 08/01/70
- Last updated by **The Smiling Bandit** 08/01/70

Name: Dr. Kristine Martin

Current Position: Chief Bioethics Officer, Genesis Consortium

Topics/Interests: Bioware, Biotech, Genetics, Life Sciences, Corps

Dr. Kristine Martin is an expert on biotechnology, bioware, implant technology, and genetic design. After her education, Dr. Kristine Martin—known online as KAM—went from the Biotechnology Centre in Sheffield (UK) to the Salish-Shidhe where she soon became an experimental bioengineering research leader for Universal Omnitech. She spearheaded a bioware research and development team at UO's headquarters in Vancouver and was responsible for the invention of the trauma damper in the early '50s. After climbing to an executive position at UO's major research site in the Tijuana sprawl in Aztlan, she was extracted by the Genesis Consortium where she ascended to the post of Director of R&D and was later promoted to the position of CBO to the Consortium's board.

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- The frugal runner needs to understand that bioware carries a higher price tag than cyberware. Bioware might be easier on the body, but it's harder on the cred account.
- Fatima
- That's doubly true if you've seen Butch's price list. Bioware does not come cheap, but given the choice between an electronic device and a vat-grown heart custom-made from my own cells, wetware wins hands down.
- Picador

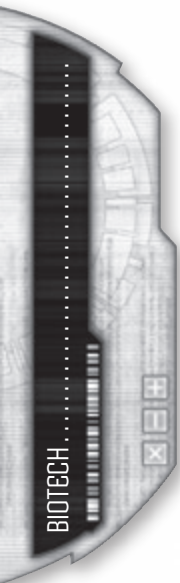
BIO-MEDICINE

The agricultural, food, and pharmaceutical industries weren't the only ones to reap significant benefits from the biotech boom. Medicine has also taken a great leap forward, particularly organ cultivation and transplantation, revolutionized first by cloning and then the utilization of type O implants.

Cloning: Me, Myself, and I

Clones and cloning are terms with a plethora of meanings in science lingo. When Joe Average speaks of clones in this day and age, he usually means a full-body multicellular organism that is a genetic duplicate of a single donor (i.e., a biological copy of an existing being).

Ever since forced-growth full-body clones—so-called *wimps*—became medical reality (though an awfully expensive one) in the mid-'40s, it became standard procedure to euthanize these clones and harvest them for vital organs for those clients



TRANSHUMAN SOCIETY DATAPOINT

Biotech Timeline—Fast Facts

1919— Karl Ereky coins the term “biotechnology.”

1977— Biotech is characterized by recombinant DNA technology. The prokaryote model, *E. coli*, is used to produce insulin, somatostatin, and other medicines.

1980— Patent for oil-absorbing bacteria by Exxon Oil approved by the US Supreme Court.

1988— First patented animal (the Onco mouse).

1994— FDA approves the first genetically-modified foods.

2003— GloFish, the first biotech pet, hits the North American market. Specially bred to detect water pollutants, the fish glows red under blacklight thanks to the addition of a natural bioluminescence gene.

2011–2020— Many metahumans draw on cosmetic surgery and experimental bioengineering techniques to remove phenotypical metatraits.

2018— The so-called “magus factor” is theorized, laying the foundation for the development of “mage-netics” research.

2025— First complete gender transition by bioengineering without assistance of cosmetic surgery.

2032— The discovery of the unique genotype of Owen Whiting revolutionizes organ transplantation and sparks a new interest in xenograft transplantation and biomimicry of non-human organs and traits.

2034— Type O organs developed by Shiawase are granted a patent by the Corporate Court.

Mid 2040s— Force-growth of *wimp* clones on a mass basis becomes feasible. First bioware augmentations are reported in military and security personnel.

End 2040s/Early 2050s— First mass production of commercial bioware and biotech products, spurring research interest and improvement of biomedical techniques.

2050s— Biotech giants subsume several major food companies; edible goods are produced mainly by biotechnological means. Most mass production foodstuffs are based on soy, lupine, krill, algae, and mycoprotein.

2061–2062— The SURGE phenomenon draws a great number of people to biotech clinics to remove changing traits or create cosmetic changes to appear as one.

2069— Symbionts reach the mass market.

who could afford it. Companies like DocWagon, CrashCart, and EuroMedis run cloning farms for their Platinum-level customers, in which wimps are kept in stasis, so that clients can be adequately supplied with replacement parts “on demand.”

- Most megas and biotech/genetech companies also possess similar facilities for high-ranking VIPs. Just in case anything, you know, happens. Think of that when the corp grunt decides to shoot through the extraction target you’re shielding yourself behind. It’s easy enough

for them to patch him up (if he’s high enough on the foodchain) as long as he isn’t too broken.

- Hard Exit

- Sometimes the clone is an easier target than the person itself, especially if what you need is to get past biometric safeties like fingerprint, ocular, or genetic scanners.

- Fianchetto

- Actually the legal implications are interesting. Under most systems wimps are *property* of the person that was cloned, but the medical corp has legal custody. Makes you think twice before changing medcare providers.

- Haze

While rumors of true doppelgangers, replicant spies, and full-clone soldiers make for entertaining stories, they are all the stuff of fiction. To my knowledge, no one has ever managed to successfully generate a clone with a useful brain (in containment). Part of the problem is that the development of the brain is influenced by learning processes in the growth period. Under enforced growth conditions (basically a combination of hormone cocktails and genetic therapy to speed through growth cycles), the brain is not able to keep up with the rest of the body, yielding an underdeveloped brain that cannot keep the body alive on its own. Even slow-growth clones exhibit mental disabilities and only an animal-level intelligence at best, likely due to lack of mental stimulus from being raised in storage. While there have been tests by my old employer UniOmni (and I’m sure other corps as well) to compensate for this by torpedoing the brain with compressed virtual input (mainly language and simulated motor patterns), hoping to delude the brain into experiencing stages of development, to my knowledge they have not been successful so far.

- What success they have had in developing clonal brains capable of higher mental functions has led to early developments in full cyborg systems—but more on that when I have the time. Even then, the brain is only capable of managing relatively simple mechanical and digital interfaces and still needs to be comparatively slow-grown.

- The Smiling Bandit

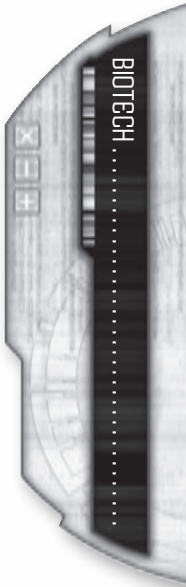
- One disturbing trend that has received little press so far are the corporate programs to raise entire generations of children that were created by *in vitro* fertilization and grown in an artificial womb, just as clones are. Proteus, for example, just graduated an entire class of genengineered metahumans whose only mother has been the corp. Creepy.

- Nephrine

The brain-growth barrier is one of the frontiers that will supposedly be cracked in the future. *Xenotransplantation* (the transplantation of organs from a critter into a metahuman) and hormonal anti-aging treatments that rejuvenate the body in a natural way and don’t do genetic “patching up” like Leónization are still hot topics in current biomedical R&D.

Therapeutic Cloning

Therapeutic cloning is a procedure that allows the cloning of specific body parts and organs to be utilized for medical purposes



BIODOC PRO NEWSFEED HEADLINES :: 08/07/70

Nightengale Clinics Special Price Offer

This month only, Nightengale Clinics are offering a special 10 percent price reduction for each additional bioware implant. Check our online catalog for our novelties and latest models like Shiawase Drillmaster™ Vocal Range Enhancer and UO Roughhide™ Symbiont.

[Read More.](#)

SpIn Carves Out Biotech Niche

With the Corporate Court Biomedical Agency's recent approval of non-cultured bioware generics developed by Spinrad Industries, SpIn is poised to carve out a stake in the burgeoning biotech market by offering common mass implants to bio-clinics, beginning next month. The clinical trials of their new bio-implant line were performed at the company's own Spin Shop clinics amidst allegations of data tampering by several competitors. [Read More.](#)

Evo Paves Way to New Sex Revolution!

Evo's new sexmorph bioware is about to change the world's mind—and bodies—when it comes to sexual identities. According to Evo's press release, in addition to diverse internal bio-modifications and an array of hormonal glands, the introduction of cutting-edge memory bioplastic implants now allows bioelectrical switching of functional sex within only a few hours. The smart materials alter body and facial contours (similar to Evo's Masquerade™ false front implants, albeit more advanced) and extend or retract organs to conform to male or female morphology. According to Evo, vocal range, skin, hair coloring, and growth or removal of hair can be adjusted with simple add-on treatments for full transformation. The new line's release has been delayed until later this year while it awaits further results from clinical testing and CCBA approval. [Read More.](#)

Haiu Biotek's OsseoFlex™ Implants May Face Recall

A recent civil suit decision in the CAS against Haiu Biotek proved the corporation used poor quality Taiwanese Synthelast in its OsseoFlex system. As a result, the articular capsules have been known to fail, snapping back to their correct position after being dislocated, leading to muscle cramps, inflammation, and pain in the affected limbs. The CAS court is considering a forced recall on OsseoFlex implants, but Haiu Biotek has already filed an appeal and countersuit. Meanwhile, it is suggested that implantees ask their doctor to check the system for overstress. [Read More.](#)

(rather than growing and harvesting a full wimp). Though research in this area diminished for some time after full-body cloning became widespread, the development and industrial production of bio-augmented organs (read: bioware) revitalized it. Thanks to advances in transgenic modifications and nanite-assisted cellular construction, the cloning of organs and even body parts such as limbs is now a medical reality. Cultivating an organ in a vat is still technically complicated, time-consuming, and costly, however, as it is easier to grow it in its natural environment (connected to nerves, tissue, and blood vessels) than in a tank that artificially simulates those elements and supplies the organ via an artificial cardiovascular system.

While common bioware implants are nowadays vat-grown, the setup has its limits. Cultured implants must be grown in environments based on the genotype of the host, which require significant cost and effort to set up. This is why such implants are usually more compatible with the recipient but also more expensive. For limbs, the technical demands are too high to cultivate just an arm when needed, and it is much easier to generate a wimp, speed him up to the right age with age accelerators and growth stimulants, then take what is needed.

- It's all a matter of money (like everything). Most of these treatments aren't affordable to "normal" people. One example: while vat-produced blood has been available for a long time, most patients cannot afford it (synthetic blood is way cheaper). This is why organ-leggers like Tamananous are so successful—they found a simple way to deliver products with low costs to a high-demand market.

- Hannibelle

Type O Transplants

Biotech R&D and bioware transplants were in the early stages of commercial exploitation in the 2030s when Owen Whiting was discovered. Whiting was a rarity, an individual who expressed none of the epitopes (protein and sugar structures on the outer membrane of organs) that can cause immunoreactions. His genotype was viable for 96 percent of transplants to any metatype, with a rejection factor of less than 5 percent. Identified and tested by Shiawase, Whiting's tissues became the basis for the type O (for Owen) implant and first-generation bioware modifications.

Nowadays, medical providers maintain farms of full type O forced-growth clones and vats of type O organs on hand, to be utilized as needed. This is also how many bioware providers grow and stock their augmented organs for mass distribution to bodyshops and surgical centers.

Future Frontiers

New biotech breakthroughs make the news every day, and megacorp R&D budgets remain bloated. Expect near future developments to come from the field of *xenotransplantation* (the transplantation of non-immunogenic organs from a critter into a metahuman). The growth of transgenic organs and bioware within an adult metahuman is also heavily-funded but much further from realization.



INCOMING FEED.....



BIOWARE

Bioware has evolved beyond its roots as a remedial technology, and it specializes in optimizing and augmenting the natural functions of organs and limbs beyond their natural abilities. In nature, organisms tend to evolve to a sustainable balance to occupy a given ecological niche. Not so with modern biotech. Many biotech organs and implants are genengineered and designed to exceed and replace metahuman performance levels.

Taking a different approach than enhancing existing metahuman biology, the field of *xenomimetics* focuses on analyzing the body chemistry and organs in non-metahuman species and deriving biotech analogs that are compatible with the metahuman body. Xenomimetic implants allow the replication of certain abilities non-indigenous to the metahuman body such as thermosensitive vision or color-changing skin.

A third branch of bioware development amalgamates classical bio-implants with synthetic biological materials (the kind Mother Nature hasn't come up with on her own). Orthoskin and bone density enhancements are prime examples, though more recently various polymer-lacing techniques have expanded the field with smart skin adaptation and false front applications.

Implants

Given its organic nature, the impact of bioware on the body's metabolism and integrity is significantly less than that of equivalent cybernetic implants. Off-the-shelf bio-implants smoothly integrate with any metahuman body and generally are not tailored to any particular individual, though metatype variations are obvi-

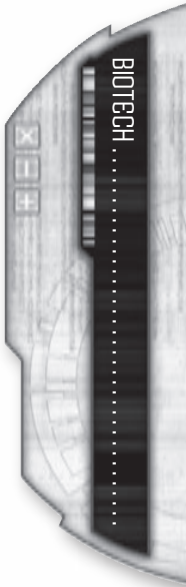
ously a consideration—take, for example, the sheer difference in scale between a human and a troll liver. The chances of graft rejection are minute since type O organs were introduced, and cultured bioware, by nature, is always 100 percent compatible.

- While the risk of rejection is low, the installation usually requires some minor immunosuppressant treatments to ease the transition. Traces of these treatments in the blood are usually the simplest way of determining whether somebody has recently received any biotech surgery, though the traces provide no details on what was done to the patient.
- Nephrine

Most bioware consists of organs and tissues vat-grown from genengineered cells using standard metahuman organs as templates. These are then treated during or after growth to alter and enhance their properties before implantation. Many biotechnological implants also require the training of a reflex after the medical procedure is completed to let recipients familiarize themselves with the augmentation.

Unnatural Selection

In the past ten years, biotech augmentation has been gaining popularity and stealing much of cyberware's traditional market. Most body enhancement clinics now offer bioware options, and these days any street doc or chopshop will be able to get their hands on everything except cultured bioware—for that, you need a vat-equipped high-end clinic.



(BIO)SHAPE UP OR SHIP OUT

Posted By: Butch

Cybernetic prosthetics were not originally developed for gun-toting cybercowgirls but as functional replacements for accident victims when limb cloning wasn't an option. Biotech, on the other hand, was never intended to simply replace faulty or non-existent organs and limbs—its goal is to make them better than the original.

Nature did a damn good job of designing organisms—functionally speaking—and there isn't a real *need* (in a biological sense) for augmentation. As our society evolves toward ever more inhuman standards of physical perfection and supermetahuman performance, there is a rising demand for improvement and augmentation. That's why consumer biotechnology is aimed at making you all you can be—and then some

Bioware has different advantages and disadvantages when compared to cyberware. Chrome is usually stronger and silicon wires faster, but flesh is more malleable. Meat is by far the subtler and infinitely more diverse material to work with. Another advantage is that bio-mods and bioware implants are usually undetectable except by intensive medical examination (unless their nature or design makes their existence glaringly apparent). Casual searches, quick X-ray scans and the like cannot discern the difference between an augmented organ and the original. Additional glands and organs, however, can be detected by detailed examination of MRIs or X-rays. Security systems at very high levels employ medical scanners capable of detecting even cultured bioware; fortunately, the cost of these systems prevents them from being widespread. The presence of some bioware implants can also be determined through sophisticated analysis of metabolic fluids such as blood, urine, or fecal matter, while the presence of others can only be confirmed through exploratory surgery.

- Assensing can also be used to identify bio-mods, though it takes a trained eye to make out the tell-tales in the aura.
- Winterhawk

Perhaps bioware's greatest advantage is its capacity for self-repair. If you don't overstress your system, there is no real need for a visit to the doc to tune the 'ware. Biological systems do that by themselves.

Biosculpting

In the '70s, being born ugly is no excuse for staying ugly, unless you're poor. Modern biotechnology can sculpt bodies like clay dolls, giving the Joe Average—not necessarily only wealthy clients—his preferred body shape, height, skin tone, hair color, and even sex. Sports and other time-consuming workouts, fat-burning diets, or slimming agents are for those who cannot afford anatomic bioengineering, called biosculpting or bio-modding (if you prefer the vernacular).

- It is also often referred to as cosmetic bioware, though the term is misleading since biosculpting is based on a variety of medical and biotechnological procedures. Biosculpting can handle just about any basic form of cosmetic surgery and a few others besides—but anything more drastic requires genetic phenotype alteration.
- KAM

Want bigger or firmer “naturals,” velvety and youthful skin, more hair (preferably in this season's color), or just the fatty spare tire removed? Check in for an afternoon appointment at your bio-clinic and a group of hormone specialists, biotech engineers, geneticists, and body sculptors will get the job done.

Changing the build or proportions of metahuman anatomy isn't more than a finger exercise to your trusty bio-modeler, and even complicated procedures are not a big deal in this day and age. Since “gendernauting” in each direction, neuters, hermaphrodites (both sex characteristics), and androgynes all became a cultural phenomenon (and socially accepted) in the late '50s, transgender bioshaping has experienced plenty of hype. The true challenges of biotech applications don't lie in the cosmetology market, however, though those customer treatments are the most profitable and very much in demand.

- The mobs know this more than anyone. They make a killing with their custom bio-modded sex toys. Whether you're at a Yak bunraku parlor or picking up *munecas* in Caracas, these girls and boys are sculpted for those who have a penchant for a certain look (or the look of a certain person). Ever thought about fucking Maria Mercurial? Well, you can—by lining some mobster's pocket, of course.
- Kat o' Nine Tales

Among some fringes of society—and I'm not talking just transhumanists here—there's a growing group of clients who want to change body features whenever they want without the necessity for a stopover in a clinic. These body chameleons blur the line between cosmetic bioshaping and true bioware implants, allowing faces, sim starlets, high-class whores, and undercover agents to adjust their builds and appearances in mere hours. It's specialized and restricted tech, but it's getting more and more common.

- Elastic faces and sexmorphs aren't the creepiest of those types. You should see the kinky shit they get up to in Hollywood. Welcome to the freak show.
- Dr. Spin
- Talking about oddities—heard of those four-armed changelings that appeared when the Ganges Awakened in '61? From what my contacts told me, Swiss bio-gadgeteers are still trying to find out how to copy the physiology and functionality of those Shiva arms. I wonder how long it will be until four-armed corporate stormtroopers are trying to kick my ass.
- Clockwork
- None of this should be surprising. Our kids grow up in a media-saturated environment, bombarded by impossible ideals of beauty and perfection. So they try to copy it—when they can afford it—running to the bodyshops as often as they can, craving that perfectly symmetrical face or immaculate skin that will make them happy. After they remove all the little flaws that make them unique, they become another one of those vaguely familiar composites of the last few years of media darlings.
- Fatima



- At least they pursue their own self-image, whatever it might be. Others aren't given that choice. Biosculpting isn't going to make you any less of a troll—not even radical gene therapy can do that yet, at least not without risking life and limb.
- 2XL

SYMBIONTS

Posted By: KAM

The latest innovation in biotech augmentation is a Latin American breed. The Genesis Consortium was the first major corporation to venture into this novel area of research, and it remains unrivaled despite efforts from biotech behemoths like Universal Omnitech and Evo.

- Universal Omnitech has even crawled into bed with Renraku to co-develop the Japanacorp's pioneering leech symbiont constructs for metahuman applications.
- Kia
- Don't buy into all the hype—Renraku is farther ahead than KAM makes out. I hear even her former employers at the Big A have licensed Renraku's genengineered leech constructs.
- The Smiling Bandit

The goal of livtech (an abbreviation of living technology) is to achieve a mutual benefit between two organisms coexisting in intimate association. *Symbiosis* is the correct term here for those who care, and it's a very common principle in nature. Not all forms of symbiosis between a *host*, the larger (macro-) organism, and the *symbiont*, the smaller (micro-) organism, are beneficial. Biotech symbionts are designed to exist in a balanced (mutualist or commensalist) relationship with their hosts; though certain designs show a propensity for developing a parasitic relationship when overstressed.

While most people are freaked out by the idea of carrying organisms this size with or inside them, symbiotic technology has been available for quite some time. Previous *ectosymbionts*, like chloroplast skin, chlorosymbionts, or bacterial symbionts, were microscopic and were incorporated into the skin's surface or the blood stream. The trend is moving toward macroscopic *endosymbionts* (a term generally shortened to "endosonts"), however, that live under the body surface of the host, including the inner surface of the digestive tract or the ducts of exocrine glands.

- Yuck! The idea of a tentacled something in my stomach gives me the creeps. What if the thing decides to crawl out or start a family?
- Kane
- Oh come on, ya spineless toad. What was your mother on when she had you in the womb? Symbionts are task workers, not aliens.
- Butch
- Agreed. They're not even higher-level organisms. Most endosont designs are based on leeches, tapeworms, and other helminthes. They augment the body in a certain way in exchange for basic nutrient supplies that keep them alive. They will never, *ever*, start talking.
- KAM

- To the best of my knowledge, there are a few so-called "lower organisms" in the *Infierno Verde* in Amazonia that show some kind of sapience in the form of plant intelligence—proteans also come to mind. And let's be honest about this—your new masters have been experimenting with neuronal parasites and paracritter genes to invent the next generation of "smart symbionts." Falling back into old habits, doctor?
- The Smiling Bandit

Symbionts were originally invented as medical aids to ease a variety of ailments in non-invasive ways. Accelerated healing, anti-adiposis cures (so-called slim worms), nutrition controls, and the removal of toxins or pollutants from the body are all possible with today's living technology. There has been an increasing demand for livtech in other applications, especially as it has been shown that you can "teach" symbionts certain reactions to biochemical changes in the host, spurring them to deliver certain substances (hormones, pharmaceuticals) they produce into the bloodstream like a programmable chemical gland or living autoinjector.

- This is called symbiont education. Teach a tapeworm to run a maze, cut it up, and feed it to other tapeworms, and suddenly they can run the maze too. Very cost effective.
- Nephrine

MASS BIOTECH

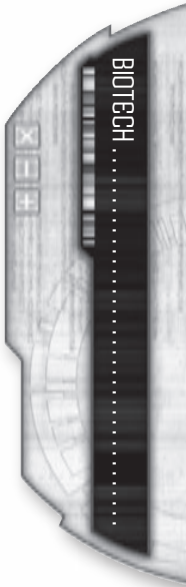
Posted By: Nephrine

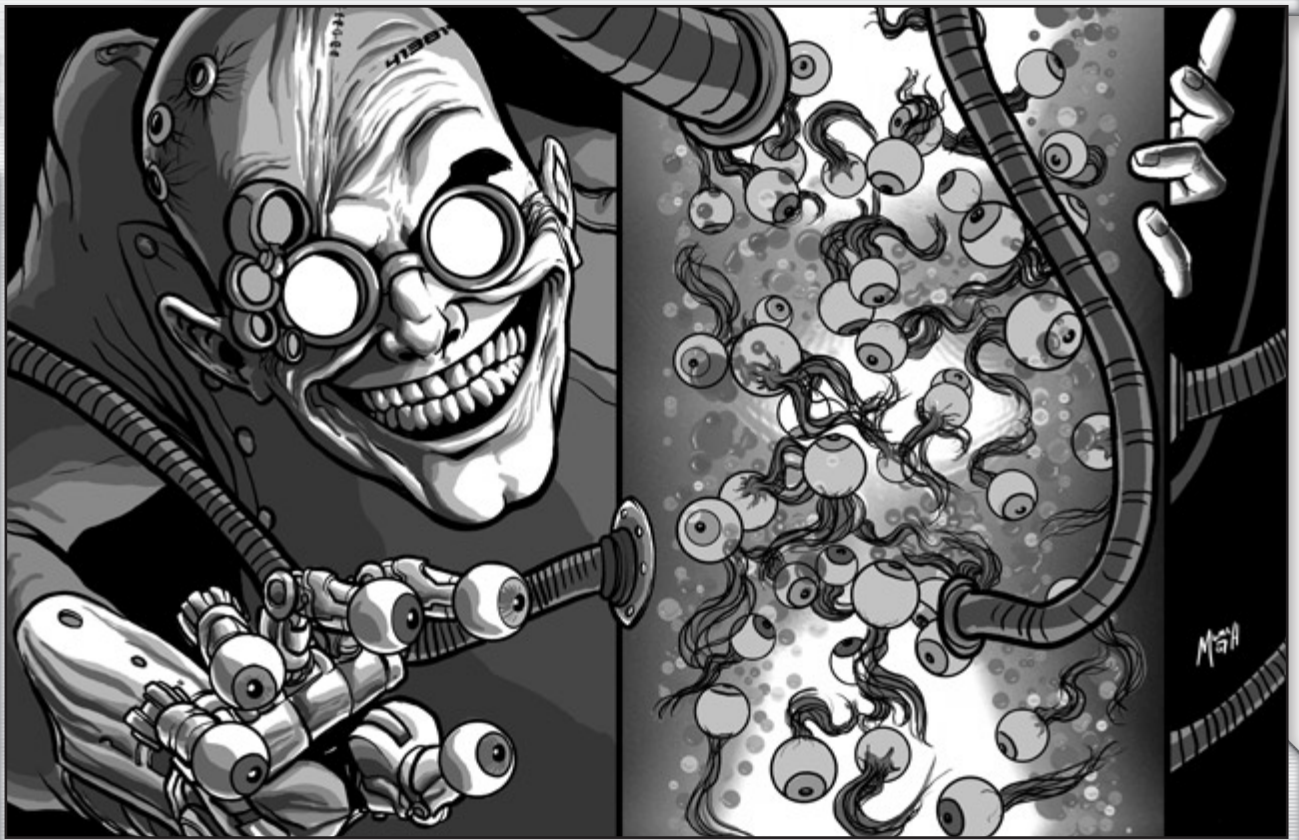
Mass or industrial biotech, though the most omnipresent form of biotechnology (as KAM already pointed out), is rarely in the spotlight as it deals with the boring aspects of industrial or agricultural applications.

White Biotechnology

White biotechnology (sometimes called gray biotechnology—don't ask why) is biotechnology applied to industrial processes. An example is designing an organism to produce useful chemicals or pharmaceuticals. White biotechnology tends to consume less in resources than traditional processes when used to produce industrial goods. Certain reactions and compounds would not be possible if biocatalysts had not evolved so far that they can be easily implemented in microorganisms in a building block-like manner to facilitate certain reactions. Though microorganisms are widely used in chemical processing plants, their range of reactions is limited. Higher organisms have advantages here, especially when it comes to complicated medical drugs (complex organic compounds and proteins that are modified with fatty acids, sugars, and the ligands bacteria cannot produce). Plant factories (*plantfacts*) and *fabricows* are often grown or kept on modern biotech farms to produce a certain synthetic compound instead of a natural product like tobacco or milk.

- Our team was recently hired to abduct a specific cow from a nondescript farm in Snohomish. The extraction was a piece of cake, but when we were heading to our meeting with the Johnson, Azzie corp lads were suddenly all over us to rescue their property. Turned out that it was a fabricow with mammary glands for a prototype compound in her udder.
- Pistons





INCOMING FEED.....

- There are still some holy grails of white biotechnology to crack, like the bacterial production of oil and gasoline. With more and more oil and gas wells drying up even in the Middle East and Russia, industries are forced to make the decision whether to stick with oil or invest in new energies.

- Snopes

Green Biotechnology

Originally, green biotechnology was a synonym for agricultural biotech. While the production, use, and augmentation of genetically-modified cultivated plants and symbiotic fertilizers belong in this field, food isn't the only sphere it covers. Today, green technology mainly deals with biomaterials produced by engineered organisms (often referred to as bio-machines or *Pods*). Whether they are used for food or producing consumer goods (such as clothing or cosmetics), construction (termite synthcrete, bio-domes, and coral towers), or security (biofiber, FAB bacteria) is no longer of importance. While clean energies like cold bioluminescence and organic bioreactors (or batteries) have also been a prime target for a very long time, biotechnology has yet to produce anything particularly efficient except photosensitive materials for solar collection.

- One has to understand that "green" does not necessarily mean eco-friendly. Pods have a strong impact on the environment, often not to its benefit. Wheat was never designed to grow in deserts or polar regions.

- Ecotope

- Well, until a couple weeks ago.

- Slamm-O!

- Utopian cities where environmental improvement is achieved through biotech are already becoming a reality. Just look at Manaus in Amazonia and Asunción, "the Living City," in Paraguay. Buildings in Asunción are made of biomaterials and artificial hardwoods that collect solar power and rainwater and scrub carbon and pollutants from the air. The city's recycling and sewage cleaning turnover is astonishing. Manaus is even more amazing with its "techno-organic" amalgamations.

- Glasswalker

- Don't forget that these cities can make their utopia because there isn't that much pollution around them to begin with. These bionic towers with all their biotech gadgets could easily succumb to high levels of pollution when built in cities like London or Tenochtitlan. I don't even want to imagine what happens if those organic towers start to fester or mutate.

- Snopes

Sometimes the organism itself becomes the product. Designed and bred pet-hybrids, nicknamed *chimeras* (a misnomer, but still commonly used), and so called "week trees" (bonsais or other miniaturized plants that grow in one week) are all the rage among the rich and famous. Breeding is not restricted to domestic animals and fabricows either. Parashield (an MCT subsidiary)

breeds, trains, and augments animals and paracritters like hellhounds and cockatrices to serve as guard animals.

Today, the challenges of green biotechnology lie in enabling environmental changes on a macro-level. Green bioremediation technologies are exploring the potential of using bacteria and plants to detoxify polluted soil, water, and air, as well as using fungi or algae to filter or desalinate sea water. While recent developments in these new technologies show huge promise, regional ecosynthesis or planetary-scale terraforming are still light years off.

- It's a matter of time. Both Evo and Proteus are toiling away on projects to "green" Mars at some point in the future.
- Plan-9

- *Omae*, they've already started.
- Orbital DK

Bridging the gap between white and green biotech are some of my favorite unconfirmed rumors on the science geek feeds. These range from the assisted breeding projects for dragons and endangered parasppecies to the development of neurocomms—biological commlinks that can directly interface with neural tissues. While there's undoubtedly research into the most exotic applications, claims of breakthroughs in these particular areas should be taken with a grain of salt. Biotechnology has achieved a great deal in the past hundred years, but there remain applications that are little more than science fiction.

BIOTECH KINGS AND KING-MAKERS

Like the pharmaceutical industry, biotech companies take the long view. No matter how much illegal experimentation and lobbying of authorities occurs, the introduction of new biotech procedures and implants is a slow process and it often takes years before they hit the market. With the increasing demand for advanced biotech procedures, metahuman enhancements, and biomedical aids, this is a no-holds-barred ultra-competitive and lucrative field where the top dogs are megacorporations with their own biotech divisions and huge R&D budgets.

Universal Omnitech

Coming into its own as one of the most prominent and powerful AA megacorps, Universal Omnitech remains at the very top of the biotechnology pyramid, continuing to churn out some of the most impressive developments in biotech R&D. Universal Omnitech's researchers define the current state of the art when it comes to bio- and genotech, whether it's developing new products or licensing the rights to new applications and procedures.

UniOmni has invented half of the bioware implants on the market and continues to move from strength to strength. Even the split with its former distribution partner, Aztechnology (following Aztech director Thomas Roxborough's defection), hasn't



threatened its dominant position. In fact, the merger with macro-engineering goliath DeBeers Omnitech has only diversified and enhanced its interests.

- Think your ex is still smarting, KAM?
- The Smiling Bandit
- Know so. I still owe you one.
- KAM

Shiawase Biotech

Historically the first provider of custom bioware implants, Shiawase is the most diversified biotech company due to its sheer size. Since Shiawase's biotech division was the foundation of the corporate empire, the corp maintains a hand in nearly every aspect of the field. Despite a history of innovations, however, Shiawase's approach is rather conservative; both their production and R&D initiatives are profit- and market-oriented rather than risking to venture into new fields. This is the primary reason why they are still one step behind Universal Omnitech, following them into the markets that they created instead of creating their own.

Genesis Consortium

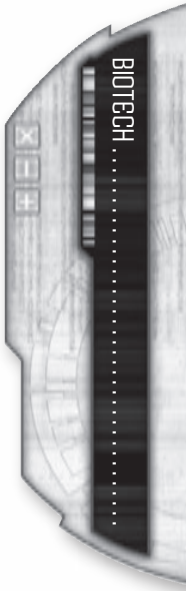
Genesis is purportedly an eco-conscious Latin American corporate consortium. Following the vision of true symbiosis between technology and nature, Genesis mainly develops new technologies (so-called living or organic technology) based on existing natural models and the fusion of organic and synthetic manufacturing. The Consortium's main branches deal in ecological biotechnology and xenobiological breeding and engineering, including symbionts. They've made a killing with several variants of sucrochemical production, such as producing plastics and polymers from plants and microbes rather than fossil fuels.

- Genesis is very chummy with the Amazonian government, in big part due to their green agenda, and as a result they have some interesting leeway when it comes to studying and taking samples from the abundant paranormal flora and fauna of the Amazonian rainforest.
- Glasswalker

Evo

People tend to overlook how much Evo keeps up with the biotech pack. Their focus lately seems to be expanding their biotech health and consumer services, bringing bioware directly to the people.

They've also made a splash recently by constructing a number of vertical hydroponic gardens smack in the middle of major sprawls. They are also heavily invested in new lines of research,



of course, particularly when it comes to synthetic biology and metatype-specific bioware. Personally, I'm looking forward to seeing what new lifeforms and adaptations they develop for their Martian colony interests.

Proteus AG

Proteus is mainly involved in mass biotechnology, particularly white biotechnology. Known for huge underwater operations and assets (the so-called partially-submerged arkoblocks), Proteus is spearheading the subfield of marine biotechnology (sometimes called blue technology) that deals in underwater farming, sea life, and biotech adaptation of terrestrial life to the sea and vice versa. Because of their occasionally esoteric biotech research avenues with a focus on the adaptation or evolution of metahumanity, they are rumored to conduct a lot of unethical metahuman experimentation hidden inside their arkoblock fortresses.



- Evo and Proteus have a long list of rival interests, and lately it seems there's been an escalating shadow exchange between the two. Proteus seems to be taking a heavy interest in the green biotech technologies used in Evo's Saotome Aquadomes, probably for use with their own future arkoblock concepts. Meanwhile, Evo's investigating Proteus's recent exowomb developments.

- Kia

Yakashima

Yakashima continues its pattern of steady growth in the agri-biz, sea-farming, and biopharm industries. True to its history of hostile takeovers, it swallowed a number of minor biotech firms following the crash, though the process of digesting them all seems to have slowed it down a bit. They've had some market hits as a result, however, with disease-resistant nutricrops and chimerical plants. Recently it's had an eye on some of Evo's clone farm subsidiary backbone operations—expect things to get ugly if Yakashima decides to make a move, as they don't shy away from fighting dirty.



Aztechnology

Aztechnology feeds a significant portion of the world with their genengineered crops, seafood, and vat-grown foodstuffs. They also manufacture an impressive array of consumer biotech goods, from eco-friendly cleaning products and diet pills to living furniture/decor and water biofilters.



They also continue to dominate a large chunk of the cosmetic bio-mod market, as well as contraceptives and sexual aids. Their research into domestic bacteria products—for household cleaning and uses, natch—is likely to spawn some new consumer trends soon.

Meridional Agronomics

Renowned primarily for its agribusiness division dealing in genetically-modified crops as well as soy and alternative foodstuffs, this Spanish AA is an expert in green biotechnology, especially pharmed livestock and transgenic crops that respond to their licensed biotech procedures and specially-designed phytohormone cocktails.



Tan Tien

Though just a third-tier corporation by megacorporate standards, Tan Tien maintains their edge on the market by licensing the creative output of their biotech R&D labs to bigger corporations. Thanks to three recent major deals with their top customers/partners—notably Spinrad Industries, Zeta-Impchem, and Eastern Tiger's Haiu Biotek—Tan Tien recently extended the assets of their Sentosa Island arcology in Singapore to form the Biopolis Biotech Cluster. Their biotech division mainly focuses on new processes for industrial biotechnology rather than bioware implantations.

Implant	Essence Cost Multiplier	Availability Modifier	Cost Multiplier
Second-hand Bioware	1.2	-1	0.5
Biosculpting	Essence	Availability	Cost
Minor Modification	0	4	100–2,000¥
Moderate Modification	0.1	6	1,000–5,000¥
Severe Modification	0.3–0.5	6–12	10,000+¥
Metatype Change	0.3	8	25,000¥
Sex Change	0.3	6	20,000¥



ADVANCED BIOTECHNOLOGY RULES

Biotech continues to grow in popularity as the “natural” alternative to cyberware. Increasingly available through bodyshops and medical centers, corporate bio-engineers are hard at work on new generations of bioware implants.

The following rules build and expand on the rules given for bioware starting on p. 338, *SR4*.

BIOWARE GRADES

Like cyberware, bioware is available in varying quality and availability. The most common off-the-shelf bioware is type O and is roughly matched to the patient’s size and metatype. By its nature, neural bioware—aka cultured bioware—must be matched to the patient’s physiology, particularly his brain and nervous system. Likewise, higher-quality bioware (alpha, beta) is tailored more closely to individual biological systems and protein matched to existing tissues. The highest quality bioware (delta) is vat-grown from a cellular matrix containing the individual patient’s own DNA, custom-made just for them. Rules for bioware grades (alpha-, beta- and delta-grades) appear on p. 303, *SR4*, and *Installing/Repairing Cyberware and Bioware*, p. 126.

SECOND-HAND BIOWARE

Also called “clearance” bioware so as not to disgust the bargain hunters, second-hand bioware is a growth market. While second-hand organs and implants are sometimes available from the original owners, this is less common than cyberware and bioware acquired from corpses or through other nefarious means. Specialized underworld operations such as Tamanous and the Body Bank deal as much in natural organs as in bioware. Only basic bioware can be found second-hand—alpha or better grade and cultured bioware are by definition protein-matched and cannot be implanted in another body. Apply the Essence Cost, Availability, and Cost modifiers to the second-hand implant as noted on the table below.

BIOSCULPTING

Biosculpting is a medical specialty that combines plastic surgery, body shaping, cosmetic alteration, and bio-implants. Throughout history, (meta)human social behavior and insecurities have been profoundly linked to personal appearance and ideals of beauty, and in 2070 physicians gained the tools that allowed them to make the metahuman form as malleable as clay in the right hands.

Physical appearance can be changed without cost in Essence so long as the character’s body retains the same neural connections, basic size, and function. A man with dark skin can be transformed into the same man with pale skin, ears can be elongated or rounded, epicanthal folds can be removed, and eyelid creases added all without Essence loss. On the other hand, a sex change, the repositioning of the eyes to stalks, or the addition of a tail would all cost Essence. Essence losses from biosculpting are tracked as part of the character’s total bioware Essence losses (p. 84, *SR4*).

So many biosculpting options are available that it would be impossible to list them all here. Instead, we have grouped them into Minor, Moderate, and Severe categories. The gamemaster determines what category a particular cosmetic change falls into.

BIOSCULPTING SOCIAL EFFECTS

Beauty is truly in the eye of the beholder, and sexual ideals vary with culture, metatype, and time. As always, different societies and even different groups within society have different perspectives on beauty and what are acceptable standards in appearance. Social standing also figures into the mix. Access to body sculpting and cosmetic surgery creates a huge “beauty” gap between the haves and have-nots. Anyone who can afford it can be attractive, whereas the poor people have to run with what they’re born with, or can only pay for cheap cosmetic surgery.

Different cultures also have different standards. Tir Tairngire crooner Gildrimel’s love song *Fairy Girl* competes for the number one spot with Los Angeles Orxstar Kaniball’s *Room for a Litter*—two songs espousing feminine ideals of sexual attractiveness that are impossible to reconcile.

The gamemaster may decide whether biosculpting and cosmetic bioware have an impact on any given social situation by applying modifiers as appropriate (see *Body Mods and Social Interactions*, p. 20). Also keep in mind that while it is entirely appropriate for characters to gain a +2 dice pool bonus to Social skill tests for being romantically attractive to some NPCs (see p. 122, *SR4*), it is important to remember that such a bonus also makes a character more memorable and there is literally nothing that a character could do to their body that would make them attractive to all the people all the time. These dice are good for first impressions only; they wear off with time.

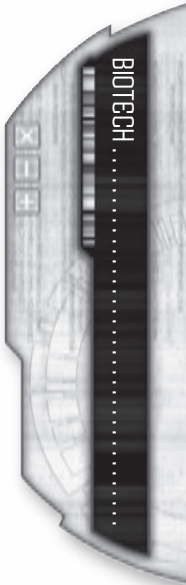
Costs can vary dramatically, and may also depend on the specific surgeon’s reputation or standard clientele, and so are also under the gamemaster’s purview. Several specific biosculpting mods are also noted below.

Biosculpting and cosmetic surgery use the standard surgery rules for *Cosmetic Surgery/Biosculpting* found on p. 33.

Minor Modification: These cosmetic changes typically involve a mere injection, removal of fat layers, or similar light procedures. Fuller lips, nose jobs, hair transplants, ear tucks, liposuction, decorative scarification, fingerprint removal, and smaller or larger breasts are all considered minor modifications, requiring only light cosmetic surgery. Some of these procedures can even be performed by hormone cocktails rather than surgery.

Moderate Modification: Moderate biosculpts require more extensive changes and surgery. This can include extensive face or head reshaping (i.e., making your face look like someone’s who roughly has the same head shape), the breaking and resetting of bones, and/or minor cosmetic biotech implants. Typical moderate modifications would include altering apparent ethnicity, giving a face an anime idol appearance, sanding down troll dermal deposits, or replacing hair with feathers.

Urgent Message...



Severe Modification: Cosmetic surgery and biosculpting on this scale completely change the appearance of the recipient. With this procedure, anybody can be made to look like anybody else, including altering the height of the person by adding or removing leg- or upper body length. Other options might include adding dog ears, vestigial wings, or a tail.

Metatype Reassignment: With this procedure, any elf, human, or ork can have his body sculpted to resemble an elf, human, or ork, thus resulting in a metatype poser. Only the looks of the character change; genetically, his original metatype will still be readily identifiable. The changes are purely cosmetic; no metatype bonuses or penalties are obtained with this treatment.

Sex Change: The most dramatic of body sculpts, this modification removes the character's original sex characteristics and replaces them with that of the opposite sex, both, or neither. A hormonal treatment rounds out any plastic modifications. The character's new sex is fully functional, but he or she is not fertile. The changes are, at least initially, purely physical. The hormonal balance also changes over time, however, so the recipient's behavior may gradually alter as a result of this operation.

COSMETIC BIOWARE

Cosmetic bioware is the natural complement to biosculpting, using bioware implants and transplants to help transform the metahuman form to the client's desired ideal. Cosmetic bioware usually involves less preparation than normal bioware, as few implants are very complex or invasive, even if cosmetic remodeling is part of the procedure. For cosmetic bioware, use the standard bioware implantation rules (p. 126).

The following bioware implants are used by themselves or in conjunction with bodysculpting techniques. These bioware implants are primarily meant as roleplaying tools for fleshing out characters, and few offer benefits in terms of game mechanics.

Chameleon Skin: This skin pigmentation enhancement comes in two varieties, both of which work like its namesake. Standard chameleon skin changes color only when exposed for a prolonged time to a background with sharp contrasts, like colorful patterns, and it retains the new color for up to four hours. When not exposed to a pattern, the skin resumes its normal hue. Dynamic chameleon skin, on the other hand, changes its color slowly with the background as the character moves. Unless the character is mostly nude, however, this does not translate into any

benefit for Infiltration Tests, and even nude characters only receive 1 bonus die (3 if they remain completely motionless). Chameleon skin is incompatible with dermal sheathing.

Clean Metabolism: With a series of alterations to the recipient's exocrine glands, liver, and pancreas—and the addition of tailored bacteria to the intestines—this bioware more efficiently digests food and drink. The main effect is that most of the more embarrassing and unpleasant effects of the digestive system are eliminated. Users rarely develop body odor, belch, or pass gas. Even the person's sweat and bodily waste are sanitized. This treatment is popular among high-society players and trendy types who wish to avoid a social faux pas. Clean metabolism is not compatible with digestive expansion (see p. 338, *SR4*).

Chloroplast Skin: This treatment introduces chloroplasts into the recipient's skin cells that turn the skin green. Chloroplasts engage in photosynthesis, a chemical reaction in which sunlight, water, and carbon dioxide help create glucose and oxygen. Even when the character's skin is fully exposed, this process only creates enough nourishment for the recipient to supplement his diet, but not replace it. The overall level of physical well-being and energy is increased, however. If the character is fully clothed, the effects of the photosynthesis are negligible. Chloroplast skin is incompatible with chameleon skin, orthoskin, or dermal sheathing but compatible with other skin treatments.

Dietware: Dietware is for those image-conscious people who don't want to worry about gaining weight or losing their figure. It consists of a series of gastrointestinal tract modifications that limit the amount of food that is digested, in proportion to the user's metabolic rate. It ensures that no excess carbohydrates and proteins are created and converted into fat. In essence, recipients won't pick up any extra pounds—no matter how much they eat. Dietware is not compatible with digestive expansion.

Hair Growth: Hair and fur can be grown in excess or in unusual spots by treating the dermis skin layer to nurture hair follicles. The texture, color, and thickness of the hair can be chosen in advance, allowing for a wide range of options—from a long green mane to a nice coat of leg fur so the user can wear shorts in the winter. Whiskers are a current favorite among the club scene. If the hair that is grown serves a certain purpose, for instance an otter-like pelt to protect the user from unprotected immersion underwater or a layer of hair for use in cold environments, the costs triple. At the gamemaster's discretion, this kind of biomodi-

Cosmetic Bioware	Essence	Availability	Cost
Chameleon Skin	0.2	6	4,000¥
Dynamic Chameleon Skin	0.2	8	7,000¥
Clean Metabolism	0.1	4	2,500¥
Chloroplast Skin	0.1	4	2,500¥
Dietware	0.1	4	2,500¥
Hair Growth	—	4	500¥
Sensitive Skin	—	4	2,500¥
Silky Skin	—	4	1,500¥
Skin Pigmentation + Biotattoos	—	4	1,500¥



fiction may add 1 die to an appropriate skill test (for instance, a Survival or Swimming Test). Full body pelt modification can lead to negative dice modifiers in Social Tests that involve appearance. Each treatment covers a region of skin approximately the size of the human head.

Sensitive Skin: The number of nerve receptors in the skin's dermis layer can be increased with this process, slightly heightening the recipient's sensitivity to heat, cold, pressure, and pain. The actual sensitivity change is minimal. It's not enough to cause increased damage, but it provides just the right tactile difference to satisfy pleasure-seeking hedonists. Sensitive skin is incompatible with orthoskin and dermal sheathing.

Silky Skin: The Silky Skin procedure is a two-step process that first removes skin blemishes and scars by laser surgery and then immerses the recipient in a nutrient vat to grow an improved, smoother top skin layer with reduced pore size. The end result is silky skin that is perfect to the touch and flawless under the scrutiny of high-resolution cameras, making it a favorite among models and actors. Silky Skin is compatible with all other skin treatments. It is not self-restoring, however, so new scars and blemishes can form after the treatment, and it is somewhat vulnerable to prolonged exposure to harsh conditions (such as extremely hot and humid environments, like jungles, or abrasive surroundings, like deserts). Silky Skin does not remove tattoos of any kind, as those lie below the skin layers that are modified with this treatment.

Skin Pigmentation and Bio-Tattoos: By altering the amount of melanin in the skin and by introducing other natural pigments, metahuman skin can be altered to take on a wide range of colors—from pitch black to bright red to bone white. The entire body can be colored, or just selected areas. The art of bio-tattooing is gaining popularity, especially with folks who want specific designs colored into their skin. Pigmentation applied in this way doesn't fade over time, though bio-tattoos can be designed so that they change slightly over long periods. Bio-tattoos known as glo-tatts add modified epidermal cells to the skin. These cells possess the luciferase enzyme which produce a mild bioluminescence when exposed to an activating agent (costs of the agent aerosol are negligible). The iris of the eye can also be altered in this manner, though this option is not compatible with cybereyes. This bioware is incompatible with chloroplast skin.

NEW BIOWARE

The following options greatly expand the biotech personal augmentations available to characters in the Sixth World.

Standard Bioware

Echolocation: The metahuman body has a natural ability to analyze sound waves reflected from nearby objects to build a composite “image” of their surroundings in a manner similar to, if significantly weaker than, a bat's. In most people, this ability is underdeveloped because they rely primarily on their eyes. This bioware enhances the nerve strands required for echolocation; recipients typically train to use their advanced sense in a two-week-long speed-learning course.

The echolocation augmentation provides the user with a simple form of acoustic sensing that, contingent on the volume of the noise the character uses for detection and background noise volume, allows the character to make out general shapes, sizes, and distances to objects—building a “low resolution” image



of his surroundings. The range of the spatial perception is also limited; in a quiet warehouse, a tapping cane is loud enough to sound out most of the warehouse, but on a crowded street, the same tapping cane might be good only for a 5-meter perception radius. Echolocation can pick up things otherwise invisible to the naked eye, such as glass walls or opponents cloaked with Invisibility spells. Ultrasound is not necessary for the use of this implant—simple clicking noises with the tongue or the sound of hard heels on the floor will suffice. Ultrasound, however, increases the range and quality of perception.

If combined with the vocal range enhancer (p. 67) and hearing enhancement (p. 65) implants (or their cyberware equivalents), with a little training this augmentation functions like a true ultrasound system (p. 324, *SR4*).

Elastic Joints: This treatment replaces the articular capsule of all major joints with an elastic biosynthetic material that is substantially more robust. At the same time, the socket hold and nerve density are slightly reduced. The net effect improves the ease with which a joint can be dislocated and replaced into its socket, resulting in amazing flexibility and feats of contortion. The recipient receives a +2 dice pool modifier to all Escape Artist Tests and to all attempts to escape grappling. She can also pass through openings that would normally be too small for a person of her size, or remain comfortable in spaces that are too small. This modification is not compatible with enhanced or smart articulation augmentations.

Enhanced Pheromone Receptors: While cyberware can provide implanted gas analyzers of high sensitivity to improve scent abilities, this biomod combines a boost to the neural pathways between nose and brain with a higher concentration of scent receptors, providing a more intuitive, high contrast sense of smell. This enhances a metahuman's innate ability to discern and react to individuals by scent, as well as detecting basic emotional cues (fear, anger, lust) from smells.

The recipient can learn to identify individual people and animals by smell and can detect basic emotional states. Add the enhanced pheromone receptors' rating to any Perception Tests involving smells and people or animals. Also add half the rating (round up) to any test involving social interaction; this bonus only applies if the recipient can smell the person or people he is interacting with. Strong odors (such as perfume) may diminish this ability, or even confuse it if a glitch is rolled. Additionally, recipients may experience extreme discomfort in crowds due to the overwhelming amount of odors. They suffer a dice pool penalty equal to half the receptors' rating (round up) to all tests due to the strong distraction. A respirator reduces these penalties by its rating.

Tailored pheromones provide twice their normal bonus against the recipient, and if the recipient also has an adrenaline pump (p. 338, *SR4*), the pump may be set off by other people's smell of fear, anger, and lust—roll a Composure Test, subtracting half the receptors' rating (round up).

Extended Volume: An average adult's lungs contain approximately 2.5 liters of air. The actual tidal volume, however—the amount of air that enters and leaves the lungs with each breath—is only 0.5 liters. By augmenting the amount of flex in the diaphragm, it is possible to increase the tidal volume, thus increasing the efficiency of gas exchange and enhancing stamina.

Extended volume is available in a rating from 1 to 3. An average adult can hold his breath for approximately 48 seconds (8 combat turns, see p. 119, *SR4*). Each rating point of extended volume increases that amount of time by an additional 48 seconds before having to take a Swimming + Willpower Test.

The character may also add the extended volume rating in dice to any dice pools for resisting fatigue, such as from running, swimming (see p. 155, *SR4*), or treading water (p. 119, *SR4*).

Gecko Hands: For this modification, millions of tiny hairs are grafted into the recipient's palms. These hairs allow the character to adhere to any surface he touches. The individual bond between hair and surface is insignificant, so that the character can remove his hand from whatever he is touching by peeling it off the surface. The hairs allow the character to attach firmly to anything: glass, plastic, concrete, steel, walls, ceilings, weapons. Liquid covering the surface does not reduce the interaction strength; the character can climb a wet glass wall as easily as a dry one. Loose debris on the surface or thick slippery coatings, like sand or grease, however, nullify the effect of the gecko hands.

During everyday life, the gecko hands are typically covered with a thin layer of plastic to prevent the recipient from sticking to everything he touches. The recipient can remove the cover by gradually peeling it off. Solvents and water have no effect on the efficiency of gecko hands, nor do they help to remove objects stuck to them.

A character with gecko hands can climb across any surface as if it was broken and he was climbing with assistance, though he never counts as rappelling. Even a critical glitch will not cause him to fall. The character cannot be disarmed or forced to drop anything he is holding short of prying his hands open and peeling off the item. Dropping an item is a Simple Action for the character and requires two hands, or a Complex Action if both hands are occupied. The character receives a +2 dice pool modifier to any attempt to grapple or subdue. The treatment cannot be applied to cyberlimbs or to feet, since feet are not flexible enough to gradually remove them from the surface and undo the sticking. If the recipient somehow increases the flexibility and dexterity of his feet



Bioware	Essence	Availability	Cost
Echolocation	0.1	8	15,000¥
Elastic Joints	0.3	10	15,000¥
Enhanced Pheromone Receptors (Rating 1–3)	0.1	10	Rating x 5,000¥
Extended Volume (Rating 1–3)	Rating x 0.1	4	Rating x 4,000¥
Gecko Hands	0.1	6	12,000¥





INCOMING FEED.....



to the necessary level, he can apply the gecko hand treatment to his feet as well, gaining all the climbing bonuses, as well as receiving +3 dice to all tests that involve balance or being pushed over.

Gills: A pair of gills is implanted in the user right above the lungs. The recipient can now breathe water and air, but due to the reduced size of the gills, water breathing is less efficient. The recipient can no longer drown, but suffers a -2 dice pool modifier to tests determining when Fatigue damage sets in when breathing water. Gill efficiency can be improved at the cost of lung reduction. At the first level of improvement, the penalty for water-breathing is reduced to -1 die, but the user now suffers a -1 penalty to these tests in air. The second level of improvement removes all water-breathing penalties, but the lung volume has now been reduced enough to cause a -2 dice penalty. All levels of gills are compatible with extended volume, but the extended volume benefits still only apply when the user is breathing air. All levels of gills have the same cost and essence cost.

Hand and Foot Webbing: By adding bio-grown skin folds between fingers that extend themselves in water but shrink to become inconspicuous when dry, water displacement and thus swimming becomes more effective. Recipients add +1 die to all

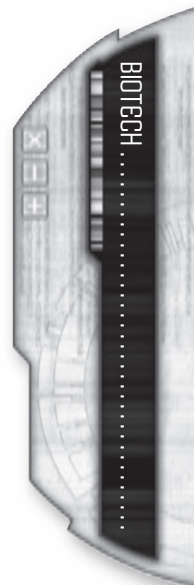
Swimming Tests, but receive a -1 dice pool modifier to any attempt at fine manipulation using the hands while they are wet and the webbing is extended.

Hearing Enhancement: By replacing the eardrum with a higher-performance organic membrane and increasing the nerve density and bandwidth, the range of frequencies that the recipient can hear is increased to include both very low (infrasonic) and very high (ultrasonic) frequencies. Overall hearing sensitivity is slightly enhanced as well.

The user can hear frequencies beyond the normal hearing range of humans and can even detect the use of ultrasound equipment in his vicinity. Combined with the vocal range enhancement or voice modulator cyberware, he can communicate with other characters at frequencies too high or too low for normal people to hear, and if he adds echolocation, he will possess a complete biological ultrasound system. Additionally, the character may add 1 die to any hearing-based Perception Tests.

Unlike cyberware audio enhancement, hearing enhancement is “always on.” This means the character may sometimes be distracted or deafened by noises inaudible to other metahumans.

Bioware	Essence	Availability	Cost
Gills	0.2	6	12,000¥
Hand and Foot Webbing	0.1	6	6,000¥
Hearing Enhancement	0.1	6	5,000¥



Metabolic Arrester: Similar to the suprathyroid gland (see p. 339, *SR4*), the metabolic arrester is a regulating gland grown on top of the thyroid gland. Under conditions where the body seems to be suffering from massive trauma, as measured by a severe drop in blood pressure and the presence of high levels of endorphins, the metabolic arrester supersedes the thyroid's metabolic functions, drastically decreasing the body's metabolic rate. As the heart and breathing rates slow to minimal levels and the body's temperature drops, the character takes on a death-like pallor. The lowered body functions help stave off the effects of trauma and reduce bleeding.

When a character suffers more Physical damage than he has boxes in his Physical damage column, the metabolic arrester kicks in and places the body in near-metabolic stasis. The body's metabolic processes are slowed by a factor of five, similar to a Hibernate spell with 5 successes (see p. 200, *SR4*). If the character is not stabilized, he suffers an additional box of overflow damage every (Body x 5) Combat Turns instead of every (Body) Combat Turns as normal. When the metabolic arrester is active, it takes a First Aid or Medicine (2) Test to determine that the character is still alive. The metabolic arrester is not compatible with the suprathyroid gland (p. 339, *SR4*) or adrenaline pump (p. 338, *SR4*).

Nephritic Screen: With the installation of a nephritic screen, the kidney is partially replaced and rebuilt to improve filtration and reclamation. Finer discrimination in the removal of waste products and harmful agents and the reclamation of useful materials causes a greater level of well-being. A side effect of this augmentation is that it becomes very difficult to get drunk or high on chemical substances.

Characters possessing a nephritic screen add the rating of the screen to their dice pool for tests to resist toxins and diseases with a speed of 1 minute or more, as well as to Addiction Tests for chemical drugs. The screen also reduces the duration of effect of any toxin or drug by 20 percent per rating point. The character's tolerance level for any chemical drug is also increased by the nephritic screen's rating.

Nictitating Membranes: This process stimulates the growth of a clear protective membrane covering the eyes, similar to that

possessed by many animals. This "inner eyelid" protects the eyes, keeping out sand, grit, smoke, and other irritants. This eye protection eases underwater activities. The membranes are light sensitive and become tinted under bright light. Further, they are polarized to reduce glare. Permanently tinted versions are available in any color the recipient may desire.

Nictitating membranes reduce the effects of smoke and other eye irritants, such as CS/tear gas; a character with this modification may add 2 dice to his dice pool for resisting this type of agents. They also act as a flare compensation enhancement (p. 323, *SR4*) for defending against flashes and glare.

Nictitating membranes are compatible with cybereyes and flare compensation retinal modification, but the additional compensation does not grant any benefits. The membranes also prevent the recipient from wearing contact lenses.

Quills: A quick transplant procedure and a hormonal and retroviral cocktail are all that is needed to replace select hair follicles with tough, needle-like spines similar to a hedgehog's. Each transplant procedure covers the surface area of a limb (i.e., an arm, a leg, or the torso). Individual quills are hollow and have a length of 2–4 centimeters. The quills can be wielded in melee combat using the Unarmed Combat skill if implanted on the arms (Exotic Melee Weapon: Quills skill if implanted elsewhere).

Spidersilk Gland: This is a special version of the chemical gland (p. 68) that produces spider silk protein. It adds spinnerets to the standard gland, through which the silk is extruded and dried to obtain its remarkable properties. The fiber is less than a centimeter thick, stronger than ballistic cloth, and about as sticky as packing tape—which means it doesn't stick too well unless applied in large quantities or wound tightly. The gland is typically implanted right beneath the wrist, or in some cases on the lower abdomen or back. It can be extruded from the gland at a rate that is fast enough to allow rappelling, and squirted out a short range (1 meter) to entangle small objects.

A wrist-implanted spider silk gland only contains two doses of spider silk; one implanted on the lower abdomen or back can contain up to 5 doses. Each dose produces up to 20 meters of fiber. The fiber is flammable, transparent, and difficult to see with any

Bioware	Essence	Availability	Cost
Metabolic Arrester	0.3	8	10,000¥
Nephritic Screen (Rating 1–4)	Rating x 0.1	8	Rating x 10,000¥
Nictitating Membrane	0.1	4	2,000¥
Quills	0.25	6	2,500¥
Spidersilk Gland	0.3	10	40,000¥
Tactile Sensitivity	0.2	8	4,000¥
Tailored Critter Pheromones (Rating 1–3)	Rating x 0.2	(Rating x 4)	Rating x 15,000¥
Troll's Eyes	0.1	6	8,000¥
Vocal Range Enhancer	0.1	8	12,000¥

Melee Attack	Reach	Damage	AP
Quills	—	(STR ÷ 2 + 1)P	+1



kind of vision. Once a dose is expended, the fiber will stick to the spinnerets until removed. Spider silk decomposes naturally in about a week, but an aerosol-dispensed enzyme can dissolve the silk in less than a minute (25 nuyen a dose).

Tactile Sensitivity: The user's sense of touch is greatly enhanced by tripling the sensory nerve endings in the fingers. Such increased sensitivity is in high demand in fields like microtronics and surgery. The treatment allows the character to detect otherwise imperceptible markings, prints, and tracks on most surfaces. Add a +2 dice pool modifier to all touch-based Perception Tests.

Tailored Critter Pheromones: This tailored pheromone variant is designed to affect animals of a specific species instead of metahumans. The effect, however, is much less subtle on animals, who rely on their scent for communication more strongly. The tailored critter pheromones add twice their rating to any test involving the handling of animals and affect paracritters and normal animals alike. The recipient must pick a single target species when this augmentation is added. The pheromones will only affect critters and animals of the chosen type, though related species might be affected as well, perhaps to a lesser degree at the gamemaster's discretion. Other species might respond negatively or even with hostility to the "animal scent" for biological (e.g., territorial) reasons.

Troll's Eyes: Like the cat's eyes augmentation (see p. 338, *SR4*), these enhancements replace the recipient's eyes with vat-grown eyeballs that extend the spectrum of wavelengths he can perceive. A portion of the color-sensitive rods are altered so that they are sensitive to infrared light. This bioware provides natural thermographic vision. The recipient, however, loses all metatype vision benefits. Due to the difficulty of the treatment, it is not possible to get "combo" eyes that combine several of the bio-vision enhancements. This implant is incompatible with cybereyes or cat's eyes.

Vocal Range Enhancer: A favored augmentation among pop stars, opera singers and faces alike, this modification greatly enhances the vocal range of the recipient. The recipient can modulate her voice below and above the normal metahuman hearing range, up to the point of emitting ultrasound. Likewise, there are no tonal restrictions, resulting in a full-scale singing voice and the ability to perfectly mimic other voices or sounds.

A vocal range enhancer can act like an ultrasound emitter, and along with hearing enhancement and echolocation can be used as a biological ultrasound system. If the character is observed while emitting ultrasound, the observer will be able to tell that the character is making a noise with his mouth but won't be able to hear it. A character with this augmentation and hearing enhancement can communicate with other characters possessing the same enhancements at low or high frequencies that are inaudible to normal humans.

At the gamemaster's discretion, a vocal range enhancer user also gains +1 die for any Social Skill Tests that involve speaking (and +2 dice for all tests involving singing) when her voice is audible. The character may also imitate noises or voices; when doing so to fool a voice recognition system, the character makes an Opposed Test between her Charisma + Con against twice the biometric system's rating (see p. 256, *SR4*), or in the case of a metahuman listener, against his Perception + Intuition. The gamemaster should feel free to impose modifiers on this roll based on how familiar both the recipient and her opponent are with the voice or sound that is imitated.



Chemical Gland

A chemical gland is a sac lined with cells that are genetically tailored to produce a single, naturally occurring substance. Examples of these naturally occurring compounds include snake venoms; toxins from insects, spiders, frogs, or fish; ink, such as that from octopuses; irritants, like skunk fluid; royal jelly; insulin; slime, as exuded by snails; acids, such as those used in digestion; pigments and fluorescing compounds, such as green fluorescing protein; some recreational chemicals, like alcohol and some hallucinogens; and simple compounds made of elements found naturally in the body, such as cyanide and nitrous oxide. The gland can also produce or concentrate elementary substances occurring in the body, such as hydrogen and chlorine, but not arsenic or other heavy metals.

A chemical gland costs 30,000 nuyen, plus 100 times the cost of one dose of the compound. The availability is 12 or the availability of the compound, whichever is higher. If the compound is restricted or forbidden, then so is the chemical gland that produces it.

Each gland can manufacture only one type of compound, which must be chosen before implantation. The gamemaster has the final say on which compounds are available. The gland requires 24 hours to manufacture one dose and can contain a maximum of four doses. The sac is treated to withstand whichever compound it contains. The compound is stored in the sac until used, and it can be deployed in one of the four manners described below. A character may have multiple chemical glands implanted but may only use one exhalation spray and one spitter for deployment. Implantation of the gland provides no protection for the user; safety measures, such as a toxin extractor, a nephritic screen, or an auto-injector with an antidote are highly recommended.

Exhalation Spray: Implanted in the neck above the larynx, this gland is equipped with sphincters. When triggered via a learned reflex—such as a massive diaphragm contraction causing a deep inhalation, followed by a strong exhaling action—the sphincters open and the compound is exhaled, much like an aerosol. In game terms, the character exhales the compound in a cone that extends out to one-half his unaugmented Body attribute in meters, and the compound can catch up to two targets that are within one

meter of each other. Use the Speed, Power, Effect, and vector of the compound (only compounds with contact or inhalation vectors can be used in this manner). The character can exhale up to the amount of doses stored in the gland. He may expose himself to the exhaled compound while using this ability by exhaling against the wind, cupping his hands over his mouth, or breathing against a solid barrier of some sort.

Internal Release: The gland can be designed to release measured doses into the user's bloodstream or digestive system, either at regular intervals (constantly keeping the equivalent of one dose in the character's body) or via a learned reflex, thus serving as a biological auto-injector. The first release method can be placed anywhere in the body; the latter requires placement near muscles that the user can consciously control to trigger release.

Spit: Also implanted in the upper neck, the gland collects mucus in a reservoir sack. If the compound is not a liquid, it is dissolved in a mucus to be applied with this method. When squeezed, the sac ejects the compound, spitting it out the mouth. To strike an intended target, the character rolls a ranged attack using the Exotic Ranged Weapon: Spit skill + Agility, with a range of (Body) meters. Use the normal Speed, Power, and Effect of the compound to determine effect. Only a single dose may be spat per use.

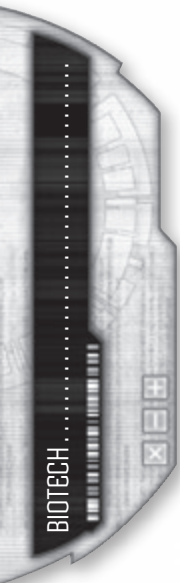
Weapon Reservoir: Implanted next to a cyber-implant weapon, the gland secretes the compound into a reservoir that coats the weapon automatically before deployment. The compound is dissolved in a natural mucus for this purpose to insure that the coating has the proper viscosity. In game terms, the gland coats a bladed cyberweapon with a sufficient amount of compound so that the next successful attack with that weapon applies one dose of the compound to the victim. The weapon has to be retracted again to refresh the coating. Cyber dartguns and cybersquirts can also draw from this reservoir, though the amount of compound is limited to one shot per dose.

False Front

False front is probably one of the most radical bioaugmentations available—and also one of the most illegal. It allows the character to profoundly change his appearance within minutes. Artificial muscle groups are implanted in the various parts of the body that the recipient wants to alter. Upon injection of a signal

Bioware	Essence	Availability	Cost
Chemical Gland	0.3	12*	30,000¥ + (compound dose cost x 100¥)
Exhalation Spray	0.1	—	5,000¥
Internal Release	—	—	1,000¥
Spit	0.1	—	3,000¥
Weapon Reservoir	0.1	—	2,000¥
False Front (Rating 1–4)	Rating x 0.2	(Rating x 4)R	Rating x 12,000¥
Mimic Option	—	+4	+10,000¥
Signal Drug (per dose)	—	8	50¥
Mimic Signal Drug (per dose)	—	12	500¥

* See description



drug, the muscle groups contract, radically changing the shape of the face or body. Add the false front's rating as a dice pool modifier to any Disguise Tests to hide his original appearance. Apparent body mass cannot be changed by more than 20 percent. The appearance change occurs within one minute and lasts for 30 minutes per dose of the signal drug injected. The drug can be synthesized and injected by a chemical gland (p. 68), if desired.

The standard version of the false front does not grant the user much control over the final appearance, and in fact the look of the false front will alter visibly with each use, according to slight variations in the signal drug's composition, its reception by the implanted muscle groups, and the user's metabolism. The intent is to simply present a new look each time, rather than mimic a specific appearance.

False front works well with chameleon skin (p. 62). The signal drug can be used to trigger a specific change in skin hue, adding an additional +1 dice pool modifier to Disguise Tests.

Mimic Option: A false front augmentation with the mimic option is designed not just to disguise the character's original appearance, but to attempt to copy a specific someone's appearance. The signal drug is more complex with this version, offering a finer control over specific muscle groups, so the look can be more specifically tailored. The disguise must first be programmed or scanned in the same method as a latex face mask (p. 330, *SR4*), with the maximum disguise rating limited by the false front's rating. The signal drug's exact composition must then be programmed to fit the disguise, using a medkit. The disguise rating adds to the character's dice pool for impersonation Disguise Tests.

Orthoskin Upgrades

The following skin modifications can be added to orthoskin augmentation. They can be added when the orthoskin is first implanted, or at any later time. All modifications are compatible with each other.

Dragon Hide: Dragon hide consists of a flame-retardant polymer grafted to the skin. Heat-conducting fibres prevent localized heating and distribute the heat across the entire body, preventing blistering and burning, and ablative foam materials evaporate to dissipate energy. The recipient receives +2 dice to resist Fire damage. The recipient also suffers a -2 dice pool penalty to Perception Tests involving heat.

Electroshock: For this augmentation, stacks of electroplaques similar to those found in electric eels are implanted under the skin, allowing the user to deliver powerful jolts of electricity from any part of his exposed skin. Instead of doing regular damage in unarmed combat, the recipient may choose to inflict damage as if wielding a stun baton (p. 305, *SR4*). The damage may also be inflicted on opponents that are grappling with the recipient or on anybody the recipient is touching in non-combat situations. The recipient is im-

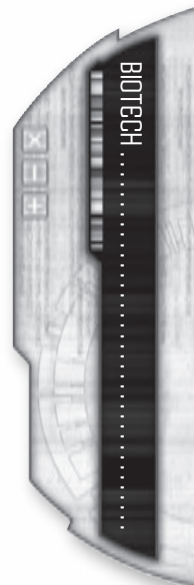


mune to damage inflicted in this fashion, but this modification does not provide any protection from other sources of electricity.

Sharkskin: The recipient's skin is densely covered with denticles, small cartilage outgrowths that make the skin as rough as sandpaper and provide it with superior hydrodynamic properties. When not wearing clothing or armor, the recipient's Swimming Rate is improved by 1 meter/Combat Turn. Further, the subject's skin is now so rough that he will inflict scraping wounds on any character when he brushes by them rapidly or handles them roughly. These wounds will typically be too small to inflict any damage, but may cause a -1 dice pool distraction at the gamemaster's discretion. This penalty is not cumulative with other damage penalties. Sharkskin is not compatible with Silky Skin.

Smart Insulation: Making use of the body's own heat regulation mechanism that causes sweating, this enhancement uses the same feedback proteins to alter the size and density of air pockets in the deepest layer of the orthoskin to enhance or reduce the thermal insulation that the skin provides. The recipient is comfortable throughout a wide range of temperatures. She also counts as having climate control for the purpose of Survival Tests and reduces the penalty for weather conditions and inappropriate clothing by 2.

Bioware	Essence	Availability	Cost
Orthoskin Upgrades			
Dragon's Hide	0.1	4	7,000¥
Electroshock	0.25	4	25,000¥
Sharkskin	0.1	4	5,000¥
Smart Insulation	0.1	4	12,000¥



Cultured Bioware

Reception Enhancer: Metahuman brains are only capable of handling a limited amount of sensory data at any given time (particularly in an age of AR and wi-fi information bombardment). The reception enhancer modifies the parts of the brain that pick up and process sensory information by grafting specialized neural tissue and reinforcing neuron connections to those parts of the brain. This enables the user to glean as much as possible from incoming sensory data. The reception enhancer provides a bonus equal to its rating on all Perception Tests. This bonus is cumulative with those from sensors.

Thermosense Organs: Derived from the heat-sensing organs found in pit vipers, the genengineered thermosense organs are grafted onto the sides of the head or neck. A cluster of specialized nervous tissue is also added to the sensory cortex, allowing the recipient to interpret the organ's sensory input.

Thermosense organs allow the character to make a (non-visual) Perception + Intuition Test to detect anything that produces heat (bodies, electronics, etc.) within a maximum range of 10 meters. Increase the threshold for factors such as warm environments, lower heat-outputs (such as from friction or decomposition), or heat pollution (too many objects or thermal smoke). The number of hits determines how much information the character gains about the target's proximity, movement, and heat-output. This sense works against both Invisibility and Silence spells. An attack made using thermosense alone suffers a -6 blind fire modifier.

Trauma Damper: A trauma damper is a clump of specialized receptors, implanted at the base of the thalamus, near the midbrain. Upon receiving sensory information indicating fatigue, pain, or physical trauma, the damper triggers the release of concentrated endorphins and enkephalins—naturally produced opiates and painkillers. These substances do not aid in repairing the trauma, but they may keep the user alive and conscious long enough for him to receive medical help.

Whenever Physical or Stun damage is inflicted upon a character with a trauma damper, the damper helps reduce the damage. If the damage is Physical, shift 1 box from Physical to Stun; if the trauma stems from Stun damage, subtract 1 box. For example, a character who suffers a Physical wound with a DV 6 marks off 5 boxes of Physical Damage Track and 1 box on Stun Damage Track; if it had been Stun damage with DV 6, the character would only mark off 5 boxes on his Stun Damage Track.

A trauma damper negates any dice pool modifiers an intimidator may gain from inflicting pain on the subject. Given the feedback-driven nature of the trauma damper, it cannot function properly when used in conjunction with an activated pain editor. In characters implanted with damage compensators, the trauma damper will only operate properly after the compensators' ability to handle Physical and/or Stun damage has been exceeded. When combined with a platelet factory, the trauma damper is applied

first, then the platelet factory effect is applied (i.e., the platelet factory is only beneficial if 3 or more boxes of damage are suffered).

SYMBIONTS

Unlike normal bioware, symbionts are entirely independent, vat-grown, gene-tailored organisms implanted in or on the host body with whom they form a symbiotic relationship. They are definitely not for the squeamish; not everyone deals well with having a slug-like or tentacled *thing* crawling under or over their skin, wrapping around organs, or sloshing about in their stomachs. Nonetheless, symbionts represent the cutting edge of low-Essence, minimally-disruptive augmentation, though they are still both costly and hard to acquire.

Like other bioware, a symbiont must be gene-tailored and protein-matched to each particular recipient so that it does not trigger an immune response (which usually leads to the destruction of the symbiont rather than any harm to the recipient). Also, the symbiont's reproductive levels and nutrient consumption are usually tailored to the recipient to reduce acclimatization stress and make the symbiont little to no burden to the host. The symbiont typically taps into the subject's circulatory and digestive system for nutrients and sustenance, entailing an increased lifestyle cost to reflect the extra food the host must consume to support it. Symbionts can be detected by astral perception, requiring 4 hits on the Assessing Test.

Symbionts are not available in different grades, but are considered cultured bioware.

Dangers of Symbionts

Symbionts are a very new development, and while many varieties are already available to the public, much is still unknown about their potential risks and long-term ramifications. What is known is that they are not without their dangers. Following particularly traumatic or stressful physiological events—exemplified by a critical glitch on any test modified by the symbiont (though the gamemaster should conceal the effect behind some appropriate alternative)—symbionts have been known to break with their “programming” and become parasitic. In such cases, the shift is gradual and not immediately apparent. Deceivingly, the symbiont continues to perform its function, while discreetly it begins to consume more and more of the host body's resources. It may take some time before the host realizes the nature of the problem. Meanwhile he will begin to feel weak and takes one box of Physical damage every week that cannot be healed until the symbiont is surgically removed. Since the symbiont will actively fight removal, this requires a Medicine + Logic (12, 1 hour) Extended Test.

Leech Symbionts

Though Genesis is leading the field of ectosont technology, UniOmni/Renraku were the first to introduce ectosymbiont leech symbionts. Leech symbionts usually feature one or more neural

Bioware	Essence	Availability	Cost
Reception Enhancer (Rating 1–3)	Rating x 0.2	Rating x 3	Rating x 20,000¥
Thermosense Organs	0.3	10	15,000¥
Trauma Damper	0.2	8R	40,000¥



shunts that create a link between the nervous systems of the host and symbiont.

Carapace: Carapace symbionts possess a natural hardened shell and are implanted subdermally in critical areas (covering the chest and upper limbs), acting as a form of dermal armor that provide +1 point of natural armor that is cumulative with other types of armor (similar to the troll's natural armor). Careful clothing can conceal the leech symbionts from view. This symbiont is incompatible with any other skin modifications.

Glow: This mana-sensitive leech possesses spliced glowmoss genes. Whenever an astral form passes through the host body, the symbiont trembles and visibly glows. Glow symbionts have also been known to light up when passing through particularly-powerful mana barriers (Force 4+), in the area effect of powerful spells (Force 4+), or in mana warp areas. Allow the host to make a Perception + Intuition (4) Test, with a +2 dice pool bonus from the symbiont. If the test succeeds, the character feels the symbiont vibrate and the leech glows.

Sac: This leech symbiont is essentially a living chemical gland (p. 68), designed to release its compound into the host's system either at regular intervals (constantly keeping the equivalent of one dose in the character's body) or with a neural signal.

Endosymbionts

Dubbed "endosonts" by biotech companies, these symbionts are installed internally into their host's gastrointestinal tract or in spaces between organs. Once implanted, they embed themselves and form neural connections that allow them to fulfill their pre-defined function.

Booster Endosont: The booster symbiont provides stored energy and nutrition as soon as the body requires it. As a consequence, it takes a longer time before the host suffers from Fatigue damage (p.155, *SR4*). Double the duration of the base period following which the host takes damage.

Digester Endosont: This symbiont combats the inherent wastefulness of the metahuman digestive process. A significant percentage of the food and liquids the body consumes is not completely digested, by design. The symbiotic digester converts indigestible elements such as cellulose and certain proteins into forms readily digested by the organism, feeding itself in the proc-

ess. It also reduces the amount of water lost in the body's solid waste by 75 percent. Hosts may reduce their normal food intake by 50 percent and may double the time they can go without water to approximately 48 hours.

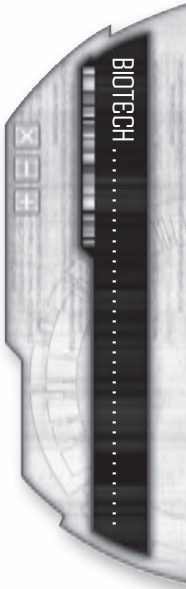
Electroreceptor Endosont: This symbiont is especially sensitive to electrical pulses and magnetic fields, passing along such sensations to the host's nervous system, who experiences them as a slight buzz. This allows the host to make a Perception + Intuition Test to detect magnetic fields and electrical emanations, like those from active electronics, MAD scanners, or power supplies, within a maximum range of 1 meter (the gamemaster determines the threshold). The host can also easily determine magnetic north.

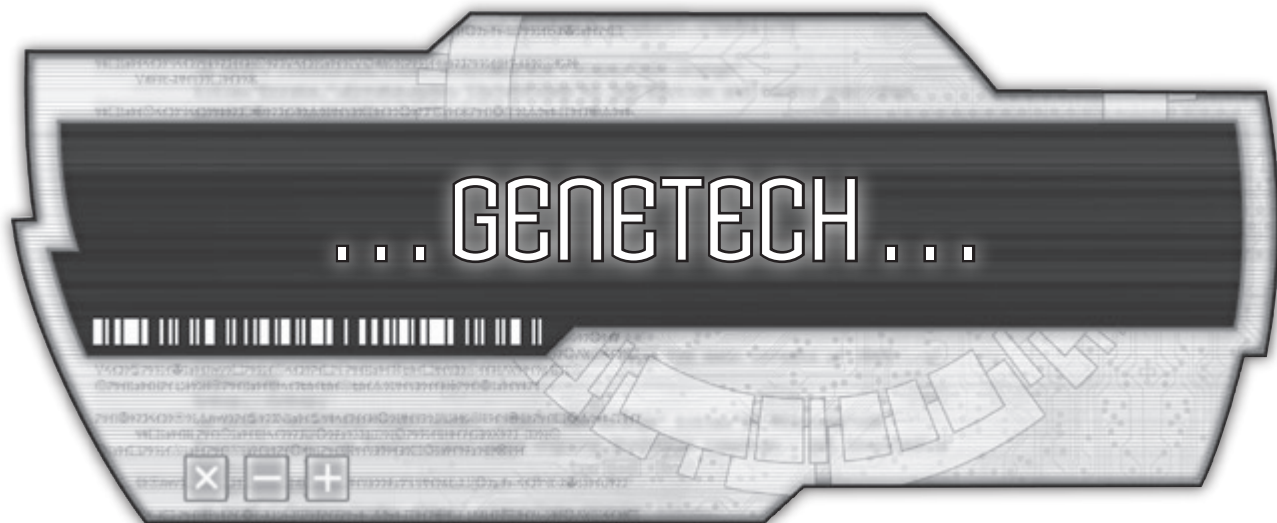
Mender Endosont: A mender endosymbiont functions as a kind of living medkit, its neural link to the user warning it of any significant trauma. When the host takes Physical damage, the mender moves internally to eat dead skin, promote healing, and secrete antibacterials and coagulants to stop bleeding and prevent infection. The mender adds +2 dice to the host's Physical damage Healing Tests.

Slimworm: Slimworms were created as a smart anti-obesity medical treatment to reduce and control weight by suppression of the appetite, increase of the body's metabolism or interference with the body's ability to absorb specific nutrients in food (e.g., blocking fat breakdown and thus preventing fat absorption) without stressing the host too much by overmedication. As long as the abilities of the symbiont are not overstrained or cancelled (by starvation), the host will preserve a certain weight and nutrition level (laid out by the symbiont's design) no matter how much or little he or she eats. However, if the recipient undereats, he has to go on eating binges at regular intervals to keep the slimworm from starving. Slimworms also provide a +1 modifier to Body Tests when resisting ingested toxins.

Stalwart Endosont: This symbiont secretes a specially-tailored neurotransmitter that subtly modifies the host's behaviour, making him slightly more resistant to fear. Apply a +1 dice pool modifier to any tests to resist fear or intimidation. Some hosts have also noticed a slight increase in risk-taking behaviour; at the gamemaster's discretion, the character must make a Willpower + Logic (3) Test to actively resist taking unnecessary risks or remaining in dangerous situations.

Symbiont	Essence	Availability	Cost
Leech Symbiont			
Carapace	0.2	16	30,000¥
Glow	0.2	16	40,000¥
Sac	0.2	24	30,000¥ + (compound dose cost x 100¥)
Endosymbiont			
Booster	0.2	16	30,000¥
Electroreceptor	0.2	12	20,000¥
Mender	0.2	16	40,000¥
Digester	0.2	12	20,000¥
Slimworm	0.2	4	1,000¥
Stalwart	0.2	16	30,000¥





The first thing she saw was the pale blue gel. It was everywhere. It oozed from her body as they pulled her from the tank—dripping as if she had just been birthed from an alien womb. The realization made her smile, as it was not so far from the truth. The smile disintegrated a moment later as she began retching helplessly onto the floor.

During her immersion, that oxygenated gel had kept her alive. Once out of the tank and conscious again, her body rejected it, forcing it from her lungs and stomach in wracking spasms. Thick blue liquid spilled across the clean white floor, even as people in white coats lifted her shivering body from the cold tiles. The attendants carried her to a warm examination table. As her body expelled the last of the gel, her convulsions slowly stilled. She felt suddenly exhausted, drawing slow ragged breaths. The drugs still in her system took over. She barely registered gloved hands briskly wiping her down before she passed out.

The light was the next thing she saw. She came to suddenly, her eyes refusing to focus. She blinked hard and faces came swimming into view.

"Ms. Yoshiko Hino?"

"How long have I been in there?" she mumbled. Her words were slurred as though she'd been on a two-day bender. She took a deep breath, trying to clear her head from the effects of the drugs.

"32 days." His face was still blurry to her, but that was definitely Kaminsky's voice, slick and disdainful no matter what the occasion. "I am glad to inform you that the procedure was a full success. Infection of the vector was about 99.6%. Genetherapeutic splicing and transformation took place as specified and approved. Physical post-infection stress was within parameters, and residuals of the virus after genomic reconstruction were completely eliminated by your own immune system. There were some minor complications during transformation due to unpredictable cross-reactions with silent genes, but those were corrected by gene-technicians here at the facility. No need to worry."

A nurse over by the side of her bed did something to her I.V. Her eyelids began to droop, and she had trouble concentrating on what he was saying.

"I congratulate you," Kaminsky said. "You have been genetically reborn." His artificial smile was the last thing she saw before the world slipped out of focus again.

A few days later, she was recovered enough to watch the condensed video record of her transformation process. It held a horrific fascination for her; she must have watched it twenty times already that day. As the genes that determined her physical traits had been realigned, she had passed through some monstrous intermediate stages. She watched as her skull grew and shrank on the screen, shuddering involuntarily at the sight. She was glad that she hadn't been conscious.

Out of the corner of her eye, she saw a stranger in her room. She glanced up and stared yet again; she still could scarcely accept that the woman she saw was her own reflection in the mirror. One month ago she had been a small black-haired Japanese woman with amygdaline eyes and Asian features. Now she was a Caucasian redhead, nearly 6 inches taller with a voluptuous body. Even her voice had changed, now a husky contralto. The genetic IDs they ran showed no match with anyone else, living or deceased. Vocal training that would remove any residual Japanese accent.

No one would find her now.



GENETICS 101

Posted By: The Smiling Bandit

When the first farmer chose which seeds to sow and which animals to breed, mankind began its study of heredity. In 1866, Gregor Mendel published his statistical analysis of heredity in pea plants and inadvertently launched the science of genetics. Nearly a century later, in 1953, James Watson and Francis Crick deciphered the structure of DNA, and identified it as the blueprint for life. Since then, genetics has gone from a method of observing and predicting life to one of manipulating it. We've gotten very good at it.

Welcome to a brave new world. Not happy with how you look, but don't fancy cosmetic surgery or cybernetics? Have your genes restructured and be what you think Mother Nature should have made you in the first place. Want to have a child that is, in a word, perfect? Why go to the bother of living healthy and looking for a good mate? Instead, you can go to the lab and have your fetus's genetic makeup altered. Hereditary and genetic diseases? Have them written out of your genome. Genetech is your (expensive) ticket to a perfect life—or at least that's the hype. Don't get me wrong, most of the treatments on the market are perfectly safe and reliable. My problem is how the tweaked genomes and transgenic material that are being spliced into our genome are going to interact, catalyze and drift down the line. Nature's had a hundred million years to tinker, we're just kids let loose in the workshop.

- Of course, there are exceptions, therapies and treatments rushed onto the market before being fully tested. Big lawsuits were leveled at Evo's Pensodyne and Aztech's Genetique after otherwise innocuous transgenic therapies were discovered to activate retroviruses—in one case causing diabetes, in another a serious lymphatic disorder. I don't share Bandit's fears regarding the long-term ramifications though.
- KAM
- That hardly surprises me.
- The Smiling Bandit
- Tan Tien and Universal Omnitech have a nasty habit of field testing their new genetweaks in undeveloped backwaters like inland China and Africa. The success rates out there are a bit lower.
- Nephrine

Genetech allows people to be faster, smarter, and stronger. It also ties into cloning advancements—with appropriate DNA samples, it's easier to clone replacement organs and limbs for individuals than to transplant them. No need to rely on a donor when the technology is there to custom-make a replacement part built from you, for you and you alone.

Genetech isn't cheap. It can wipe out diseases before you even know you have them, but it's so expensive that for the average citizen, it might as well not exist. The corporations have it somewhat better, especially the ones conducting extensive genetech research. The days where everyone has a backup clone ready to go, however, are far, far away.

UNIVERSAL OMNITECH PORTAL

Genetech Glossary

Base is the common name used for nucleobase. These are the basic components of RNA and DNA polymer chains. They include cytosine (C), guanine (G), adenine (A), thymine (T, DNA), and uracil (U, RNA).

Base pair (bp) is a partnership of A with T or of C with G in a DNA double helix.

Chimera are transgenic creations sharing physical traits from different organisms or new designs; valued as designer pets.

Chromosome is a discrete molecule of DNA and associated proteins encoding many genes. Complex organisms have numerous chromosomes within their genome.

DNA is the abbreviation for deoxyribonucleic acid, a double-stranded polymer of bases held together by a backbone of sugar and phosphate groups. It is characterized by a double helix, created by two complementary strands joined by base pairs.

DNA Fingerprint is a pattern of polymorphisms used to identify individuals. A DNA fingerprint can also reveal ethnicity, disease risk, and genetic modifications.

Gene is the segment of DNA involved in producing an RNA transcript. It includes the transcribed or translated regions and surrounding regions of pseudogenes or "junk" DNA that may affect how the transcript is expressed.

Gene therapy is the transfer of genetic information into cells and tissues to achieve a desired effect.

Genome refers to all the DNA within an organism.

Genotype identifies the specific polymorphism present in an organism's genome.

Metagene is an Awakened gene whose product is involved in metatraits; also a collective term for all genes responsible for the expression of metatraits or magical abilities.

Metatrait is a physical characteristic whose development is due to the expression of one or more metagenes. Most are race specific. Examples include pointed ears, unusual stature, heat-sensitive sight, and calciferous dermal deposits.

Mutation describes any change in the sequence of genomic DNA.

Organism refers to anything that's living. This includes animals, plants, fungus, and bacteria.

Phenotype refers to any physiologic characteristic of an organism resulting from its genetic constitution.

Polymorphism is a region of the genome that is known to lead to variation in individuals in a population.

Pseudogenes are usually inactive but stable components of the genome derived by duplication and mutation of an ancestral gene; colloquially known as "junk" DNA.

Continued on page 75



UNIVERSAL OMNITECH PORTAL

Genetech Glossary

Retrovirus is an RNA virus that propagates via conversion into duplex DNA and insertion into a host genome.

RNA is a single-stranded nucleic acid polymer consisting of nucleotide monomers similar to DNA. It is transcribed (synthesized) from DNA and serves many metabolic roles, including the template for translation of genes into proteins.

Sequence refers to the order of individual base pairs within a DNA strand.

Transcription is the synthesis of RNA from a DNA template.

Transgenic refers to organisms created by introducing foreign DNA sequences into all cells via gene therapy.

Translation is the synthesis of protein from an RNA template.

Virus is a microscopic particle that can infect the cells of a biological organism. Viruses reproduce only by infecting a host cell.

FROM BASES TO BASICS

Everybody knows that nucleic acids work like software to drive synthesis of the rest of the body's hardware—proteins, lipids and sugars. DNA is often compared to a blueprint, since its sequence encodes the instructions to construct other components of a cell, such as proteins and RNA molecules. Change that sequence and you change the products. DNA sequences that carry genetic information are called genes. There's a lot of DNA that has other functions though. Some regulate how much of a protein is expressed—that's how your body knows to turn some cells into muscle and other cells into nerves. Other DNA sequences have structural roles to make cell division possible, allowing you to grow and heal. Some of it we're still not sure about. Anything that's not part of something we recognize as a gene is colloquially referred to as "junk DNA."

Proteins handle most of the grunt work within the cell. Essentially, they do the work that the genes encode. Except for ribozymes, most biological molecules are fairly inert while proteins do the heavy lifting. In order to produce a protein, the code of the genes has to be read out and processed. Two major steps mark this gene expression process—*transcription* and *translation*.

Transcription produces a single-stranded RNA molecule. It's more or less a photocopy of one side of the DNA gene. Typically, RNA is an intermediate step in the process of manufacturing proteins from genes. Sometimes this RNA molecule is the end product. These RNA strands, called ribozymes, play a part in keeping the cell running like it's supposed to. Translation uses that RNA strand as a template. This is where the cell's manufacturing systems get busy and turn the code in the RNA sequence into a protein.

In practice, this gets pretty complicated. That's why we've got expert systems and overpaid geneticists.

• Viruses use this basic mechanism to their advantage. DNA viruses or RNA retroviruses employ their host's transcription and translation machineries to synthesize their own proteins. Some viruses even manage to sneak their own code back into their host's DNA sequence. Those are what form the basis of genetic engineering.

• Nephrine

THE METAHUMAN GENOME

An organism's DNA sequence is known as its genome. A complete copy of this code resides in just about every cell an organism has. More complex organisms typically have more genes, but that doesn't mean they always have more DNA—there can be an awful lot of that "junk DNA." Metahumans have about 3 billion base pairs in their sequence, encoding about 25,000 genes (plus or minus 5,000).

Most of the metahuman sequence is pretty much identical from person to person. A little less than 1 percent of it is variable. Those variations, called polymorphisms, are what make people different at a biological level. Identifying those polymorphisms is called genotyping. The physical changes that match up with those different genotypes are called phenotypes. When a physician or forensic scientist takes a blood sample, they can use it to find your ethnic history, your risk for disease, and—if you have a SIN—your criminal record.

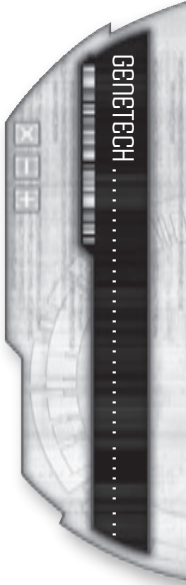
Genomics is the art of using a whole lot of computing power to study the genetic patterns across the entire DNA sequence in a genome. Before 2011, scientists thought they were getting a handle on regulatory systems and genome structure. It wasn't all there yet, but conventional wisdom said it wasn't all that far off.

Metagenes

The Awakening and the rise of metahumanity in 2011 complicated matters. Geneticists learned a hard lesson: they knew a lot less than they thought they did. Clearly, magic and the influence of astral space added a whole new level of complexity to their research.

When the first elves and dwarfs appeared, physicians were sure it had to be a genetic effect. The catch was that researchers couldn't find the polymorphisms to associate with the new phenotypes. They dubbed it UGE (Unexplained Genetic Expression) and decided that it was a new puzzle to solve. They correctly hypothesized that the emergence of magical phenomenon might have played a role. That's become the governing theory of metagenetic research ever since. The theory also explains so-called spike babies—the rare recorded instances of metahuman expression prior to the Awakening—rather nicely, since thaumaturgic theory suggests ambient mana does not follow a simple sine wave but rather has localized and irregular spikes associated with astronomical, geophysical, and arcane factors that are not fully understood. Such a mana spike in the Middle Ages could be the root of many European legends of trolls, goblins, and elves.

When Goblinization began in 2021, it was immediately linked to UGE. The nature of the activation differed, however; UGE only occurred prenatally, while Goblinization could happen prenatally or by transformation. Since the new races could still interbreed with humans, however, geneticists knew that there had to be some genetic basis for all of these new phenotypes, called metatraits.





Pinpointing the metagenes for these racial characteristics (pointy ears, horns, tusks, dermal bone deposits, and more) proved unsuccessful for decades. It was only in the 2040s that genetic and thaumaturgical knowledge progressed enough to begin identifying metagenes. The landmark Hausen Project (2046-47) led to the identification of the first “astral shadows” associated with DNA. Current theory proposes that metagenes are sequences that are responsive to the ambient mana flow from astral space; at given mana levels, certain dormant genetic sequences are triggered. Exactly how this happens remains a mystery.

Genetic Astral Shadows

As all living objects have auras, DNA has a shadow in astral space. Current theory proposes that metagenes are responsive to the magical background levels. Once the mana levels started to rise, the conformation of genetic elements changed. This caused DNA sequences to associate in ways that they never would have before the Awakening. These “composite” genes synthesize the proteins that are responsible for the development of metatraits. There are a lot of different theories about the cellular mechanics of this change; to date, the actual mechanism remains unknown. What is clear, however, is that the metagenes are only part of it. Geneticists theorize that there are unidentified sequences within non-coding regions of the genome, which they’ve dubbed Astral Responsive Elements (or AREs).

- This is why it’s so hard to research metatraits. *In vitro* techniques don’t work with metagenes; somehow the DNA knows it’s not in a complete organism. That’s why you cannot grow a metahuman-specific organ (even elven ears) in a petri dish. Sometimes even full-scale clones don’t develop into metahumans, with money being wasted all along the way.
- KAM

Metatraits & Heredity

The Hausen breakthroughs yielded the Nobel Prize for Medicine in 2050. What really won them the award was their explanation of the differences between UGE and Goblinization. Elven and dwarf metagenes can only establish expression during embryonic development. Thus, a human will not express the *nobilis* and *pumilionis* traits after differentiation has occurred. Ork and troll metagenes can express either *in vitro*, through sudden expression triggered by puberty, or via a radical increase in ambient mana.

Forty-one metatraits have been identified as of this writing, but this may just be the tip of the iceberg. While metagenes are clearly inherited and generally metatypes breed true, in a few rare combinations they do not. It has been hypothesized that a complex interaction between a substantial number of these metagenes is key to reaching some sort of threshold. Instances of metahuman parents having human or different metavariant children have been recorded. Some combinations haven’t been observed, so it seems unlikely that two elven parents could ever have a troll. There are, however, many recorded instances of human children born of ork parents—though admittedly many go on to express at puberty, proving they have inherited all of the relevant metatraits.

It’s worth mentioning that only one combination or set of metatraits will ever express in a given organism. Current theory

suggests that this is due to the relationship between the astral shadows and the metagenes they activate. This fact excludes the possibility of partial expressions of metatraits associated with different metatypes.

- As long as I can remember, there have been forums dealing with the topic of “immortality genes”—a unique set of metagenes that causes immense longevity or simply never dying. They’re often referenced with elves or even “immortal elves.” No one has reported them so far, but the rumor keeps floating around—even among academic circles.

- Elijah

- I guess this means that whole “elven soul” reincarnation theory is toast. Yay!

- Frosty

- Hmm?

- Arete

- You know, the idea that people express as one thing or another because they’re a reincarnated from a bad Tolkien pastiche somewhere. It’s the latest thing in self-help. Hell, that whole “Reclaiming the Elven Soul” sim that’s been plastered in every AR mall on the planet is but the latest incarnation of it.

- Frosty

- Funny how it’s so much more popular among wanna-be humans than actual metas. Far be it from me to complain about someone else’s scam, though.

- Am-mut

- You’re forgetting that reincarnation—expressed as the “Path of the Wheel”—is the dominant ideology held by the elven Danaan families of Tír na nÓg. Maybe you have to be a special redheaded Irish elf to live forever.

- Axis Mundi

- Did you ever notice how it’s always elven souls that need reclaiming? Everyone’s trying to find their inner elf, but no one so much as knocks on a dwarf soul’s door to deliver pizza.

- Ethernaut

- My soul can go out and get its own pizza, thank you very much.

- Lyran

As the human race knows different ethnicities, local metatype variations exist. Examples include the hobgoblin and oni ork variants in the Middle East and Japan, the menehune dwarf subspecies in Hawaii, and the Greek cyclops and Mediterranean minotaur troll variants. All of these have different metatraits that separate their phenotype from the more common metatype members.

SURGE

The third wave of genetic expression, tagged SURGE (Sudden Recessive Genetic Expression), began with the passing of Halley’s Comet in 2061. This one seems to have been a genetic hiccup initiated by the temporary rise in the world’s ambient mana level. The



advent of changelings provided a deeper insight into metagenetics. Essentially, changelings are believed to be metahumans that express a number of mutant metagenes. Under our “normal” magic background, their fractured metagenome would typically yield a human phenotype. However, the Year of the Comet showed us that a heightened ambient mana level could cause spontaneous expression similar to Goblinization. The resulting metatrait or phenotype is impossible to predict and has led to a menagerie of exotic looks.

Since its occurrence, SURGE has been classified by the traits that are expressed. Class One changelings are basically metahumans with only a partial phenotype. They express only a subset of the metagenes and display incomplete metatraits—this was previously thought to be impossible. Examples of Class One SURGE include pointed ears, tusks, horns, or the ability to perceive the astral world. Class Two SURGE is thought to be caused by the activation of pseudogenes. Pseudogenes are genes that, for various reasons, are present but not expressed in an organism. Sometimes they are actively silenced by epigenetic change.

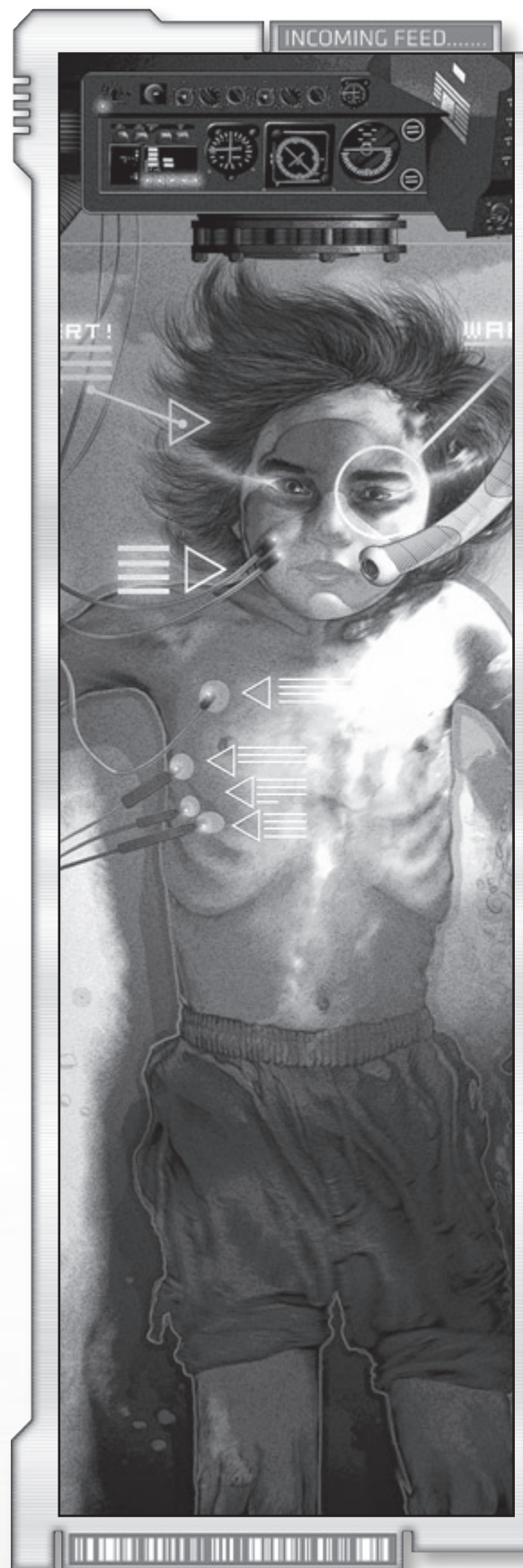
- Epigenetic changes are reversible inheritable changes in gene function that occur without change in DNA sequence/genotype. The details are too much to go into here, but it is a crucial mechanism in cellular differentiation.
- Nephrine

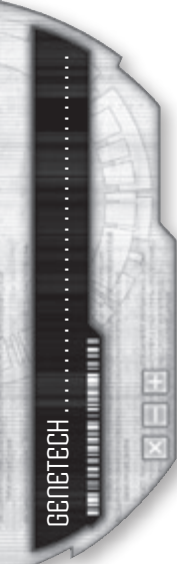
Some of these genes seem to be leftovers from ancestral forms. The mechanism by which these genes are activated is still elusive, however, their expression can cause animal-like features such as fur or tails, or even fully functional gills. The complication is that many Class Two traits are associated with animals that aren't believed to be part of mankind's evolution. The source of feline, canine, or even reptilian characteristics remains a mystery.

- Say what you like, real live catgirls are proof that the spirits love us and want us to be happy.
- Traveler Jones
- Oh look, I've just rolled my eyes so far back that I can see my brain.
- Mika

Class Three SURGE is categorized by the expression of severe deformations, sometime leading to the termination of the case. Theoretically, Class Three changes could encompass any metamorphosis, though experience has shown that a single physiological change (such as sprouting of multiple functional limbs) is more likely than a drastic transformation of multiple features.

Given their extreme appearances, changelings have been subject to substantial metahuman prejudice and persecution, being denounced as mutants, devil-spawn, and freaks. In the last decade, it has become evident that SURGE traits are often inherited. Aside from SURGE's dramatic initial appearance, it appears that changelings typically manifest prenatally as with UGE. Since 2062, there have been no reported new cases of SURGE, but it is theorized that some individuals might express if exposed to an elevated mana level.





The Magus Factor

Genealogical studies have shown that children of the Awakened are more likely to be Awakened themselves. Some theorists posit that this points to a genetic factor—the *magus factor*—that allows metahumans to channel magical energies. The subfield of magenetics has continued to be a hot research field despite decades of frustration and disappointment. Vast, corporate funding has kept the experimental research alive, but even that isn't limitless. What is known is that the molecular mechanics of the purported magus factor, if it indeed exists, are similar to metagenes. To date, however, magus factors have evaded nearly all mapping attempts.

- One theory is that these genes encode the ability to shift sensory reception to the otherwise imperceptible realm of the astral. It is unknown whether these are integral to the magus factor sequence, or whether linked genes allow the sensorial portions of the brain to translate information coming from assensing. Whatever it is, it's believed to be behind similar abilities in dual-natured critters.
- Ethernaut
- Almost a decade ago, rumors made the rounds on the West Coast suggesting Universal Omnitech or Telestrian had made progress in mapping at least one sequence related to the magus factor. The claims were never substantiated, but the corps exchanged some nasty shadow ops for a few months. Both corps have departments working on the matter, but it's unclear if there was any fire behind the smoke.
- Nephrine

Since magenetics are hard to study, corporate eggheads are always looking for innovative ways to pinpoint the tissues in the body where they are activated. Attempts have been made with positron emission tomography (PET) and alternative methods of scanning including X-ray computed tomography (CT), (functional) magnetic resonance imaging (fMRI), ultrasound, single photon emission computed tomography (SPECT), and astral radiance imaging (ARI)—a method combining mana-sensitive markers with astral photography. Several areas within the body, primarily various neural nexi and chakra points, display microscopic astral signatures that are thought to be tied to activation of the magus factor.

- Clones grown for medical reasons are never Awakened, even when samples are taken from an Awakened patient. However, when a transplant is connected to an Awakened host, the patient never encounters any limitations to their magical abilities. It's one of the holes in the m-factor theory.
- KAM
- Corps have tried nearly everything to observe an Awakening event in a child. The problem is that it requires having a mage assense a likely child 24/7 from birth through their teens—astral sensitive film is too slow and too expensive. Since nobody's yet sure if they're even watching the right kid, that's an awful lot of resources to invest. So far, they have only obtained before and after aura scans, though they're searching genetic and biochemical profiles to find a pattern in newly Awakened patients.
- Cosmo

Interestingly, recent studies reveal that another percentile of the population consists of latent or dormant magicians; people whose Talent has either been repressed, never Awakened, or done so incompletely and remains rudimentary. These individuals often show only a minor or specialized level of magical talent. The genetics underlying this latency are unknown but are assumed to be connected.

The Digital Knack

The recent emergence of technomancers has proven again that the world is still spinning and that it is full of surprises. The technomancer's bioelectrical field and cellular antenna (pun intended) appear to be a genetic phenomenon. A population study showed that a subset of technomancers have siblings with similar abilities. In both cases where a technomancer was known to have an identical twin, the twin was later proven to be a technomancer. The origin of eventual technomancer genes remains every bit of an enigma as the roots of magical talent.

Current hypotheses hold that technomantic ability did not evolve spontaneously, but is instead an expression of genetic traits dormant in metahumanity. Genetic disorders serve as a good analogy here: a minority of the population has the genetic predisposition to develop certain health problems—say a propensity for cancer—but they only do so if several other triggering factors come together.

- So my *condition* is a disease. I thought we were over that, thank you very much.
- Netcat
- Hey, don't shoot the messenger, this is what's making the rounds these days. Figuring out what makes technomancers what they are is essential if we're ever going to get along. Far too many people still think you were spawned by the Crash worm.
- The Smiling Bandit
- Can you blame people for being skeptical? Come on, you've heard the horror stories about the arcology and Deus's pet otaku. After all these months, can any of you honestly tell me Matrix Kitty here *isn't* a trojan with AI code riding in her head giving her powers?
- Clockwork

The key to this theory is identifying what triggers the expression of these genes. Theories on this topic have proved extremely controversial. Though technomancers have increased in numbers since Crash 2.0, many technomancers were not victimized by the crash. This rules out a direct involvement with the events that took place in the Matrix, though it seems too improbable to exclude an indirect effect. Of course, the new Matrix and ubiquitous wifi are also popular candidates. Honestly, I'm as confused as everyone else.

- Could be electric radiation hazard: in short, electro-smog. It was and is still suspected to affect biological systems (like causing cancer).
- Beaker



- That would make otaku the spike babies of the Matrix, and now we're seeing UGE. Wonder what the Matrix equivalent of Goblinization will bring?
- Plan 9

Magic and technomancer mojo seem to be mutually exclusive. This supports researchers who believe that there is no connection to metagenes that respond to the astral sphere. It is more likely neuronal response elements in DNA that react to electrical signals or neurochemistry have been altered due to an unknown trigger event.

- Since we've yet to encounter (as far we know) an Awakened technomancer, one current theory posits the two might be opposite expressions of the same X-gene. I foresee a long debate over this one.
- Nephrine
- Save me a seat. I'll bring the popcorn.
- The Smiling Bandit

XENOSAPIOENT GENOMES

The fact that metagenes and the magus factor are apparently not restricted to the *sapiens* species but extend to dozens of Awakened and sentient species on record is seen as hugely significant in scientific circles. Whether this speaks to an underlying genetic communality or is an expression of simple evolutionary drift is unknown. These organisms are dramatically easier to breed and study than metahumans, though, so corporate funding is minimal compared to investment in metahuman genetics research. That many Awakened species can procreate normally with their non-Awakened counterparts (even if many such beings find it distasteful) is also seen as significant to current evolutionary theory, as is the fact that most sapient species (including dragons, sasquatches, shapeshifters, and nagas) seem able to tap mana on a higher, non-instinctive level.

Of the major corps active in this field, only NeoNET, MCT (through its subsidiary, Parashield) and Green Globe have departments devoted to xenosapient genomics. Evo has numerous and diverse programs in place to explore and exploit xenosapient biology and genetics, while Ares and Saeder-Krupp are also rumored to have black programs running.

- The sapience of some of those races, including shapeshifters, naga, and merrow, is still a matter of heated contention. While some progressive countries grant them full citizenship, most grant restricted civil rights at best.
- Goat Foot
- So if the technomancer/magician theory pans out, does that mean that there might be critters who can innately log on to the Matrix?
- Baka Dabora
- Perhaps there already are.
- Netcat
- Don't say I didn't warn you.
- Clockwork
- It's so fucking easy to screw with your head, Clockwork.
- Netcat

MENDEL'S SUCCESSORS

A number of companies have ventured into the new frontiers of genetic enhancement, assembling a portfolio of forward-focused therapeutic genetics purportedly to enhance metahuman quality of life. Most of them, especially megacorp genetic subdivisions and subsidiaries, follow well-trodden commercial avenues to mine the potential inherent in these technologies. It is cutting-edge theoretical research, however, that keeps identifying new areas to exploit and develop. Compared to other augmentation industries like cybernetics, which is showing its age, genetic engineering has a long way to go to tap its full potential and remains one of the primary targets of inter-corporate espionage.

THE BIG PLAYERS

These are the most openly and significantly invested corps in this field. Though they aren't necessarily the largest out there, no one who keeps an eye on this field can possibly argue that these corps aren't the ones to watch.

Universal Omnitech

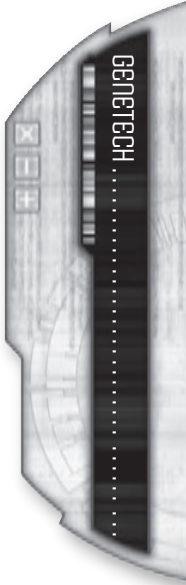
Universal Omnitech's (UO) greatest advantage is its diverse portfolio; the AA-corp chooses not to limit itself to any given branch or application of genetics. If there's nuyen to be made in anything gene-related, they're involved. Genengineering has been the focus of UO since its founding. It continues to lead the pack, constantly identifying trends and possibilities and effectively developing new markets. They are both acclaimed and feared for their achievements, which include Léonization, the first bio-synthetic pharmaceuticals, and (allegedly) hostile pathogens like Ebola Plus. Its continuing leading role in the industry has made UO a prime target for industrial espionage and R&D talent extractions—prompting it to deploy enhanced security personnel that put many a megacorp to shame.

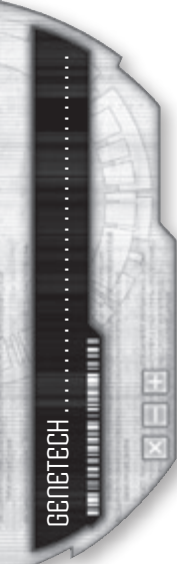
- Universal Omnitech is also rumored to own and operate the biggest gene databank in existence. It purportedly contains billions of DNA samples from different species and ethnicities, requiring hordes of agents to constantly sort, organize, and backup the dynamic data set.
- Fianchetto

Pensodyne (Evo)

Pensodyne is Evo's flagship when it comes to the technical realization of its declared transhumanist agenda. Pensodyne focuses on metahuman genomics and genetic applications and is renowned for cutting-edge geneware of all kinds, profiting from both Evo's enhancement expertise and marketing services. Pensodyne has pioneered several corrective treatments and novel protein expression augmentations cornering a significant portion of the consumer genetics market. Pensodyne is also the premiere researcher of metagenetics, surpassing even Universal Omnitech in this particular arena.

- Let's not overlook Evo's interests on Mars. I wonder if they ever did bring back those xenobiological genomes from the Red Planet.
- Plan 9
- Someone's off his meds again.
- Butch





Shiawase Biotech

Given their massive presence in the bio-market, Shiawase's solid foundation in genetic research and product development is unsurprising. The Japanacorp typically focuses most of its genetics R&D on biotech product development, but they have been expanding their presence lately with new transgenic creations in the agricultural and paranormal animal sector (including outsourced design for MCT's Parashield). Shiawase's treatments and products, while neither groundbreaking nor surprising, are decent enough to place it second behind Pensodyne in the demanding Asian markets.

Genetique (Aztechnology)

Cosmetic renewal, phenotypic alteration, and fertility and contraceptive treatments are what Genetique is known for, as well as transgenic art and everything worth mass marketing. Lesser known are its interests in agribusiness and its breakthroughs in GM crops and pharming. Though it lost some of its creative drive following the parting of ways between Aztechnology and Universal Omnitech, advertisements for their rejuvenation and genetic spa lines still spam the airwaves all over the world under different local brand names.

Proteus AG

Proteus is notable for its near dominance in environmental modifications and metahuman transgenics. In the last decade, though, they've employed their know-how to expand into a bewildering array of SOTA genengineering therapies and other money-making sidelines. Their adaptive genetweaking is some of the best in the business. They specialize in extreme environments such as space, underwater, subterranean, and hostile or heavily-polluted regions.

While they don't yet rival UO's or Pensodyne's expertise in metagenetics, they lead the field when it comes to the genetics and technical applications of biogenesis, reprogenetics, and early developmental genetic modification. Prodigy, their "designer baby" subsidiary, is struggling to keep up with demand in a burgeoning market.

MODERN MOREAUS

While most of the market leaders are huge double- or triple-A corporations, a few companies have managed to climb up the double-helix ladder by making the most of outstanding successes and exclusive breakthroughs, shaping or carving out a niche of their own in the still-diversifying gene-industry. Many of these corporations are working on truly revolutionary and next-gen applications of genengineering, waging an uphill struggle against bigger corps willing to play dirty.

Biogene (Yakashima)

Surprisingly (or not) for a subsidiary of the heavily racist Yakashima Japanacorp, Biogene's expertise in metagenetics rivals Pensodyne's. Well known in the Japanese Imperial State and its client nations, Biogene is one of Asia's leading consumer bioware and consumer geneteck service providers as well as a shareholder in the North American Body Enhancement Clinic franchise.

Behind its consumer friendly façade, though, Biogene's agenda takes a darker turn; its interests include metahuman sterilization therapies and metagene reversion or suppression. Biogene's reputation for malice is also well-earned. Since Biogene sided with the Javanese military junta in the '60s, they've expanded their gene and bioware research to produce "warform" biodrones and military-grade enhancements—some of which, if rumor proves true, will be showcased on a tour of several NAN and European nations later this year.

Designer Genes (Monobe)

Monobe's geneteck subsidiary deals with the design of recreational genes, chimera, and other animal transgenics (though they have been playing around with metahuman "material" of late). Industry buzz is that some of their achievements would turn Dr. Moreau green with envy, especially since they've developed a pool of renowned gene artist freelancers.



Their Merdeka Research Park in Jakarta is just one of their massive artistic laboratories for the production of mass market and limited collectible chimera (like the Constant Bloom™ line of flowers) as consumer products. Designer Genes recently announced it will be releasing its first ever range of phenotypic genetweaks starting this fall, through a worldwide partnership with Nightengale clinics.

Genecraft Biodesign (Renraku)

What Tan Tien is to the biosector, Genecraft Biodesigns is to the genetic research field. Not one of Renraku's core interests, Genecraft focuses on researching and patenting genes, genemods, gene therapies and synthetic viral vectors for exorbitant licensing fees and royalties. Several smaller corporations outsource special projects to Genecraft labs—though the company always retains part of the property rights of any original developments to which they contribute.

Genecraft also possesses expertise in unexpected areas, such as paracritter genomics and experimental novel protein development. Their labs in the Mangalore-Bangalore-Chennai Axis, Singapore Cluster, and Oslo are believed to be on par with Universal Omnitech SOTA facilities, though far more focused on exotic geneteck applications than their competitors.

General Genetic Worldwide (AG Chemie)

GGW is the genetics branch of AG Chemie. Though they are not a global player when it comes to products and genetic enhancement, they have had significant success in the biomedical and pharmaceutical sector. They also have a bad reputation for metahuman experimentation. As a leader in the research of chemical and biological agents, they've clashed with NGOs and allegedly violated the Copenhagen Accords on numerous occasions—though to their lawyers' credit, they've thus far dodged official Corporate Court indictments or sanctions. Another area of focus for GGW is the further development of the mycoprotein, tank meats, consumable fungi, krill, lupine, and soy products that fuel their parent company's food business.



Genesis Consortium

This South American AA is making waves as it continues expanding their genetech and biotech interests. Though their genetech primarily sees use in macro-biotech and industrial projects (from biodome materials to waste processing systems), some of it trickles down to personal augmentations such as biotech symbionts. Genesis is also famous for their application of genetech to reforestation and eco-sustainable technologies. Because of that, they've been granted unprecedented access to the Amazon Basin and its native species—and the pharmaceuticals, genomes, and any genetech derived thereof.

- That's not their only exclusive. They've got exclusive access to the Galapagos Islands too. Security remains awfully tight, but there are rumors that they might have meaningful leads on specific meta-traits and creating transgenes for paranormal traits.
- Marcos

CUSTOMER APPS

Posted By: Kephalos

As an independent salesman for cutting-edge genetech, I received a request to give a short introduction on the range of products my trusted clients offer to those of you who are interested in and can afford geneware. Since there are widespread misconceptions about what engineers can achieve today, I added an introductory technical overview about common practices in the field of genetic engineering.

- I see you are still around, Kaminsky. The last time I saw you, you were brokering biotech deals for my former husband at Universal Omnitech.
- KAM
- I still do, though I've ventured into the gene business since Genetech is on the rise. But I'm lecturing the professor—you know this better than all of us put together, Doctor.
- Kephalos

GENETIC ENGINEERING

Genetic engineering is the academic term for the process of manipulating genes, usually outside the organism's natural reproductive process. The aim is to introduce new physiological characteristics. This can be anything from a herbicide-protected plant to bacterial manufacturing, even ultimately to metahuman enhancement. Genetic engineering and biotechnology are usually inseparable, with genetic alteration being the prerequisite for the creation of bio-augmented organs (bioware) and transgenic organisms like plantfacs or fabricows (aka pharm products).

The process starts when a geneticist identifies the gene for modification or insertion. Once that decision has been made, the DNA sequence can be replicated outside of the organism, and modified as needed. There are a variety of mechanisms for synthesizing and modifying the DNA as necessary, with the most popular being customizable nanites. These so-called endonanites are built to recognize a certain type of DNA site and either cleave them or connect them. Others can synthesize DNA stretches from nucleotide building blocks or move DNA around. While biological molecules were used in decades past, these nanites are

controllable, programmable, adaptable, more robust and work in unison with each other under flexible conditions. In the last decade, they have become a versatile tool when it comes to the manipulation of sequences on a micro level.

Gene Delivery

Altering genes requires an efficient and safe method to deliver the modified DNA into the targeted cells. Pure viral vectors possess high intracellular efficiency, but they don't always put the DNA where you want it to go. That's an enormous problem when considering metatraits. Non-viral vectors often have a greater flexibility when targeting specific organs or specialized tissues, but they're substantially more expensive.

Most modern gene therapy uses one of two delivery approaches. The first is the synthetic virus. If the therapeutic goal is to introduce a completely new protein, this has proven to be an effective vehicle. The downside is that it's like shooting an apple off of somebody's head with a shotgun. You'll hit the target, but there'll probably be side effects.

The second approach is gene delivery with the assistance of nanotech. Nanite-assisted microbubble cell permeation is the most advanced method on the market for inserting DNA into cells. Older "gene gun" nanites that carry DNA and a molecular injection system are the most common vehicles used in clinical therapies that can't afford the medical nanotech.

Gene Therapy

While gene delivery techniques can easily alter features in single cells or simple organisms, it is much more challenging to alter a mature, multicellular organism. Gene therapy does exactly that. Originally created as treatment for replacing defective genes in genetic disorders, it has become a method of choice for augmentation. This macro scale, simultaneous manipulation of the genome in trillions of cells, is an arduous procedure requiring dozens of different techniques. Legions of nanites are essential, but so are swarms of viruses and the reinsertion of cells modified outside of the patient with reagents that are just too toxic to use any other way. That's why gene therapy takes weeks at best and months in most cases. If you're planning an extensive work-up, try to have everything done at once. Otherwise, you could easily spend years of your life unconscious, motionless, and submerged in a vat while nanites rewrite your blueprint.

YOU ARE WHAT YOU EAT

Growing transhuman trends, changeling-posers, and sex-hoppers fuel the hype behind the branches of biotech companies, but much of the real money comes from the grass-and-roots biotechnology that does not need a clinic. Consumer products are the most common augmented goods. You would be surprised how many ways biotech influences our lives.

Foodstuffs today are designed, bioengineered and patented before being produced en masse. Meat surrogates like mycoprotein (protein-rich mold and fungus cultures), krill, soy, and enriched algae are grown in huge fermentation tanks by biotech giants such as Ingersoll & Berkeley or Genetique. When critical biomass is reached, the meat-to-be is processed, textured, flavored, and packaged for shipping.



INCOMING FEED.....

When genetically-modified foods from transgenic plants were introduced in the last century, plant life became patentable. Even with genetic modifications, though, the development and yield of plants is hard to predict. No matter how ingenious the design, nature has a knack for slipping in unforeseen side effects. Growth of economically valuable plants (rice, soy, wheat, corn, cacao, coffee, tobacco, cotton, and most fruits and vegetables) is thus often bio-assisted. Three to four harvests a year is typical, with accelerated growth and genetic resistance to harmful insects, pathogens, and weak pollutants as standard features.

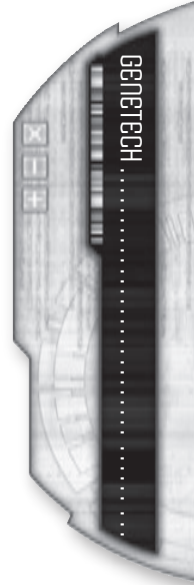
- And let's overlook the damage done to the environment and ecological cycles by this "green" biotechnology. These aberrations are like soil vampires, sucking the nutrients from the ground until it's little better than ash. The "compensation" of modern fertilizers makes the ecological impact even worse.
- Ecotope

The use of transgenic plants and domestic animals does have its drawbacks. Food allergies have become endemic in the last five decades, and not every product is labeled correctly. Additionally, one in thirty people today are allergic to soy thanks to its overuse in the '50s and '60s. Agricorps are researching adequate replacements such as lupine or complex synthetics. I pity

radical groups like GenePeace or Food Watch. Their just causes are doomed to failure as long as consumers favor the bigger, juicier, and cheaper "frankenfood" apple over the more expensive natural counterpart.

- Choice is for those who can afford it. I doubt that the lower echelons of society have seen much of that lately.
- Plan 9
- Hey! I've been living out of Stuffer Shacks my entire life and I'm as healthy as a devil rat.
- Slamm-O!
- Stands to reason, since you have the eating habits of one.
- Puck

If an organic process can synthesize a substance, then an organism can be designed to make it cheaply—this is known as "pharming." Adding the gene of choice and triggering its expression in the fruiting bodies of a domestic plant means that purification of a pharmaceutical can begin as soon as the plant is harvested. Similar tricks have been done to create fabricows—where the relevant molecule can be extracted directly and consistently from a cow's milk.



GENEDESIGN—THE ART OF CREATION

Genetic engineering continues to boom today. There has been a paradigm shift since the turn of the millennium, however. Modern genetic design is not exclusively about industrial applications, nor is it even a strictly medical treatment. Instead, gene therapy has become a socio-cultural phenomenon and art form. If you believe the blogs, it's due to the transhuman tide society is riding since the transformation of changeling freaks and the emergence of technomancers. Personally, I think it is a matter of personal liberty, freedom, and choice. Genetic techno-progressivism or liberal eugenics is a product of our technological society, not a fashion trend. It is something fundamental to society and shares the same basis as the enthusiastic global acceptance of the wireless Matrix. This is something that I—as a Swiss gadgeteer—can fully understand.

Homo Sapiens Superior

People have always strived to enhance and improve themselves, going from cybernetics to biotech to nano- and geneware. Genetic modification, though, can be so much more than just short-sighted augmentation. Of course, it is less obvious than cyberware or bioware, though modern DNA scanners can detect most genetic augmentations. The true value of geneware lies with what no other modification can ever achieve: surpassing the limit of your own species and heredity.

Procreational beneficence is the catchphrase here. Non-genetic implants can make you stronger or faster, but they are artificial to your body. As “gear,” they can fail you since your body has to cope with the unnatural stress to your metabolism. Genetic alterations change your whole self on a more fundamental level. Genetic reprofiling can make you smarter or tougher without any implantation although you can even mix in those to further push your limits. Haven't you ever thought of a human having an ork's strength without the appearance that only a mother can love?

- I know he's a pro, but his anti-metahuman bigotry is starting to tick me off.
- Clockwork
- Maybe you learn a lesson here, then.
- Netcat

Superiority is not the only reason people invest in genetech these days. Genetically modified traits are often hereditary, meaning there is a chance of passing those genes to the next generation. It is an investment for the future if you plan to have a family. By cleaning up your own genetic background, you won't pass any diseases to your progeny. Further, you can pass certain special abilities along. This evolution of mankind is the reason why the gene biz is currently prospering.

- One should note that geneware is often recessive. In cases where both parents share the same modification, however, it is often passed to their offspring.
- The Smiling Bandit

Designer Babies

Another issue is genetic design of the unborn. The field of genecraft babies has seen quantum leaps in recent years, but it remains expensive, comparable to anti-aging treatments in the '50s. All geneware available to an adult can be achieved by nano-assisted genetic engineering after *in vitro* fertilization. The specter of designer babies has been used to block research since the late twentieth century, but I doubt that designer appearances in children will become a fashion trend. You can do so much with biosculpting, and trends change so fast that it hardly makes sense to bother on a genetic level.

- I abhor all these genetic modifications. Man was never meant to play god and reinvent himself.
- Ecotope
- If we were all so narrow-minded, we would still be living in the Stone Age.
- KAM

Transgenic Art

But design goes beyond function. Transgenic art is not intended to cure diseases or enhance mankind. Those geneticists who create masterpieces from DNA don't use their knowledge to create the nastiest pathogen or the cruelest abomination. They create new organisms, plants or animals because they *can*. The process of creation is their passion and a way to express their art. For a gene artist, DNA is his lump of clay.

Today, one can change cosmetic features such as color, size, smell, and life expectancy. They can even craft replicas of extinct species or transgenics that blend unrelated animals into chimera. These unique pieces are valued among collectors (like any other art). Ichiro Iwamura, one of my clients and a premiere gene artist, showed a *de novo* animal design at a recent Hamburg exhibition. Reviewers raved that its appearance was completely unlike any known natural animal. As most breeds are meant to be unique, they are usually non-reproductive and genetically watermarked. This has created an emerging market for designer pets among the ultra rich and corporate elite.

Being Metahuman

So what does all this mean? Some people will eventually find themselves driven to ask, “with all this gene tinkering going on, when do you stop being metahuman?” The answer, of course, is never. How could it? The very drive to improve and enhance our forms to the pinnacle of metahuman achievement is the core of the metahuman experience. The shells we are given mean nothing in comparison to the minds and spirits that reside therein.

Private Message...



Hey, *compañero*. I know some gray-market *biopiratas* in Caracas doing a little genetic bootlegging. They'll pay oro on delivery (if you don't mind Azzie corporate scrip) if you happen to bring in a trademarked critter or its genetic blueprint. Interested? – *Marcos*





- This is such bullshit. We're like children playing with matches. So much of this technology is new and persistent; we have no idea how this will interact with genes down the line, or what will happen a few genetically-engineered generations from now. We're altering the air we breathe, the food we eat, the water we drink, and our own bodies. What will happen down the line is anyone's guess, but odds are it won't be good.

- Ecotope

- It's not as dire as all that. There has been a substantial body of research leading to the implementations we have today. While I won't deny that some processes being marketed today see profit before protocol, the corporations can't afford for anything to go spectacularly wrong. It's in their best interest to ensure nothing gets out of hand.

- KAM

- And you would know about that, wouldn't you KAM?

- The Smiling Bandit

GENETIC RESTORATION

Genetic restorations are committed to the development and commercialization of treatments to address unmet medical needs. These encompass medical technology focused on counteracting damage or impairment on a genetic level.

Augmented Healing

Brand Names: Proteus ZeroGamma, Shiawase Reblissum, UO Allcare, Biogene Cleanser

Healing is the process by which cells regenerate and repair to reduce the size of a damaged area. Healing incorporates the removal of necrotic tissue and the replacement of that tissue. Augmented healing acts by enforcing the regeneration of cells otherwise unable to multiply due to damage or differentiation. Techniques include de-and re-differentiation, as well as the activation and improvement of the host's own DNA repair systems. Augmented healing has proven the only therapeutic technique to heal radiation damage, even in cases of acute radiation poisoning.

Age Rejuvenation

Brand Names: UO Leónization, Evo Ankh, Genetique Cellternity, DocWagon Supercentenarian, Shiawase Da Fang, Telestrian Methuselah

Known colloquially as Leónization, this is a genetic anti-aging treatment that rejuvenates the body at the cellular level. A potent combination of gene therapy and cellular repair, it restores the individual to the physique of a young adult, reversing the aging processes. A cryogenic sample of DNA stored before aging occurred is required for the genetic restoration. Most SINners have started depositing those "pure" DNA samples as soon as they reach adulthood. The downside is that these samples go right into databases that the corps have access to. Later samples risk perpetuating or exacerbating genetic damage during the treatment. While prohibitively expensive in the '50s and '60s, advancements in genetech and nanotech have made these techniques more affordable. Developments in gerontology allow for related treatments that can slow the aging process without the downtime required for rejuvenation or restoration of youthful vigor and without cosmetic change.

Revitalization

Brand Names: UO Elán

Universal Omnitech was the first to introduce a restorative treatment for xenotechnical implants. As cybernetics become less popular, many people wish to exchange their synthetic enhancements for biological ones. That trend has led to a movement to restore true "life force." While cloned biological counterparts can replace cybernetic prosthetics, an impairment of the host's aura persists. The Elán treatment restores that impairment, bringing the body back to its primal status provided that the implants have been removed from the body. The details of the treatments are classified, though geneticists have speculated that it involves a unique viral strain.

- Genetic rumormongers say that it is based on an engineered variant of HMHVV.

- Hannibelle

PHENOTYPE ADJUSTMENT

Phenotype adjustments are changes on the genetic level without the introduction of non-metahuman genes. They encompass a variety of remodeling procedures that change the patient's genetic profile. While some improvements appear to be "superhuman," phenotypic adjustments only alter the existing genes.

DNA Masking

Brand Names: Masque, Reprint, Shuffle, GeneClean

Forensic genetics is a subdivision of forensics that deals with the analysis of DNA in criminal investigations. Because each person's DNA is unique, a clean sample can positively identify the perpetrator or the victim of a crime. While DNA fingerprinting is fast and commonplace, providing identification and genetic profiles within milliseconds, it's not foolproof. Genetic techniques can also mask those "fingerprints." DNA masking is a standard gene therapy practice, altering the DNA just enough to evade match by forensic analysis.

- Here's a story for the oddity section. There are places where women hand in DNA samples to get a genetic profile of a target—for marriage. Having a husband with a clean genetic background means a lot to corporate women, especially if they care about their future offspring and their role as a mother in the corporate family. Mingle in "HR-guided matchmaking" and you'll find out more than you ever wanted to know about good corporate breeding.

- Mr. Bonds

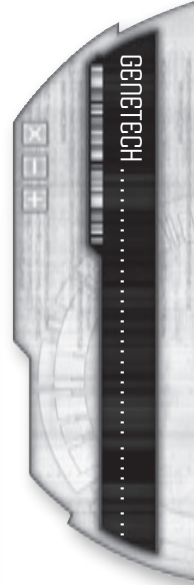
DNA masking is a costly procedure involving tank immersion and extensive genetic reprofiling, so it's nothing that can be done on an outpatient basis, like cosmetic bioware. It goes without saying that it's highly illegal. Nevertheless, I know a number of clinics around the globe that cater this service to a clientele of criminals and corp refugees.

Genetic Optimization

Brand Names: Pensodyne Ascension, Proteus Superior, UO Prodigal

Genetic optimization is one the most difficult genetic treatments. It works to redefine the limits of one's genetic background. It generates an improved predisposition of either physical or mental traits by the modification, introduction and excision of a





plethora of different genes. These collective changes provide the target with a heightened potential for strength, vigor, or intelligence compared to a non-modified counterpart. The premise is that these “prodigal abilities” are fostered and challenged to develop. The genetic insight to do so was acquired by characterizing metahumans displaying special abilities (autistic savants, wunderkinder, whiz kids displaying mental or physical aptitudes) for over four decades by Universal Omnitech.

- If you don't train your new muscle structures, you won't tap the full potential. Same with the brains.
- Snopes

Phenotypic Alteration

Phenotypic alterations, often referred to as cosmetic geneware, are usually performed for metahuman cosmetic alterations that cannot be performed by biosculpting. Minor alterations include a sixth finger, remodeling of fingerprints, and alignment of facial features. Major alterations include ethnic transformation (e.g. turning an Asian into an African-American) or a significant change of stature.

TRANSGENICS

Transgenics is the science of intentionally introducing a foreign gene or series of genes into a patient genome. The objective is to optimize a species, regardless of sapience. Once livestock were exploited, it was a logical progression to develop transgenic applications for metahumans.

Enhanced Protein Exchange

Brand Names: Pensodyne Neo-EPO, Pensodyne Daredrenaline, Shiawase Vasocon, Genetique Hyper-Glucagon

EPE gene-mods are the most common transgenic treatments. These enhance the subject by exchanging naturally occurring genes with upgraded versions or by adding in a new synthetic protein. The protein can originate from another species or be *de novo* substances that have proven to generate an enhancing effect. A recent popular example is Genetique's Adapsin hormone, which makes cybernetics less invasive.

Environmental Microadaption

Brand Names: Proteus Toxonaut, Evo Spaceraider, Proteus Allpionier, Evo Atlantean, Proteus Tuareg, Proteus Polar Explorer

True environmental adaptation requires massive modification of metabolic processes to tailor the body to the requirements of a hostile habitat. Since full adaptation has the drawback of limiting survival in mankind's native environments, these transgenic procedures aim for environmental flexibility. This enables the patients to alternate between different environments. Changes made on the genetic level through the introduction of foreign genes allow bodily functions to work “normally” in otherwise hostile environments. Targeted environments range from extreme temperatures to the bottom of the ocean, to the radiation of deep space. As marine and space colonization is on the rise, this has been a greater focus for corporate interest. These adaptations are vital for humans, but even more crucial for food crops in these same environments.

NGO-PAEDIA QUERY

GenePeace

GenePeace is a Scandinavian extremist policlub that campaigns and fights for strict regulation of genetic engineering. Decades of conflict with multinational genetech companies, food industry corps, and governmental biowarfare installations and a public smear campaign, orchestrated by Meridional Agronomics, finally pushed the organization over the edge into the extremist deep-green direct-action camp. With the recent surge in popularity of transhumanism, GenePeace has started to target the offices and members of transhuman policlubs such as the Transhuman League with arson, assault, and even mutilation of genetically altered body parts.

Immunization

Brand Names: UO Antigen, Genetique Resistance, DocWagon LongAid, Genetique Prophylaxia

Immunization therapy fortifies the immune system against a specific agent. Engineering immune cells can alter tailored hybridomas to produce antibodies that grant near-immunity to specific disease pathogens or toxins. Usually these antibodies respond quickly and prevent systemic propagation, although they are known to fail in the case of fast-acting poisons like neurotoxins.

Another variant of immunization therapy alters the targets of certain toxins (receptors, biological systems) through gene therapy, rendering the compound ineffective. In recent decades, immunization treatments have been improved and are now able to remove some allergies altogether.

Transgenic Alteration

Transgenic alterations have recently become extremely popular. During the mid '60s, the chimera hype leaked into genetic alterations as well. Since then, companies have come up with transgenic splices that change metahuman phenotypic traits to non-metahuman. While unusual hair and eye colors or fluorescent traits are the simplest modifications, genetic mimicry of changeling traits has become a popular branch. I have seen frog or snake tongues, reptilian hides, and skin that renews itself by molting and peeling. The sky's the limit—though the long-term and hereditary ramifications of this level of genemodding are still unknown.

- If I ever see someone with antennae, mandibles, or insectoid eyes, I will likely put a bullet in his head before considering that it is just a transgeek asshole who chose the wrong modifications.
- Sticks
- No wonder GenePeace loves these gene-tweaking companies.
- Ecotope



INCOMING FEED.....

GENETIC INFUSIONS

Posted By: Marcos

If I wander through Chacao (that's the bio-district in Caracas in which the underworld shapes their *muñecas*), I see the true victims of modern genetechnology, hiding and dwelling in the shadows. These are the poor that were looking for some cheap upgrades, and the desperate that had no choice but to gamble with things they barely understand. *Mierda*, they got more than they ever bargained for, if you ask me.

Bio-clinics around here have been testing some new genetic add-ons in the past year. They're called genetic infusions and my bio-doc urgently advised me to avoid them. According to the doc, these infusions are cocktails of DNA vectors (read: synthetic retroviruses and transgenes) used to insert them temporarily into the genome. I know people who were too blind to see the risk and took a shot. Supposedly, the changes are temporary until your system clears out the foreign DNA, but I saw some of them mutate and die over days or even weeks.

This thing is becoming popular and several syndicates have been sniffing around the local suppliers, so expect to see these showing up on your local street corners soon enough.

- Apparently UO didn't bury this failed project deep enough. Pity.
- KAM

GENETECHNOLOGY RULES

Genetechnology encompasses a wide range of techniques that involve the direct manipulation and material expression of heredity in biological life: DNA.

The myriad applications of genetechnology in medicine, agriculture, and metahuman enhancement have long been a topic of heated social and political debates. Its widespread use in 2070 is simply another staple of megacorporate dominance. With the advent of extraterritoriality and the balkanization of state power, it was impossible for the megacorps to ignore genetechnology's potential to improve health, cure and treat diseases, create a safer and more secure food supply, attain a more sustainable environment, and generally cash in on a plethora of profitable applications.

Unraveling the secrets of the genome to tap into its full potential—above and beyond metahumanity's baseline—quickly became a prime goal of many research departments. The process has not been without its obstacles and setbacks—the substantial data loss linked to the Matrix Crash of '29 and the mysteries posed by metagenes and the magus factor are just two of them. Nor has it been without fortuitous windfalls, such as insights brought about by the mana-related Sudden Recessive Genetic Expression of 2061.

GENETICS AND SOCIETY

Genetic manipulation in all its forms and applications, from genetically-modified products to anti-aging gene therapy, is more than an emerging force in the Sixth World—it's a fact of life.



Besides megacorporate interests, there are a number of factions and trends with a major focus on genetics.

UGE, Goblinization, and SURGE

The Unexplained Genetic Expression (UGE) that introduced dwarfs and elves to the Sixth World, Goblinization that brought orks and trolls, and later SURGE all underscored the existence of an unknown link between ambient mana levels and the expression of genetic metatraits.

Unlike UGE and Goblinization, the SURGE phenomenon was the result of a spike in mana levels and did not result in new subspecies of metahumanity. Instead, SURGE produced more variants and unique biological expressions in both baseline humans and metahumanity. Victims of SURGE, later named changelings, manifest a variety of unique mutations and genetic expressions. The cause or causes are still a matter of heated debate. Theories range from environmental factors to skewed interaction between astral shadows and “junk” DNA.

As with UGE and Goblinization, it has become clear that SURGE traits are hereditary. Many changeling newborns express their parent’s traits. It’s also been shown that in almost 50% of newborn cases, new SURGE expression can also occur to children with at least one changeling parent. More details on SURGE and full rules for changelings will be featured in upcoming *Shadowrun* products.

Reprogenetics and Genetweaking

An increasingly popular trend is to tweak and enhance children from the womb to better equip them for life’s rat race. This application of genetic engineering to unborn embryos and fetuses is known as reprogenetics. It allows for extensive modification to both phenotype and genotype. These “designer babies” are denounced by legitimate and radical individuals, pundits and policlubs who oppose meddling with the genome. Their reasons vary from religious grounds to fear of eugenics, to principles of social equality.

Genetweaking, the modification of infant or adult metahumans through gene therapy, is also becoming popular. Though the costs of genetic treatments make them uncommon, such genetic modifications are becoming more widespread amongst those who can afford them. The number of genetically altered people, or “genecraft,” is on the rise.

Several qualities are available to characters who are genecraft, as noted on p. 20.

Transhumanism and Posthumanism

Fringe social, intellectual, and cultural movements that see emerging sciences and technologies as a means of overcoming the innate flaws of the human condition have been around since before the Awakening. Most such movements, colloquially known as *transhumanist*, espouse the use of technology to enhance mental and physical abilities beyond the metahuman norm. The transhumanist goal is to challenge the constrictions of the metahuman form—aging, death, stupidity, disease, and other undesirable limitations—to attain a *posthuman* existence. Genetics represents a powerful tool in the transhuman arsenal. Unlike corporations or governments, who keep an eye on profitable innovations, transhumanist organizations are often more ambitious and daring in gene

modification. With the emergence of changelings and technomancers, these groups have become more mainstream. Significant genetweaking and body modification is far more common among transhumanists than mainstream society. Heavily-modified characters may find acceptance amongst transhumanist groups.

GENE THERAPY AND HOSPITALIZATION

In *Shadowrun*, the term “gene therapy” describes the various techniques used to transfer and splice genetic information into cells and tissues to achieve some desired effect. It leads to fundamental changes in the genomic information in all of the host’s cells with the potential of passing on the changes to offspring. To achieve this effect, an unimaginable number of cells have to be altered simultaneously or sequentially. This is usually achieved by immersion in a nutrient tank, while nanites and other vectors simultaneously alter the patient’s DNA.

While transfection methods vary greatly, their end effects, treatment times, and prices are very similar. The cost of gene therapy includes medical supplies, hospitalization, and tailoring the transfection vector to the subject.

NATURAL VS. TRANSGENIC

Unlike cybernetics, Essence loss from geneware is not a matter of invasiveness. As with bioware, the condition for Essence loss is its foreign nature. Genetic restorations such as age rejuvenation and augmented healing are treatments to restore patients back to their native forms.

Phenotype adjustments are more substantial changes, which result in minor Essence losses. These reflect mutations that have been known to occur in nature, but are not natural to the patient. Some of these have even arisen spontaneously or by exposure to mutagens like radiation, pollutants, UV, or even food additives.

Transgenics refers to inserting genes that originate from either non-metahuman species or *de novo* designs. These can lead to major metabolic or phenotypic alteration. They are considered “foreign” in terms of biological systemic stress and cause Essence loss.

All geneware Essence costs are calculated as part of the character’s total Essence loss from bioware.

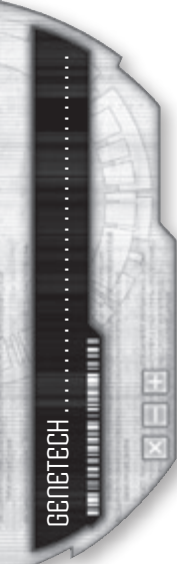
Geneware, Essence, and Grades

Geneware, the colloquial term for metahuman gene therapy, is rarely tailored to a specific individual. Individual vectors are corrected and adjusted to facilitate integration. Change on the genetic level is so complex that it cannot take factors that arise from the unique genetic background of a recipient into account. Side effects from cross-reactions with other genes are normally corrected during the treatment. Because of this, geneware does not come in grades like cyberware or bioware.

All bonuses from geneware treatments are subject to a character’s relevant maximum augmented ratings.

GENETIC RESTORATION

Genetic restorations are medical genetic treatments to cure diseases, remove negative side effects of aging, or otherwise strengthen health. They work to restore and boost the body’s own genetic baseline.



Age Rejuvenation

Each rejuvenation treatment requires one major therapy session, usually followed by a number of maintenance sessions every six months for the next three years to ensure that the treatment is wholly effective. Depending on what kind of age rejuvenation treatment is applied, it can restore physical youth, restore youthful vigor, or expand life expectancy without restoration of physical health.

Regardless of which treatment is administered, age rejuvenation can only be performed a limited number of times before the cumulative effects of forced regeneration make cells go into bio-shock and cytodetachment (this option is left to the gamemaster, to be used as an appropriate plot point). Also note that even a treatment this powerful cannot totally prevent the ravages of time—brain chemistry, for example, must be largely unaltered or the patient runs the risk of losing much of their memory and acquired motor skills. Certain conditions such as Alzheimer or Parkinson’s diseases cannot be corrected without the use of other therapies.

While life span extension and physical youth treatments can be combined, Léonization is exclusive and cannot be combined with any other age rejuvenation treatment.

Léonization: Léonization has a significant impact on holistic health as it attempts to reverse the natural processes of the body—aging and death. The therapy resets the genetic mechanism that controls aging, effectively rebooting cell life to its youthful prime. After treatment, the patient is restored to a physical age of approximately twenty-one.

Life Span Extension: Contrary to the other treatments, life span extension doesn’t usually require follow-up sessions. One therapy session is enough to increase the life expectancy up to 10 years by slowing down the aging process and eliminating some of the known effects of aging.

Physical Vigor: While Léonization restores physical age, this treatment deals with the side effects of aging—often called the “felt age”—without altering the aging process. This improves quality of life and results in 60-years old with the vigor and robustness of an adolescent.

Augmented Healing

Augmented healing is a whole-body therapy that restores the body to its full genetic health template. The treatment will heal all remaining boxes of damage on the patient’s condition monitor, even if magical healing has already been applied. Augmented

healing will also restore damaged organs and re-grow severed limbs (including the spine), though the treatment time usually takes longer (upper treatment time limit). Unnatural implants like cybernetics, bioware, and transgenic geneware traits impair the treatment, so tailored nanites are employed to buffer those implants from bio-rejection during regeneration. In such cases, the cost of the process is increased by 25 percent, though treatment time remains the same. This procedure cannot be used to repair damaged cyberware, though it can be used to repair protein-matched bioware. The regeneration of a single damaged bio-implant costs 25 percent of a standard treatment; treatment time is at the lower limit of the scale. All augmented healing treatments require a healthy sample of the subject’s DNA.

Cellular Repair: This specialized regenerative treatment repairs permanent cellular damage caused by neurotoxins or radiation, eradicates resulting disabilities, restores attribute loss due to disease or severe physical trauma, and even heals Essence loss inflicted by a critter with the Energy Drain or Essence Drain powers (see p. 288, *SR4*, and p. 99, *Street Magic*). It will not fix hereditary problems or disabilities integral to the subject’s own genetic expression.

Corrective Gene Therapies

The simplest gene treatments, corrective therapies group a number of different treatments that address undesirable hereditary disorders, genetic flaws, propensities, and predispositions such as progeria, muscular dystrophy, hemophilia, sickle cell anemia, propensity for cancer, and Down syndrome. Each treatment corrects, treats, repairs, or removes the genes or precursors that have been linked to one hereditary defect or condition.

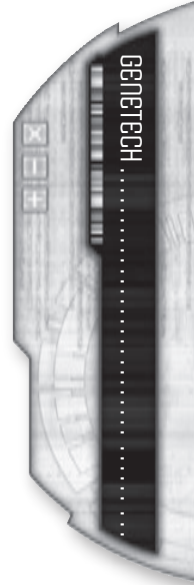
Revitalization

Revitalization is a recent breakthrough that repairs Essence loss derived from invasive implantation. Universal Omnitech is trying to keep the mechanism a secret, though geneticists have speculated that the effect is achieved by performing some kind of “genetic feng shui.” The theory is that scientists realign qi from astral shadows by genetically remodeling DNA to repair damage to the aura or balance to the body’s systems, and thus the patient regains Essence.

In game terms, revitalization regenerates the Essence “hole” left by the removal of an implant from the body. Revitalization is slow and Essence is restored by recurring gene therapy sessions at

Genetic Restoration	Treatment Time	Essence	Availability	Cost
Age Rejuvenation				
Léonization	3 months+	—	12R	400,000¥
Life-span Expansion	2 months	—	10R	250,000¥
Physical Vigor	2 months	—	10R	250,000¥
Maintenance Session	1 month	—	—	50,000¥
Augmented Healing	1 week–2 months	—	8	15,000¥/week
Cellular Repair	1 week–2 months	—	8	15,000¥/week
Corrective Therapies	1 week	—	4	15,000¥
Revitalization	0.1 Essence per month	—	12	75,000¥ + 20,000¥/month





a rate of 0.1 Essence per month. Though Essence points lost to implantation, Energy Drain, and addiction may be restored through gene therapy, Magic/Resonance points lost are never returned and reductions to the maximum Magic/Resonance attribute remain in effect.

Revitalization can be performed without permanent hospitalization during the treatment time. Characters have to spend at least 7 days per month in the clinic to continue the treatment. If the character has not attended the clinic for two months the treatment stops and has to be started anew (including the starting costs) to continue the effect. Note that this treatment cannot be attempted if the implant is still present.

PHENOTYPE ADJUSTMENT

All phenotype adjustments require the same treatment environment as gene therapy and include all genomic changes that involve the addition or modification of only natural, metahuman genes.

DNA Masking

Making oneself unidentifiable to gene scanners or faking data bank information or SIN registry to evade positive identification is highly illegal. Nevertheless, DNA masking is in high demand at black clinics catering to the underworld, the shadows, espionage organizations, and special ops divisions.

Genewipe: This treatment is a major genetherapeutic procedure that inserts a tag into the body's neurotransmitters that triggers accelerated cell death whenever these cease to receive regular neurochemical signals from the body—causing epithelial cells and hair to decompose more rapidly when they are removed from the body. As a consequence, biological trace evidence left by characters with this treatment irrevocably deteriorates after five minutes (rendering it useless for genetic profiling or ritual samples).

Masque: This treatment changes parts of the character's non-coding sequence so that a DNA scanner will not produce a positive identification when searching normal genome ID databases. While most DNA scanners will report a not-found result, some high-end scanners (Rating 6+) may indicate the absence of certain marker elements and report that further identification is required by other methods.

Reprint: Reprinting establishes a new genetic profile changing commonly tested polymorphisms within the genome to create a new and unique genetic fingerprint. Only the new pattern is rec-

ognized by gene scanners or identified by genetic fingerprinting. Even if full genome sequencing is performed, there is no way to unambiguously identify the individual genetically.

Shuffle: The amount and types of genetic modifications that a subject possesses can be concealed by careful reorganization of gene structures. This requires an extensive analysis of the patient's genome, in order to set up the best places to conceal the modifications. It is not foolproof. This adjustment raises the threshold for identifying genetic modifications by genetic fingerprinting by 1.

Genetic Optimization

Genetic optimization permanently increases physical and mental potential by tweaking the genes responsible for the development of a given attribute. This is considered a major genetic change. Each time a character undergoes gene optimization, he may raise his maximum *natural* attribute rating (and consequently his maximum *augmented* attribute rating) in a Physical or Mental attribute of his choice by one point. Each attribute can only be perfected in this manner once.

Like the Exceptional Attribute quality (p.78, SR4), this treatment does not raise the attribute itself—meaning the character must still spend Karma to raise the attribute as usual (see *Improving Attributes*, p.264, SR4). This adjustment is compatible with Exceptional Attribute.

Phenotypic Alteration

Phenotypic alteration can create virtually any change to the body within the limits of metahuman norm. This treatment can elongate limbs, change skin tone or color, add horns, modify hair, change overall build, and so forth. The limits are left to the game-master's judgment, but a good guideline is to disallow obviously inhuman changes such as extra limbs, non-metahuman sensory organs, non-metahuman features or anything more fanciful. Specific changes may be incompatible with organ replacements such as cyberlimbs, cybereyes, bioware skin, or cosmetic modifications.

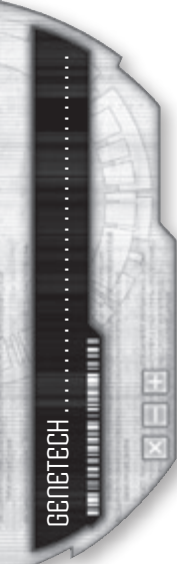
The following changes are common Phenotypic Alterations.

Ethnicity Alteration: This treatment can achieve complete or partial ethnic alteration of ethnic characteristics from one to another, both physically and genetically.

Print Removal: Finger or palm prints can be completely removed by interfering with the natural process that leads to the development of skin ridges. This yields patternless fingers, toes,

Phenotype Adjustments	Treatment Time	Essence	Availability	Cost
DNA Masking				
Genewipe	2 months	0.2	16F	45,000¥
Masque	2–3 weeks	0.1	10F	25,000¥
Reprint	1 month	0.1	12F	30,000¥
Shuffle	1 month	0.2	12F	30,000¥
Genetic Optimization	2 months	0.2	10	45,000¥
Phenotypic Alteration	2–6 weeks	0.1–0.2+	8	40,000¥+
Ethnicity Alteration	4 weeks	0.2	8	40,000¥
Print Removal	2 weeks	0.1	8F	25,000¥





palms, and feet. Print scanners will report that the subject must be identified by a secondary method.

Metaposeur: This treatment genetically changes you to physically resemble a particular metatype (or metavariant), without actually granting any of their native advantages or disadvantages. For example, this enables a human elf poseur who really wants to *look* like an elf to do so, though he gains no low-light vision or longevity.

TRANSGENICS

Transgenics encompasses all treatments by which non-metahuman genes and traits are spliced into the recipient's genome.

Enhanced Protein Exchange

Exchanging the genes of key proteins for optimized versions can alter bodily functions with an adjuvant effect. Similarly, specially designed synthetic proteins can be added to the subject's genome to optimize the efficiency of various processes. The following are examples of what can be produced by enhanced protein exchange. Gamemasters and players are encouraged to develop other protein enhancements.

Adapsin: Adapsin is a catchphrase for two proteins that can reduce the impact of non-biological implants to an organism. True adapsin is an immunoprotein that limits bio-stress upon implantation of cybernetics by down-regulating inflammatory response. The second protein produces a secreted polysaccharide that coats the implant with a bio-film, making the body believe that it is a normal organ, thus limiting xeno-rejection and immune response in the long term.

Adapsin reduces the Essence cost of implanting cyberware (but not bioware) by 10% (round normally) if the subject has *previously* undergone adapsin EPE treatment. This reduction is in addition to reductions from alpha-, beta- or delta-grade cyberware. Adapsin is new to the market in 2070 and should not be available at character creation.

Daredrenaline: Characters that possess daredrenaline use a modified version of the "fight or flight" hormone adrenaline and its natural receptor. This causes a greater mental alertness than the normal hormone, granting a +1 dice pool modifier on

all Willpower Tests (including spell resistance). Characters with this gene mod become adrenaline junkies and must succeed in a Willpower + Logic (3) Test to actively resist taking unnecessary risks or remaining in dangerous situations.

Double Elastin: A complex of collagen and elastin proteins normally forms a matrix to hold the body's organs and tissues together. This enhancement of the elastin protein increases the flexibility of this framework, granting +1 natural Impact armor (this bonus is cumulative with worn armor and other armor bonuses). Characters with this enhancement suffer from slightly degraded blood flow, and so receive a -1 dice pool modifier on all Fatigue Tests. Implanting two or more cyberlimbs cancels out the effect of this treatment.

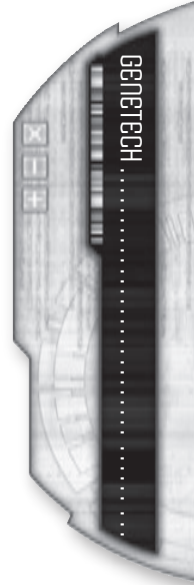
Dynomitan: The dynamin protein is closely tied to the speed of neuronal transmission due to the cell's ability to absorb neurotransmitters. Dynomitan is an enhanced version of this protein, expressed exclusively in the sensory regions of the brain. Characters with this modification receive a +1 dice pool modifier to Intuition-linked skills. Characters with this modification are also prone to distraction. When they notice something of interest, they must pass a Willpower + Logic (3) test to not drop the task at hand. This enhancement is incompatible with synch.

Hyper-Glucagon: Glugacon is a vital intermediary in the metabolism of energy stores in the body. Hyper-glucagon accelerates the liver's conversion of glycogen into glucose, ensuring a steady supply of energy and a protein-driven hyperactive energy boost. Characters with hyper-glucagon double all listed times when dealing with the effects of Fatigue (p. 155, *SR4*) but require a higher caloric intake to maintain healthy energy levels (increasing their lifestyle costs by 10%).

Magnesense: Ferric iron reductase is a protein that produces a biological iron cluster, called magnetite. In migratory animals, clustering of magnetite is associated with their ability to know when and how to migrate. Selective expression of this protein in the inner ear allows the subject to sense the presence, direction, and intensity of magnetic fields, such as those generated by electronics, power supplies, or magnetic anomaly detectors, as a low thrumming

Transgenics	Treatment Time	Essence	Availability	Cost
Enhanced Protein Exchange				
Adapsin	1 month	0.2	16	30,000¥
Daredrenaline	2 weeks	0.1	6	25,000¥
Double Elastin	2 weeks	0.2	8	12,000¥
Dynomitan	1 month	0.2	8	25,000¥
Hyper-Glucagon	2 weeks	0.1	6	20,000¥
Magnesense	2 weeks	0.1	6	20,000¥
Neo-EPO	2 weeks	0.2	6	25,000¥
PuSHeD	1 month	0.1	8	15,000¥
Qualia	1 month	0.4	8	25,000¥
Reakt	1 month	0.4	10	30,000¥
Synch	1 month	0.3	8	30,000¥
Vasocon	2 weeks	0.1	6	25,000¥
Vegsin	2 weeks	0.1	6	15,000¥





sound. This modification also grants an unerring ability to identify magnetic north. The character makes a Perception + Intuition Test to detect these emanations within a range of 1 meter.

Neo-EPO: Erythropoetin (EPO) is a hormone that stimulates production of red blood cells (erythrocytes), commonly used as a performance-enhancing additive in professional sports for over a century. Neo-EPO increases oxygen retention and athletic endurance by insuring a constant supply of oxygen. Characters with Neo-EPO receive a +1 dice pool modifier for all tests made with skills from the Athletics skill group and Fatigue Tests.

PuSHeD: The PostSynaptic HyperDensity protein modification increases the size of neuronal bundles throughout the central nervous system. This has statistically been shown to grant an increase in subjects' IQ. Characters receive a +1 modifier to Logic-linked skill tests.

Qualia: Derived from a reptilian species, this hormone stimulates neural activity in the reptilian hind mind and the sensory-dedicated lobes, ultimately affecting the intuitive subconscious grasp of sensory information. Qualia is believed to be a form of organic storage of raw empirical data associated with prior sensory stimuli, which can reinforce a subject's ability to absorb and react to input from their environment (even on a subconscious level). Characters with this modification receive a +1 dice pool modifier to all Intuition-linked skill tests.

Reakt: Reakt is a transgenic neurohormone released by the pituitary gland during stress, enhancing perception to the degree that movements are perceived as if in slow motion, making it easier to react to situations or incoming dangers. Characters with reakt get a +2 dice pool modifier to all Reaction Tests to defend themselves (combat, Indirect Combat Spells, etc.). Reaction-linked skill tests, Initiative, and Surprise Tests are not affected by this modification. This effect is cumulative with all other augmentations that enhance Reaction.

Synch: Synch is a nootropic protein that affects cognitive abilities in the brain cells of the visual cortex. This enhances intuitive comprehension and pattern recognition abilities. Characters receive a +1 dice pool modifier on all Perception Tests. In addition, recipients accustomed to combat situation develop a battle awareness based on fighting styles and moves, which allows them to respond and adapt quickly to their opponent's fighting style. When in combat, the character receives +1 die to all combat tests against each opponent after the enemy's first attack. This enhancement is incompatible with Dynamitan.

Vasocon: Angiotension regulates blood flow through the body. It causes capillary beds to contract and stimulates water retention. The enhanced vasocon has a greater vaso-constrictive

effect that is useful in situations of massive blood loss. When a character with this treatment takes damage that overflows his Physical damage column by less than his Body attribute, additional damage due to blood loss and shock accrues at the reduced rate of one box per (Body Rating x 2) Combat Turns. Characters with this mod develop hydration insufficiencies (accelerating the onset of Fatigue to half its normal time in hot climates).

Vegsin: Pepsin proteins are expressed in the gut, causing protein breakdown and playing a critical roll in digestion. The vegsin family of proteins is synthetic, derived from herbivore proteins associated with breakdown of cellulose structures. While they're nowhere near as effective in a metahuman as in a true herbivore, they do substantially increase digestive efficiency. The character's lifestyle costs are reduced by 10 percent.

Environmental Microadaption

Environmental microadaption usually requires massive transgenic alterations of metabolic pathways and is therefore considered a major genetic change. These therapies require several months to splice in new proteins and balance the consequences in an environment that simulates the conditions to which the body is adapting. Since changes are far-reaching, microadaptions are mutually exclusive.

Cold Adaptation: Adaptation to cold environments modifies the subject's metabolic processes to maximize internal heat retention. Transgenic restructured and isolative adipose and skin tissues, adjustment of interstitial and cellular fluids to lower temperatures, and cold-shock protein machineries that refold proteins under arctic temperature denaturing conditions protect the body against the effects of extreme colds. Characters that have undergone such treatment get a +2 dice pool modifier when resisting cold- or ice-related primary and secondary damage, in addition to a +2 dice pool modifier for cold-environment Survival Tests. This treatment is incompatible with dermal plating or sheathing, bioware skin augmentations, a metabolic arrestor, or a suprathyroid gland.

Heat Adaptation: Heat tolerance is conveyed by increasing water retention to avoid dehydration, speeding blood flow to increase heat diffusion, and using heat-resistant proteins that do not break down at higher temperatures. Skin layers are transgenically reinforced to protect against burning. This enhancement allows the character a +2 dice pool modifier for resisting any heat or fire primary and secondary damage by covering the skin with a moist film. The character also receives a +2 dice pool modifier for hot-environment Survival Tests. This treatment is incompatible with the same implants as cold adaptation.

Low Oxygen Adaptation: Adaptations for environments low in oxygen replace a few metabolic pathways with anaerobic

Transgenics	Treatment Time	Essence	Availability	Cost
Environmental Microadaption				
Cold Adaptation	3 months	0.5	6	40,000¥
Heat Adaptation	3 months	0.5	5	40,000¥
Low Oxygen Tolerance	3 months	0.5	4	35,000¥
Microgravity Adaptation	3 months	0.5	4	30,000¥
Pollution Tolerance	3 months	0.3	5	35,000¥
Radiation Tolerance	3 months	0.5	6	35,000¥





INCOMING FEED.....

equivalents originating from bacteria. Additionally, an adapted subject is usually outfitted with enhanced versions of hemo- and myoglobin in his bloodstream. These allow the subject to survive in a low-oxygen environment for an extended period of time. In game terms, the character can also hold her breath for Body x 5 minutes before feeling an urge to breathe again. Characters with this alteration require specialized diets and have an increased lifestyle cost of +10%.

Microgravity Adaptation: The side effects of space habitation and return to Earth-normal gravity are reduced by alteration of bone and muscle density, fluid density, pressure receptors, and the otolith organs in the middle ear. Characters with this adaptation are not subjected to any form of space sickness during launch or landing. Any negative dice pool modifiers imposed for operating under micro-gravity conditions are negated. The character does not require any medical treatment when returning to Earth. This effect is incompatible with bone density augmentation or bone lacing of any kind.

Pollution Tolerance: Engineering pollution tolerance relies on splicing in proteins capable of isolating and disposing of heavy metals or rendering organic contaminants toxins inert. Further, modifications include the enhancement of the body's natural metabolic enzymes to deal with toxins more efficiently and to alter cellular receptors and metabolic intermediaries to be resistant to pollutants. Characters with this adaptation receive a +3 dice pool modifier for the purpose of resisting chemical attacks from pollutants, heavy metals, and other related toxins.

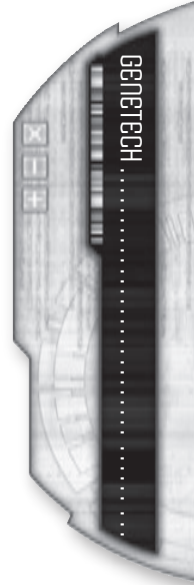
Radiation Tolerance: The body is made less susceptible to radiation exposure and damage from radioactive sources by reinforcing nucleic acid repair and DNA protection proteins. Characters receive a +2 dice pool modifier for resisting damage from "hot" sources. In addition, the character triples the radiation dose that triggers the immediate side effects of light radiation poisoning or radiation sickness (see *Radiation Elemental Damage*, p. 145, *Street Magic*).

Immunization

This therapy infers near-immunity to a specific disease pathogen, toxin, or other compound. Specialized hybridomas are created within the body that produce monoclonal antibodies, targeting a specific substance. These antibodies provide a swift response to a foreign contaminant, bestowing significantly improved resistance on the patient.

Patients can be immunized in this fashion against any common bacterial infection and certain bacterial endotoxins, soft nanites, chemical toxins, and other harmful chemical or biological agents. At the gamemaster's discretion, any given immunity may partially extend to related or similar pathogens or toxins, by halving (round down) their Power. For instance: immunity to VITAS-3 might provide partial immunity to VITAS-2 infections.

The procedure has yet to be perfected against highly mutable agents—such as certain exotic viruses—or artificial agents such as hard nanites that evade detection or cannot be targeted. Basic immunity cannot be made effective against neurotoxins and other quick-acting compounds because they affect the target before antibodies can respond.



A patient can only be immunized against a number of compounds equal to his or her unaugmented Body. Any immunization beyond this disturbs the immune system to the point of failure.

Basic Immunity: The treatment grants the subject complete resistance to normal doses of the particular compound or pathogen. In the event of an abnormally high exposure to the substance, immunity is not guaranteed. The antibodies still assist in resisting the agent, so the power of the toxin or disease is halved in such cases (round down). Determining how much exposure is excessive is up to the gamemaster, contingent on the situation and the compound in question.

Allergen Immunization: By changing genetic predisposition, allergies chosen during character creation can be removed by gene therapy. The cost of the treatment depends on the severity of the allergy (BP value) of the allergy to be removed. Allergen immunization must be undertaken during game play.

Neurotoxin Immunization: Systemic alteration of the specific receptor targeted by a certain neurotoxin can convey immunity against a single type of neurotoxin.

Soft-Nanite Immunization: This immunizations treatment recognizes the most common hulls used for soft nanite technology. The immunization treatment conveys near immunity to all soft nanites, no matter their effect. In case of increased exposures, the rating of the nanite is halved (round down) similar to basic immunity.

Transgenic Alteration

Transgenic alteration is like phenotypic alteration, but it goes beyond the limits of the traditional metahuman form by splicing genes from different species. Virtually any change can be effected, ranging from superficial limited alteration (non-metahuman eye, hair, or skin color and texture) to animal-like amendments. All transgenic alterations are major genetic changes, even if the superficial outcome is minor. Geneticists have tried but so far failed to fully splice metahuman and plant genomes (blossoms or flowers). The gamemaster must decide whether any specific change is incompatible with existing cybernetics or bioware modifications. These alterations may affect the character's social interactions (see *Body Mods and Social Interactions*, p. 20).

Alien Appearance: Alien appearance can include anything from pearlescent, bioluminescent, or fluorescent skin or eye colors to disproportional statures. These traits might be borrowed from experimental laboratory specimens, come from exotic life forms, or from introducing entirely novel biochemical processes

to the organism. Alien appearance is always cosmetic and has no real game effect.

Animal Features: Animal features can include any phenotypic modification drawn from normal animal lifeforms. These might include shaggy lion manes, rabbit's ears, quills instead of hair, tails, claws, and other animal characteristics. Note that such physical alterations do not automatically imbue the subject with animal-like senses or abilities, remaining primarily cosmetic. Full functionality requires much more profound metabolic alterations. Most of the functional changes available through biotech (p. 61) are also possible through transgenic alteration for comparable Essence and nuyen costs but longer treatment times (typically several months).

GENETIC INFUSIONS

An ominous new development in the bubbling cauldron of personal geneware is that of genetic infusion: cheap gene cocktails for those willing to gamble on genetic augmentations. The result of corporate programs to develop ambulatory gene therapies, the technology is in its infancy and is both unstable and dangerous. Nonetheless, several underworld sources (with or without corporate collusion) are pitching it as a low-cost alternative to normal enhancement technologies.

Highly mutagenic, infusions can cause local or systemic alterations. These modifications are designed to insert a number of transgenic alterations in a transient manner. Like drugs, genetic infusions come prepared as auto-injecting syringes, inhalers, and creams. When used, they insert the transgenic DNA into the patient's cells. The DNA is not intended to integrate into the subject's genome, thus these insertions are not permanent changes. Rather, they fade as the transgenes degrade or the cells they were inserted into naturally purge the foreign code over time.

That's the design intent, anyway. It doesn't always pan out. Sometimes one of the inserted genes will manage to integrate into the host genome. When that happens, there are several possibilities. The best outcome is that the gene integrates perfectly in the genome and the character receives all of the intended benefits of the infusion as a permanent enhancement. The worst (and dramatically more likely) outcome is that the infusion inserts into the genome and triggers a metabolic cascade that results in an extremely aggressive cancerous tumor.

Of course, other inconvenient side effects run the full gamut of unexpected phenotypic changes to catastrophic organ failure. In order to generate repeat customers, most genetic infusions also trigger synthesis of an addictive chemical. Only the poor and desperate are

Transgenics	Treatment Time	Essence	Availability	Cost
Immunization				
Basic Immunity	3 weeks	0.1	4	20,000¥
Allergen Immunization	1 week	0.1	4	5,000¥ x Allergy Value (BP)
Neurotoxin Immunization	1 month	0.2	8R	30,000¥
Soft-Nanite Immunization	3 weeks	0.1	8	25,000¥
Transgenic Alteration				
Alien Look	1–3 months	0.2	10R	40,000¥
Animal Features	1–3 months	0.3	10R	45,000+¥



INFUSION SIDE EFFECT TABLE

Hits	Effect
Critical Glitch	The DNA integrated badly. The character develops a terminal cancer and has 2D6 weeks to live.
Glitch	A bad integration causes intense discomfort. The character suffers 2S DV that cannot be resisted or healed naturally or magically.
0	The DNA for the addictive substance integrated but the beneficial DNA did not. The character continues to suffer the infusion's negative effects without gaining its benefits.
1-4	The infusion fades and the character suffers no bonuses or penalties.
5	The infusion integrated perfectly. The character gains the full effects of the infusion as a permanent modification at a cost of 0.4 Essence.

usually willing to take the risks, which has led to reports of mutated abominations taking up residence in the poorest neighborhoods.

For purposes of addiction and effect, genetic infusions are treated as drugs with an Addiction Threshold of 2 (see p. 248, *SR4*). Unlike traditional pharmaceuticals, infusions take three to six hours to take effect. When the infusion duration ends, the character must make an Essence + Edge Test (Edge may not be spent on this test). Consult the Infusion Side Effect Table (above) for results. Only surgical replacement of damaged tissues or augmented healing gene therapy can cure any of these side effects.

Braveheart

Duration: 2 weeks

Effect: +1 Willpower, +2 Impact Armor, -1 Intuition

When under the effects of braveheart, subjects are almost as tough as they think they are. This unstable combination of darenadrenaline and double elastin grants the body the ability to cope with the damage that the user suddenly becomes willing to sustain. To temper this instinct, a transgene to synthesize a tetrahydrocannabinol variant is also imbedded. In addition to the loss of Intuition, the character also suffers a substantial appetite increase. At the end of its duration, the character will need to make a Logic + Intuition (3) Test to recall any activities undertaken while under Braveheart's effects.

Endure

Duration: 5 days

Effect: +2 athletics skill tests, +3 dice pool modifier on Fatigue Tests

Endure is a mixture of hyper-glucagon and neo-EPO with an enzyme that synthesizes a steady dose of caffeine. While under its effects, a character receives +2 dice to skill tests made with skills from the Athletics skill group and +3 dice to Fatigue Tests. During the entire duration, however, the character will suffer from severe insomnia. After the first 24 hours, any Perception Test will require a Willpower + Logic Test. The threshold for the Willpower test is the number of days since Endure was injected. Failure indicates that the character is hallucinating. When Endure wears off, the character must immediately sleep for 24 continuous hours.

Inspiration

Duration: 2 weeks

Effect: +1 Logic, +1 Intuition, -1 Willpower

Inspiration combines variants of the proteins in the PuSHeD and dynamitan transgenic modifications with a protein that synthesizes a very low level of ethanol. The transfection agents are targeted to hit cells of the central nervous system. While under its effects, the character feels a constant state of euphoria and a surge of creative energies. When its effects finally wear off, the character suffers 12S damage from a massive hangover.

Sideways

Duration: 2 weeks

Effect: See Description

A prototype combat optimization, sideways has great potential as a cheap military drug. Using the products of the reakt and synch modifications, the character receives a +2 dice pool modifier on all defensive Reaction Tests, +1 on all Perception Tests, and an additional +1 on all combat tests. Sideways also includes an enzyme to produce an optimized opiate. While under its effects, the character loses all pain sensation. To reflect this, the gamemaster should secretly track all damage that the character suffers. The character will not suffer any wound penalties until he passes out. The subject may make a Perception + Intuition (2) Test to notice injuries as a Simple Action, but will remain unable to gauge the severity of those injuries. When sideways wears off, the character will suffer a-2 Intuition modifier for 12 hours while readjusting to the sensation of pain.

TRANSGENIC ART AND CHIMERA PETS

Transgenic art and chimera pets are two sides of the same coin. Both are living organisms either created or altered by splicing a variety of different genes coming from a number of different sources. Transgenic artists, often referred to as *shapers*, are geneticists that alter the genome for aesthetics using DNA as their palette. They "shape" something new, thus creating art. Chimera pets are trademarked and genetically altered organisms that are marketed and sold as designer pets for the rich and the famous. Both transgenic art objects and chimera are often further modified by biotechnological means.

Transgenic objects, be they plants or animal, can take any form and are often unique. With the advancements in genetech-nology, genetic engineers have already begun to create new life forms from the bottom up. These rare pieces of genetic art are often priceless and shown only during exhibitions, or are sold to collectors for unimaginable amounts of money. A profitable shadowmarket has emerged around these creatures, hiring runners to steal such organisms on behalf of collectors not willing to pay the price in an auction. Since there is an emerging market for chimera pets for the middle classes, genetic bootlegging of altered life forms has become big bio-pirate business.

Genetic Infusions

Availability

Cost

All variants

16F

1,000¥

Transgenics

Availability

Cost

DNArt

10

100,000+¥

Chimera Pet

6

10,000+¥



Understand, this was supposed to be a goddamn couture run. Little place called Semiotech. It's an Evo brand; just a little Philly warehouse where they paid the designers to live like 'authentic artists,' right down to the vintage pine board and cinderblock bookcases in their 'lofts.' Johnson wanted us to nick their upcoming Tempus Fugit designs. I think her bosses planned to release copycat styles a day ahead of Semiotech subscribers, so that rich kids would whine to Mom and Dad when they caught a neighbor with tomorrow's commlink case or shirt.

"It was easy enough to knock out the token security and rough up a few 'artists.' A nice lady in a turtleneck and pre-ripped jeans told us that they back up the TF designs regularly, and that an Evo suit dropped by once a week to get them out of the server with his key. No problem, right? We just used his port. Custom plug, but I've got a smart adapter that takes any shape you need.

"Dotgov—our Matrix man—did his biz and came up empty. He suggested that there was a dedicated machine firewalling him out. So out came the spray can. A microdose of wreckers hit the doors and we were through and down in the basement.

"I like old movies. There's this great 'flick'—that's what they were called—that's about a century old. There's this crazy computer that takes over a house and performs unspeakable experiments. Especially in the basement. It's funny how life imitates art, isn't it?

"I'm not talking about the Arcology. I've read the files you sent me about that, and while the resemblance is striking, I'm actually talking about what we ran into in the basement. We busted another door and ran into this drone. It was just like the old movie: a big, 3D tangram, all polygons sliding into different configurations, spinning around. It extended a little brassy pyramid of a limb that sheared off the top of Dotgov's head. One of the 'artists' chuckled from the top of the stairs (I killed him for that, on the way out) as we backed out of the room. I must have hit something worthwhile with my Predator, because that drone toppled over and crumpled a bit.

"The next door led to the main server. It was off the net, but otherwise had weak security. J-Spark got the data. The whole room was filled with this fog. I thought it was just some kind of active fire suppression system. I was wrong. J's face started to melt off halfway through our drive to the safe house. I think I'm still around because of the universal blue goo I got installed a few months back, but I can't be sure.

"The data? It's all yours, chum. In addition to Tempus Fugit, there's a huge block of encrypted files. I can't jimmy them; Dotgov could, but he's gone. I assume they have to do with the thing in the basement. Just give me a blood transfusion, top up the blue goo, get anything dangerous out of my body, and cut me ten percent.

"Why so little? Well, there's one thing I want you to do. Get me data on the VP in charge of Nanotech R&D at Evo. Payback's a bitch."

AN UNDERGROUND PRIMER TO NANOTECHNOLOGY

Author: Taniguchi, Uploaded By: Fastjack

- Bandit and KAM both vouch for Taniguchi, so I conned the man into bringing us up to speed on the ever-evolving field of nanotech. Like his namesake, Taniguchi is a former Tokyo Science University alumni; he's also head of one of the few indy nanotech labs in Japan. His personal field of interest is nanoaugmentation, so he's particularly suited to bring us old codgers up to speed on what's what in metahuman enhancement. After all, who knows what nasty surprise you might walk into if you don't keep up with the tech curve.
- Fastjack

Nanotechnology is a subtle and pervasive part of the modern world. The nanotechnological revolution has discreetly changed the face of the world and few aspects of our lives remain untouched by some form of nanotech, more so than the average person realizes. More than an enabling technology, it is almost as prevalent as wireless networking. Fields such as cybernetics, aeronautics, smart materials, space exploration and many more would still be in the dark ages without breakthroughs engineered by nanomachines.

The fruits of nanotechnology are omnipresent, but rarely trumpet their origins. Nanotechnology is essential to many things the average person takes for granted from the super-compact optical storage to filtration systems to the humble RFID chip. Those dirt-repelling surfaces on your clothing, furniture, and office building are a product of nanotechnology. Desktop *nanoforges* are changing the way small industries everywhere operate, and odds are that pretty much any sophisticated gadget you own has nanotech-produced components. Your commlink wouldn't exist without the nanotech needed to produce the photovoltaic protein pigment in optical chips or etch millions of logic gates in its processor. Nanite sensors act as controllers in high-temperature engines and as stress sensors and actuators in airframes—and in most, if not all, spacecraft and space stations. Monofilament and buckytubes are found in a bewildering number of applications from armor to monowhips.

Even though the role of nanotechnology in manufacturing is impressive, some of the most exciting applications are in the fields of human (and metahuman) enhancement. Without nanoscale engineering and nanites to continually maintain the bridges to the body's own neural system, cybernetics would be far more invasive. Nanites also control the microscopic circuits that form the retinal displays of cybereyes, weave and reweave the fibers of synthetic polymers used in dermal sheathing, and are used in nearly every kind of modern surgery.

While it's hardly impressive to say that your gear's the product of nanotech—many automated mass manufacture techniques remain faster and more productive—few industrial production methods allow for the same degree of precision or sheer flexibility, and none allow you to “vat-grow” items in single pieces to amazing stress and heat tolerances.

Of course, nanotech poses more than its fair share of dangers. While the much-banded threat of out-of-control “gray goo” is unlikely to ever come to pass, it is undeniable that nanotech has immense and frightening potential as a weapon—as became all

too clear when Winternight fielded weaponized nanites as part of their doomsday plans, killing hundreds of people during the recent Crash.

- For the uninitiated, “gray goo” is an urban myth that out-of-control self-reproducing nanotech could eat the planet.
- The Smiling Bandit
- I'll know the Singularity is here when I can get spray-on episodes of Neil the Ork Barbarian!
- Slamm-O!
- Actually, that's exactly why it *isn't* here. You think the corps are letting anything that makes them obsolete out of their white labs?
- Plan 9

HARD AND SOFT MACHINES

The basic elements of nanotechnology are the *nanites* (technically incorrect but universal slang) or *nanobots* themselves: microscopic machines that work together to affect equally-small physical structures. The smallest nanites are the size of viruses; the largest are barely visible to the naked eye. Implanted nanites are usually about the size of metahuman cells and take advantage of the body's own circulatory and digestive systems to move about. Most are so small they are powered by the body's own organic chemical processes and bioelectricity.

Current nanites are Simple/Repeat Task machines with specialized functions, minimal sensing ability, and no “intelligence” to speak of. Ignoring for the moment the dedicated processors that allow nanoforges and nanohives to retask and reprogram *hard nanites* (I'll get to these in a minute), normal nanites are typically designed with a specific task or function in mind. Though each nanite is limited in size and function, nanotechnology is effective because thousands of nanites working in concert—collectively known as colonies—can accomplish things that a single large machine would be hard-pressed to match. For example, a nanotech colony can help doctors perform neurosurgery that would be dangerously invasive using a laser scalpel and fiberoptic probe, and a nanoforge's reprogrammable colony can turn a hunk of plastic into a trendy dress, commlink case, or pistol grip.

Popular science sims like to distinguish between “hard” and “soft” nanites. *Hard nanites* are made of inorganic materials—diamondoid carbon and aluminum structures being the most commonly used—and resemble scaled-down drones built to take advantage of a frictionless environment and to affect their surroundings on the microscopic scale. Colonies working in concert are capable of incredible feats.

- Lots of popular sims use hard nanites as MacGuffins or threats. If I remember correctly, *Posthuman X* spent half a season dealing with them; you got to see little mechanical bugs when the heroes studied them through an (inaccurately depicted) atomic force microscope. In fact, even though hard nanites use mechanical principles, they don't really look like that, except for a few mite-sized versions that are modeled on insect biomechanics. Soft nanites aren't as prevalent in the popular imagination, but can be as effective as their mechanical counterparts.
- The Smiling Bandit





M. Grandee

Soft nanites are composed of engineered proteins and resemble living cells and virii. This is partially because these structures are incredibly efficient, partially because soft nanites are “bred” from genetically modified strains of bacteria, virii, phages, and specialized cells—all neutered to avoid undesirable replication and mutation. Evolution’s done an excellent job of providing working examples for research to follow. Soft nanites tend toward the smaller scale of nanomachines. Even though they tend to be less hardy and can’t reproduce, they can replicate organic chemical interactions and biological functions with incredible precision.

• No unique nano-organisms have been patented to date; all soft nanites are derived from existing biological templates. No corporation has yet succeeded in fabricating a biological construct from scratch. Instead, they must adapt and coerce what nature has already built, using biochemistry and genetic manipulation. Protein nanotech is still the “holy grail” and the subject of intense espionage efforts.

- KAM
- Nanotech bugs me. I don’t trust stuff I can’t see.
- Marcos
- You don’t trust much, then. Nanotech is used in most areas of manufacturing, from circuitry to the latest fashions and designer drugs. It’s pretty much everywhere.
- Fianchetto
- There’s even beneficial medical nanoware that can live in your bloodstream and seek out and destroy viruses and other maladies as they find them. Sort of like a jacked-up army of white blood cells.
- Nephrene
- I don’t need no stinking army of microscopic machines in my body, thanks. Who’s to say they don’t run out of control?
- Marcos

CONTROL AND AUTONOMY

For the longest time, the greatest hurdle in developing useful nanites was the issue of control. Individual nanites are just too small to control via remote computing, and external control wires are usually impractical or impossible for a colony. Each nanite must therefore incorporate its own processor capable of responding to external cues, enough memory to carry out its task, and microreceivers. Individual nanites are not much more complex than a pocket calculator.

The problem has been partially overcome with the perfection of diamond circuitry and polymeric memory structures, combined with advances in knowbot holistic command structures—meaning processors usually take up no more than half a nanite’s mass.

Nonetheless, the manufacture of complex mechanisms and items remains well beyond the capability of autonomous nanite systems. Such projects demand dedicated hardware and software packages such as those integrated in nanoforges which coordinate and send simple commands to the nanites in the nanoforge’s “vat.” For extremely large projects requiring adaptability, an external expert system is needed to direct the nanites—colloquially named *nanohives*.

• Recent developments with the emergence of AIs and technomancer sprites have left a lot of people worried about the potential of these Matrix entities to subvert nanohives or nanoforge expert systems. Corps are rushing to upgrade the firewalls and failsafe protocols on nanoforges—nobody wants another Arcology debacle on their hands.

- Beaker
- Never tried hacking a nanohive. I wonder how a sprite would handle such a grid. I’ll give it a try and post what happens.
- Netcat

Auxons

The idea of autonomous nanites able to self-replicate—called *auxons* by scientists—has been around almost as long as the technology itself and lies behind the popular myth of a “gray goo” doomsday. “Goo,” is a bit of venerable slang that’s been used to describe such nanites for over 90 years. This dates back to early fears of “gray” goo capable of destroying the ecosystem. Stepping back from that for a moment, though, autonomous auxons have great potential in a number of fields. This might be the backbone of nanotech in thriller sims, but in truth, nanites able to reproduce in an uncontrolled environment are highly experimental and well-guarded by their corporate owners.

Our technology hasn’t progressed to the point where reproduction does not consume most of the nanites’ limited processing ability. So while nanite breeds exist that are able to produce other nanites from raw stock, this is all they are able to do, and short of reprogramming, this renders them unable to perform other functions. Very few nanite breeds possess this capability, and most demand a specific feedstock to work with. Those few that can be programmed to accept certain materials “as is,” are rarely able to process any significant variety of materials.

COMMON APPLICATIONS

Nanotechnology is so widespread that every megacorp performs at least a minimal level of research and development in all major areas, even if just to avoid surprises by their competitors. Beyond basic research, different megacorps specialize in specific aspects of the field. Over the last five years, this afforded megacorporations a certain amount of protection from competition, and there seemed to be tacit agreement to maintain stable niches within this industry.

The number of industries and sciences that employ nanotech is a phenomenal, but anyone reading this is wondering where the serious money is. Well, while medical nanotech and augmentations represent the most spectacularly burgeoning field, there’s cutthroat competition in pretty much all fields and nanotech can crop up in the most unexpected uses. Given nanotech’s versatility, there’s obviously plenty of overlap between similar applications in different fields. The following summaries outline what to expect out on the cutting edge.

Heavy Industry and Manufacture

The industrial sector began implementing basic nanotechnology as far back as the late ’50s, and the trend has accelerated dramatically in the last decade towards a multi-billion nuyen industry of nano-scale refining, molding, machining, etching, and



assembly. Today, nanite-based manufacture plays vital and growing role in various industries producing everything from compact optical chips to massive jet engines. The leap in mechanical efficiency has been such that today's nano-produced components and materials behave in ways unbelievable even twenty-five years ago. Nanomanufacturing requires sophisticated facilities—the nanoforges I mentioned above. Even though the term conjures up images of a single, big vat/machine teeming with nanites, the fact is that the actual process involves several production stages and conventional assembly techniques. Keeping nanotech from becoming more widespread is the hefty buy-in and maintenance price tag. A nanoforge facility is costly; a typical corporate setup is, at minimum, a ten-million-nuyen investment, not counting ancillary personnel, real estate, and conventional assembly facilities. Developing and programming the nano-level design specs that nanoforge expert systems use as construction blueprints is also a difficult and time-consuming task—far more so than their conventional analogs.

Nonetheless, nanoforges can engage in the advanced engineering feats responsible for things like buckytubes, artificial gemstones, and smart materials. Beyond ultra-strong and ultra-light materials, the biggest impact of nanotechnology on industry has been the fabrication of complex items as single parts—structures without seams or stress points can be designed to far higher tolerances. Though slower than contemporary robotic mass assembly, building machinery in a single step is economical. A “vat-grown” jet turbine that doesn't require further assembly can typically perform 10 or 20 percent above normal limits and is comparatively cheap to produce.

Nanotechnology is also burgeoning in the environmental industries—for instance, nanites see widespread use in waste and water purification systems, and variants of demolisher nanobots are used to neutralize various dangerous toxic wastes.

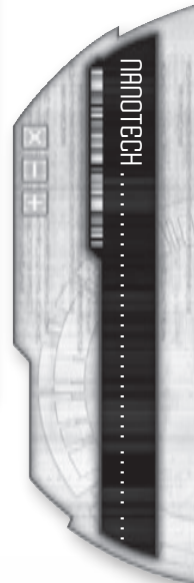
- Speaking of off-beat applications, agribiz is one area you don't normally associate with nanotech. Nonetheless Wuxing has research fields in Cambodia and Mongolia blooming with experimental GM-crops that depend on nanotech to limit nutrient and soil depletion.
- Johnny No

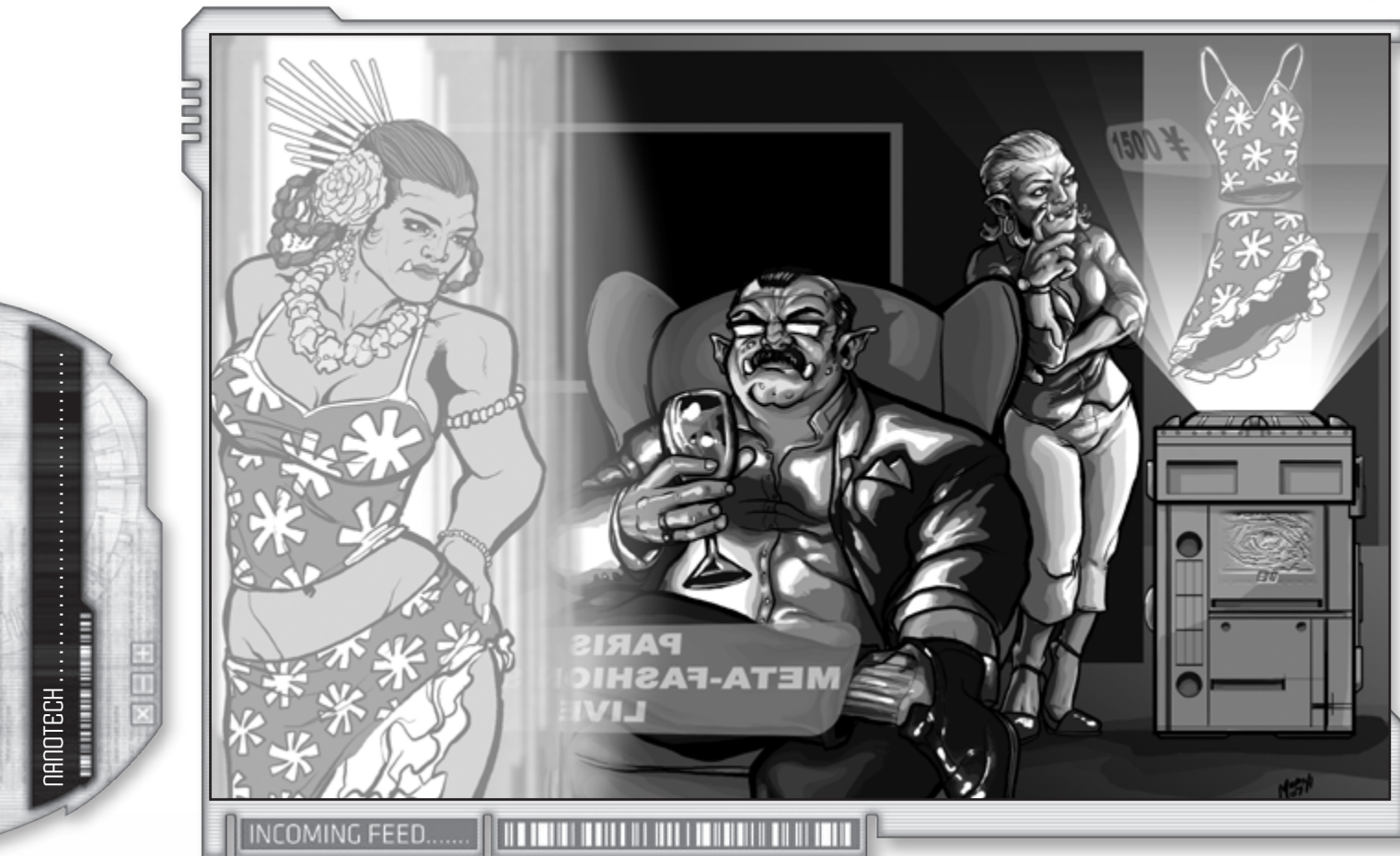
Mitsuhamma and Saeder-Krupp are said to compete for the pole position in nanotech-driven heavy industry. The stakes are typical: dull in the details yet lethal enough to spill blood over. Shiawase and Renraku, the other two major players, are watching from the sidelines and taking potshots. Meanwhile Ares Macrotech has been making inroads in this arena too, applying the expertise it siphoned from Cross to its core conventional industries.

- Ares's focus on “nanizing” its vehicle and drone production reflects the fact that it's actually still trailing behind the other megas. Many of its recent successes are the result of a well-organized campaign of industrial espionage against its major competitors.
- Cosmo
- So that's who shelled out for that MCT whitelab hit. You're the man, C!
- Beaker

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365 Days. 365 Nations. Worldwear® knows that you've outgrown the nest of a single culture, and that your personal fashion needs come from around the world. Metatribe™ fashions nanofax you tailored interpretations of a new nation's fashion, every day of the year. Begin the week in a neotraditional Japanese Power Kimono and end it in Afroflash Massai robes. Program your selection month by month—or let us surprise you!





- I heard of one run where the Johnson hired a team to hack a nanoforge site so that it would build a prototype firearm, pack it along with a bunch of normal rifles, and ship it off to him. Of course, I've also heard that the runners nicked the delivery van and took the gun for themselves. It's supposed to peg a flea at half a klick.

- Black Mamba

- Ah, but was it embossed with your favorite cartoon character?

- Baka Dabora

Desktop Nanomanufacturing and Nanofaxes

Companies such as Evo, Renraku, and Horizon, as well as many lesser corporations, have been hard at work on making desktop nanoforges and nanofaxes a reality, and in the past couple of years a number of models have hit the market.

The companies developing these machines, however, have no intention of undermining their own industrial assets. Under the guise of making it compact and (relatively) portable, they've made the technology of both types of machine significantly less flexible than full-blown reprogrammable industrial nanoforges, both in terms of scale and versatility.

Desktop nanoforges are the more versatile of the two technologies; they allow users to introduce their own *nanospecs* (or license e-templates from the original manufacturer) and build components or small items on demand. The largest of the newest generation of desktop forges have a vat section that's only a cubic meter in size to limit the volume of manufactured items. Other

limitations of desktop forges also tend to be built-in. While ideal for machining mechanical components and very simple electronics, the specifications of the nanohive controlling the nanites keeps them from producing nano-level constructs and complex microelectronics, or from doing molecular engineering (ie. all of which are necessary for cyberware, advanced electronics, optical chips, and nanites amongst innumerable other applications). To ensure a tight leash, different corporations also try to control feedstocks, software upgrades, and more importantly, access to nanospecs—the blueprints the expert system uses to actually build from.

Nanofaxes are the playthings of the elite and exclusive boutiques to whom design is everything. More versatile than commercial nanoforges, nanofaxes are ultimately more limited. They are specialized nanoforges that offer no way of externally programming nanospecs into the system, instead downloading licensed nanospecs from secure servers. Users may select a design from a list available—Postrave designer partyware, custom commlink slipcases by MetaTribe, Inspired by Hermes e-bracelets, Zoe apparel that premiered on a French catwalk twenty minutes ago—and the nanofax churns it out in minutes. Private nanofaxes are unheard of outside the homes of corporate VPs. Everyone else must resort to nanofax boutiques for these expensive bits of vanity gear. The exorbitant price charged is a combination of the licensing costs of a design and simply knowing that the clientele can pay the markup.

Evo, Renraku, Horizon, and MCT all lease the nanofaxes, license nanospecs/designs, control feedstock replacement, and

franchise a chain of boutiques of their own. Smaller corps iNfinity, MetaTribe, and Iris Software (a Renraku subsidiary) make a bundle just producing nanospecs for designers and other corps.

- Even though most runners can't afford an n-forge or nanofax services, its rise has created a whole new employment niche. These so-called "couture runs" involve sending a team to steal the latest nanofax designs. This can drive competing sales or direct economic warfare, where the client releases a variation on the design ahead of its planned debut.

- The Smiling Bandit

- I remember one job where the target—some runaway VP's kid—shot at me with this ridiculous plastic thing. When we caught her, I pocketed the toy. Turns out next year an Aztechnology subsidiary will be selling these things in the form of the BattlePez line: a bunch of non-reloadable .22s with your fave cartoon characters embossed on the grip! The built-in ammo sucks and it doesn't shoot straight, but it's awfully cute. Of course, it also costs more than a real gun, so go figure.

- Hard Exit

As an added security precaution, enforced by ICC regulations and international convention, all nanoforges and nanofaxes must be programmed to etch serial numbers on their constructs so these can be backtracked to a particular machine and producer.

- Of course, they say that the Yakuza and other wealthy mob groups have nanofaxes of their own, but people will say *anything* about the Yakuza, won't they? Seriously, though, if I were an amoral mob boss, I'd probably want my own, hacked 'fax. File this one under "unconfirmed, but likely."

- Snopes

Consumer Nanotech and Fashion

Evo is the world leader in personal nanotech products, as well as a pioneer in nanofaxed designs. It has competitors, but Evo has a reputation for possessing the trendiest nanofax designs and coolest personal nanogadgetry. Among other things, this has allowed Evo to bring the high-fashion market to orks and trolls: metahumans who have traditionally been discriminated against by Italian, Swiss, and Japanese fashion houses and jewelers. Evo isn't alone, though—it's chased closely by Renraku in several fields and Horizon is the rising star in consumer-oriented nano-goods. Most of the latter's products are not as innovative or high quality, but they're cheap and well-distributed. The young megacorp has concentrated on nanotech design and nanite programming instead of widescale manufacturing. What nanotech applications it does manufacture are oriented toward youth fashion trends. Hot items include altskin and nanopaste trodes. They do have some nanoforge facilities, but many of them are test beds for designs that Horizon plans to franchise to its nanofax clients.

Several minor corps are turning significant profit off the nanodesign boom for both nanoforges and nanofaxes, amongst them Danish iNfinity, Russian Digitalis, Pueblo MetaTribe, and Canton-based E-gear, all of which navigate a shark-infested market and turn a tidy profit.

CONSTRUCTION

Saeder-Krupp, Shiawase, Evo, and the Genesis Consortium all possess construction subsidiaries exploring the potential for nanite-built structures. Researchers have concluded that living structures are the most efficient construction models, so the small buildings produced thus far have an organic architecture, with curved support structures and biological forms.

While progress is kept under lock and key, in 2069 Saeder-Krupp showcased its dominance in this field by employing the technology to erect its Portland office complexes. Recently they've announced plans to open their first-ever Seattle offices using the same methods in 2071.

- Ah, yes. S-K's "Living/Seattle Operations" concept building. S-K employees have already nicknamed this the "Lost/Stock Options" building because the execs who earmarked to bunker here are all in the doghouse for screwing up. Lofwyr's condemned them all to a glorified PR position as an "executive in residence," a kind of guinea pig who is supposed to showcase how the building supports "next generation corporate working space concepts." Some of these fellows are ruthless bastards who aren't especially happy about the position they're being put in, so if you can get by the suffocating level of security it's bound to have, you might be able to get work.

- Snopes

The theory is simple: technicians seed a prepared site with stockpiles of requisite feedstocks and hard nanite colonies coordinated by onsite nanohive units. The nanites combine the materials present and mold the structure per the nanohive's commands. Nanotech construction usually requires several breeds of nanites working in concert and heavy supervision. The day where someone might use nanite "magic beans" to create the beanstalk of their dreams has yet to arrive, but current technology is sophisticated enough to rapidly erect small structures with minimal human labor. Military forces have also shown an interest in this technology because it would allow them to quickly erect fortifications and hardened command posts with minimal manpower.

- He's right with that Jack and the Beanstalk analogy. You don't "grow" buildings overnight. Constructors can be about as fast as conventional building techniques, but that's about it. What they can do is put together flawless surfaces, seamless walls, and other neat tricks.

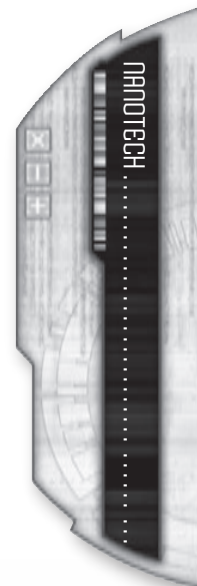
- Picador

- Proper feedstocks are another potential issue. Constructor nanites can pretty much mould plasticrete at will, but give them the wrong ingredients and the nanites aren't intelligent enough to know better. Result? Structural weaknesses. Evo had a major setback with a project in Vladivostok thanks to sabotage.

- Glitch

COMPUTING

The computer industry has employed different nanofabrication solutions since lithographic circuit etching reached its absolute physical limits in the teens. By the '40s, the industry standard became nano-produced optical computer chips, reliant on photoactive protein pigment to act as the binary logic circuit.



Until the early '60s, major hardware developers focused on parallel architecture optical chip designs to expand capability, but it was breakthroughs by Mitsuhamas and Novatech (now NeoNET) that ushered in the second generation holo-lattices in current optical chips that allow sophisticated parallel architectures.

- Suffice it to say, Novatech's patents were registered less than 48 hours after Mitsuhamas' and differ only in the 3D arrangement of the optical logic gates. Novatech was sloppy and MCT had a strong case for industrial espionage—and would have won a Corp Court suit had the second Crash not rolled round. Rumor has it NeoNET settled “amicably” with MCT, and the Japanese walked away with a license for the new wireless protocols for a bargain.

- Glitch

Mitsuhamas and NeoNET share a twofold focus on nanomanufacturing and nanotech-driven computer design. Mitsuhamas' nanocomputing initiatives, however, concentrate on entanglement-driven information technology. The theory is that you can “teleport” a small number of particles a short distance by transferring their quantum states. Used as a form of communication, this might allow Mitsuhamas to create data networks that aren't limited by the speed of light. The potential applications for riggers (who currently have to endure delays when they control some space-borne drones) alone are staggering.

NeoNET on the other hand is testing the limits of nanite programming sophistication and data storage. Nanites are currently capable of relatively simple computation, but NeoNET envisions smarter and adaptive nanites able to perform the functions of several individual “breeds” when necessary. In keeping with its focus on information infrastructures, NeoNET has also been developing open source nanite programming and manufacturing standards.

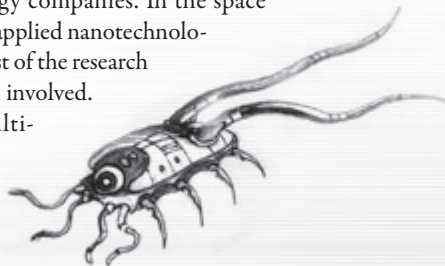
- On a less esoteric note: while most people are looking at the latest and greatest in optical storage, several megacorps are exploring the use of nanolathing techniques to increase thermal conductivity and reduce diffractive errors in standard fiberoptics. Applications range from aerospace to drone tech, and Ares Arms is the black horse in this race.

- Rigger X

Aside from Mitsuhamas and NeoNET, Renraku and Shiawase are the two other big names in this arena, though the latter two focus on nanoforge expert systems, nanite management firmware, and next hardware components.

SPACE EXPLORATION AND EXPLOITATION

The aerospace industry is rich with potential for nanotech applications and has long had a beneficial and profitable partnership with nanotechnology companies. In the space race, the gains from applied nanotechnology offset the high cost of the research and implementation involved. Nanotech is the ultimate enabling technology in



space and crops up in everything from aerospace engineering to off-world mining to micrometeorite repair systems.

Even in this day of mass drivers and orbital industry, near space exploitation is still contingent on economic viability and whether payload weight remains the most decisive factor. Whether moving earth-to-orbit or between the celestial bodies, weight contributes to maximum acceleration/deceleration and hence to flight times and mission costs. New nano-engineered materials allow a substantial reduction in the payload weights without sacrificing reliability or safety, but that is only the beginning. If rumors prove true, we can expect nanotech to revolutionize space travel further as nano-produced diamondoid lattices and carbon buckytubes enable the construction of an equatorial space elevator.

- The big boys might consider *auxons* too dangerous a technology to pursue earthside, but you'd better believe they're studying ways of using them up the well.

- Orbital DK

- There's buzz in certain quarters that the Big Ten are already deploying *auxons* to both produce the elevator cable and hollow out the habitat on the asteroid they're inserting into orbit for the space elevator project in record time.

- Plan 9

- I've heard of constructors used on off-world mining ops, but that seems a bit fanciful. Somebody set me straight, but I don't think the tech is that advanced. It does remind me, though, I need to sniff around for more intel on the elevator. The Kilimanjaro mass driver may be old news these days, but it sure shook things up when it went online. This will be even bigger down the well.

- Orbital DK

All major corporations (and various governments) with a presence in space make ample use of other nano-derived technologies. Saeder-Krupp, Ares, and Evo, for instance, already employ nanotech in numerous functions in their off-world habitats and mining stations. Evo and AresSpace have also deployed first-generation “lightsails” to power out-system probes (other applications include energy-collection for stations and earth-bound microwave powerstations).

Considering that manned missions represent unnecessary risks and expenses, deep space exploration has become the province of highly sophisticated autonomous drones—nanotechnology expanding their operating parameters. Nanite colonies can be retasked to perform many complex operations from fixing micro-punctures to asteroid mining and core sample retrieval.

The stakes in the space race have never been higher and any little edge makes a difference. Industrial espionage in this field is at an all time high, both on Earth and up the well.

MILTECH

Construction is just one of many potential applications for the defense industry; decades of initiatives in the military sector have led to a great many miltech applications. Obviously nano-augmentations, like other forms of metahuman enhancement, also see military and security applications—though costs



restrict these to special forces. Nanomanufactured composites lie behind much modern body armor and lighter, more efficient weapons. Diamondoid-composite armor is one example of an application that has gradually become the standard for heavy tactical equipment.

Thankfully nanite-based weapons are much rarer. The infamous shrike nanites, originally designed for special operations, found their way to the street years ago, but newer iterations exist. Other equally devastating nano-systems exist both in security and military roles, and the danger of them falling in the wrong hands remains very real—as demonstrated by Winternight's use of the weaponized nanite breed known as surtr during the Crash.

Other military applications would also be desired in other contexts. Self-repairing equipment, temporary taggants, and nanospies are all employed by elite corporate and governmental forces.

- Following the Crash, the Corporate Court has imposed some pretty restrictive rules on potential nanotech WMDs. The big boys have all come to an informal agreement not to field them on penalty of an Omega Order. Very retro, like last century's Mutual Assured Destruction doctrine.
- Cosmo

Though Ares, Aztechnology, Renraku, and Saeder-Krupp are all believed to possess nanoweapon programs, it is Eurocorp Zeta-ImpChem that you've probably seen in the news—and for the worst reasons possible. Their new “cutter” class nanites were leaked and would have become a public relations disaster for the company had it not responded by giving certain governments unprecedented access to its next generation of nanoweapons. This hardly stemmed the black market in lethal nanites, but did spread liability around enough to protect the company.

Aztechnology and Ares are believed to have taken their nanoweapons research even farther, but both corporations are understandably close-mouthed about their research. Despite the fact that they employ a large number of nanotech researchers, neither has yet showcased any other truly distinctive applications.

Security and Law Enforcement

Besides defensive measures and military applications, nanotech serves numerous other functions in security, intelligence and law enforcement. For instance, nanites can function as both passive and active taggant systems. The use of nanites as taggants ensures that these do not deteriorate and are not counterfeited. Proprietary commodities can be laced with simple nanites that carry a specific chemical code, allowing a company to detect counterfeits or copyright breaches. As some of those reading this may already know all too well, in some jurisdictions specialized nanites are injected into dangerous felons, etching a unique metallic imprint on the individual's bones as a sort of hard-wired passcode—RFID nanocapsules are becoming more common. These methods can be used to track the prisoner within the institution or allow easy tracking of parolees by police. Several of the more paranoid megacorporations are rumored to use such methods as “un-forgable” IDs, and as a means of tracking or controlling the access of their employees within their securest facilities.

Taggants are only the tip of the iceberg. Several intelligence services, corporate and otherwise, have deployed first generation nanospy surveillance and tracking systems in the past couple of years. Micro- and nanodrones are also becoming quite popular in some circles. And let us not forget altskin disguises and similar innovations. The designs are ingenious and the brains behind them—working primarily for small companies like mine—are highly sought after.

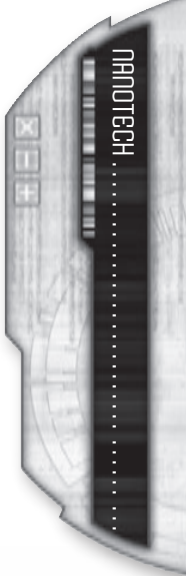
- Intelligence and black ops departments tend to be able to shell out for the really cool gadgets so expect altskin and nanopaste disguises to be standard issue for undercover ops.
- Fianchetto
- Intruder nanites that mechanically force computers to allow access and can subvert cyberware are also in high demand. Pueblo intelligence recently placed a big order with Evo—wonder what that's all about.
- Glitch
- On a recent visit to DeeCee, we walked into an FBI sting. The undercover G-man tried to use intruder nanites to disable my cyber. Too bad for him, I still had hunters in my system from an Evo extraction my crew pulled a month ago—but it was too close for comfort.
- Hard Exit

HUMAN AUGMENTATION AND MEDICINE

So what of the medical and para-medical fields? Well, the very first practical applications of nanotech were largely medical and the technology is integral to a great many developments in contemporary medicine. Functional and efficient “bladeless surgery,” deeper and more effective medical monitoring and reporting, rapid organ repair and healing of wounds, nanite sutures, oncological treatments, genetic splicing, pain-suspension systems, and coagulants represent only a fraction of the medical nanotech systems that are revolutionizing post-surgical and palliative operations as well as emergency/accident response treatments.

Nanotechnology is the silent wonder of the cybernetics and biotech industries, and has long been a staple of surgical installation and implantation procedures. Nanotechnology is an absolute necessity for all implant surgery, particularly for the installation of so-called “headware”—neuro-cybernetic interfaces—and pretty much any invasive augmentation be it cybernetic skill-wires and dermal plating or a biotech adrenal pump. Not only is nanotech used for implantation of stand-alone items of cyberware, but it is integral to the functioning of many others including cybereye accessories, filtration systems, chemical analysis tools, and even cyberlimb sensory feedback systems (various nano-sensors are laced into the outer “skin” of a cyberarm; microscopic pressure, heat, and cold sensors and monofilament-sized wires that detect cuts and abrasions and transmit “real” pain).

- Nanosensors of this sort have become standard in cyberlimbs in the last fifteen years. Only older models and second-hand 'ware tends to lack them. A lot of people tend to forget you can toggle them on and off at will—always a good call if you're thinking of punching through a door.
- Butch



Besides its role as an enabling technology for bioware, cyberware, and genetic therapies, nanotech augmentations are a blooming field. Most megacorps devote at least some resources to nanotech augmentation. Foremost among these are Shiawase, Evo, NeoNET, and Renraku, but others trail close behind.

Shiawase Biotech's specialty is medical nanotechnology. Most of this research concentrates on externally administered treatment, but it maintains a strong interest in nanotech treatments and implants. While less diverse than NeoNET in terms of nanoaugmentations, Shiawase's pioneering trauma control systems set the market standard, and it is the world's leading manufacturer of internal health management and surgical nanotech systems. NeoNET, meanwhile, is the industry leader in neural nanosystems, thanks primarily to their Transys Neuronet subsidiary.

Evo and Renraku, on the other hand, vie for dominance in metahuman enhancement nanoware, prophylactic applications, and nanocybernetics, while remaining heavily invested in other areas. Evo's products tend to represent innovative and elegant solutions in all these fields, marketing a multitude of products under a variety of renowned brand names. Most of Renraku's offerings are not particularly innovative or high quality, but they're cheaper and better distributed. Renraku's research divisions excel at taking pilfered technology, tweaking it and selling it as their latest innovation to governments and other elite groups competitors might not have access to—I should know, my company has been targeted more than once. Both Evo and Renraku are also deeply involved in the field of nanoneurological research.

Bringing up the rear in the arena of nanoaugmentation are Mitsuhama, Saeder-Krupp, and AA-Eurocorp Zeta-ImpChem, with each focusing on different specialties ranging from muscular reconstruction to cognitive enhancements.

- Rumor has it that Renraku still hasn't milked all the secrets from the innovations they salvaged from the Seattle Arcology. All indications are that their new neural-augmenters come straight from Deus's labs. Worrisome, now that we know there are more AIs out there on the Matrix.
- Puck

Nanoneurology

Nanites are capable of creating very small, complex structures. They build the artificial neurons that are essential to modern cyberware. Theoretically, it should be possible to create artificial neurons for other purposes: intelligence enhancement, behavior modification, and tandem computation between natural and artificial neurons. Indeed, simsense, Matrix, and cyberware technologies have already proven the viability of these projects. The greatest potential wrought by nanoware lies in nanoneurology and cognitive augmentation. In this field, nanoaugmentation even outstrips biotech solutions, because the body (which already devotes about 20 percent of its energy to maintaining normal brains) can only support a limited amount of additional brain tissue—self-powered nanites and the extended neural pathways they build and maintain are less limited.

The first-generation of neural amplifiers—nanite-based systems that augment specific cognitive processes—have only just been released straight from corporate white labs. Modifications that enhance what cognitive science calls the “g-factor” (for general

intelligence) are in experimental stages and subject to incredible levels of security.

Saeder-Krupp, Evo, NeoNET, and dark-horse Horizon all have black departments developing this coveted technology. In fact, this late-comer to the nanotech revolution deserves special attention: Horizon is allegedly *very* interested in neurological nanotech. Supposedly they envision applications that will allow users to see, feel, and think specific things for recreational and advertisement purposes; systems that will build artificial memory structures and neurochemical cues directly into the brain. While this may seem like the stuff of science fiction, I have it on good authority that Horizon has secured critical information from pre-Euro War Russian research long thought lost.

- This sounds pretty inoffensive until you think about the amount of cultural influence the corp could bring to bear if they could unlock the neurons that choose what you buy—or who you vote for—and design apps that influence the decision.
- Plan 9
- In this case, your paranoia's obsolete. The technology *must* already exist (we have BTLs, simsense and all manner of brainwarping tech now), but it would be a major PR disaster to sneak it up on people. It's far more likely that they'll openly market “designer beliefs.” Spend your weekends raving Humanis drek! Even if you're an ork! The kids will eat it up.
- Snopes
- FYI, a technomancer contact I made earlier this year thought it would be a good idea to get one of these new neural amplifiers and learned the hard way they interfere with his virtuakinetik abilities. He gets blinding headaches when he tries to go full immersion, and the poor guy can't even take it to a doctor. Don't know if it's an isolated case, but I'm not getting amped up until I know more.
- Netcat
- Evo, NeoNET, and Saeder-Krupp all seem to have heard the same rumor Taniguchi has. They're climbing all over each other to get a line on what Horizon is up to, but no luck so far. A couple of B&E jobs for Horizon labs in Los Angeles hit Jackpoint's job bank just last week.
- The Smiling Bandit
- Speaking of the devil, a friend over in Portland tells me that Saeder-Krupp is also quietly researching a novel approach to the nanotech concept: “nanomagic.” Nanotechnology is a powerful idea—one that already walks the fuzzy borders of “pure science.” The hope is that as things break down on a sub-microscopic level, so might the dichotomy between magic and modern technology.
- Winterhawk
- The trouble with genius is that it doesn't guarantee morality. I'd say that this is a good cautionary note to end the file on.
- Plan 9
- Huh?
- Slamm-O!



NANOTECHNOLOGY RULES

Wireless broadband connectivity, direct neural interfaces, nano-lathing techniques, optical computer chips, bladeless surgery, and monofilament buckytubes are all revolutionary advances and all widespread technologies in the world of 2070—none of which would exist without nanotechnology. Yet this crucial scientific discipline has all too often been seen as a lesser sibling or overlooked as a specialization to sciences such as medicine, engineering, biology, chemistry, and physics. Despite this stigma, in the last two decades, nanotechnology has grown into its own right and advanced by leaps and bounds. Though the megacorps still jealously guard the most sophisticated, radical and profitable applications, nanotechnology has become a major force in the metahuman augmentation market and yet another cog in the machine of everyday life in the Sixth World.

Despite the strict controls imposed by the Corporate Court on the proliferation and development of certain fields of nanotech, there is no doubt that the technology would have gone even further, were it not for the dangerous reputation it has gained following the takeover of Renraku's Seattle Arcology by the AI Deus and the deployment of weaponized nanites by the doomsday cult Winternight during the global system failure of 2064. Nevertheless, some industrial and research applications have since fallen into the hands of enterprising independents. Pandora's box has been opened and only time will tell the ultimate consequences.



INSIDE THE NANOMACHINE

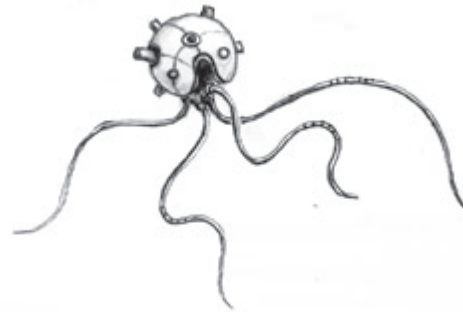
Nanotechnology is the science of constructing mechanical automata on a microscopic or cellular scale, though larger and smaller constructs are possible. While nanotech has long played a role in a variety of high-tech industries and lies behind some of the most ground-breaking technological innovations of the century, it all boils down to the smallest component: the nanite (also known as nanobots or nanodrones).

All nanites are designed to fulfill specific functions and perform specific tasks. Size varies depending on its specific purpose. Nanotech systems designed to operate in living bodies are known as *nanoware* and use roving colonies of thousands of nanites the size of a human blood cell—up to 10 micrometers in diameter—to operate internal changes, enhance bodily functions, and graft artificial structures at the neural level. Nanites used in other functions and environments, from heavy industry to commercial nanoforges, vary considerably in size and complexity, ranging from the molecular to almost visible to the naked eye.

Most common varieties of nanites are carbon-network based constructs (so-called “diamondoid” materials), and their assembly involves a series of sophisticated and complicated techniques—the primary reason self-replicating nanites are still the realm of fiction. Nonetheless, these *hard nanites* are capable of a dazzling variety of functions and are used in everything from space-based construction to cybernetic implantation to desk-top nanofaxes. Obviously, nanotech military and security applications are also vast, and one of the reasons the technology is still mistrusted.

Breakthroughs have also taken place in recent years in using protein-based nanotech to develop “soft machines” or bio-nanites. *Soft nanites* are vat-grown and genetically “programmed” microcellular organisms and bacteria that boast almost the same versatility as modern hard nanites and are even better adapted to organic environments. Circumventing the obstacles of designing bio-nanites based on complex protein and carbohydrate-structures from the ground up, nanoscientists have gene-tailored samples of existing cell and bacterial strains—neutered to reproduce only in specific lab-conditions—to perform nanite functions.

Both varieties of nanites (as well as any hybrids that might come along) are simple repetitive-task nanorobots hardwired to perform specific functions. Even the most complex nanites lack the memory capacity to carry heuristic expert systems or knowbots. Their self-preservation capacity is equally limited. Both these limitations can be partially overcome by implanting a cybernetic nanohive (see p. 112) to maintain, replenish, and coordinate multiple freefloating nanoware systems. Nanohives also provide for storage during periods of inactivity (protecting nanites from the hardships of natural metabolic processes). Nanites are capable of ultra short-range communication with one another, passing on simple directions or trigger commands via electrochemical or microwave signals.

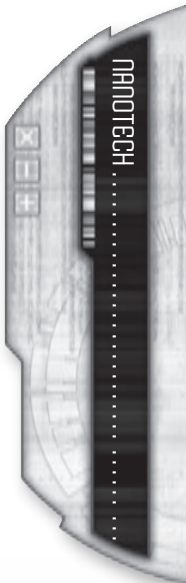


The Littlest Engine

Though the underlying technologies are virtually identical, the following rules distinguish between *implanted nanotech* (hard or soft machines) that can be implanted or injected into a living body and *nanogear* that use nanites designed to function outside the body and is used on anything from mining and manufacturing applications to molecular reconstruction.

Implanted nanotech in turn falls into two different categories: *nanoware* (p. 107) includes implanted nanite colonies that are either free-floating systems or build and maintain micro-scale enhancements in a metahuman body or other biological entity; *nanocybernetics* are actually pieces of cyberware that interact with, depend on, or complement nanoware systems. All bonuses from nanoware or nanocybernetics are limited by a character's relevant maximum augmented ratings.

Nanogear and Equipment (p. 113) addresses some of the miscellaneous tools, gear, and industrial systems that use nanites (typically using hard nanites) in their various functions.





INCOMING FEED.....

Nanotech Detection

Nanoware is very difficult to detect. A millimeter wave detector or cyberware scanner can be used to detect nanocybernetics (just like any other cyberware), but a nano-scanner is required to confirm the presence of nanoware. The latter is standard gear in hospitals and clinics, but uncommon on the streets. The threshold for detecting nanoware can be found on the *Nanotech Detection Table*. A test must be made for each system.

SOFT AND HARD MACHINES

For the most part, soft and hard nanites are interchangeable in game terms. While hard nanites are the choice for most

industrial and manufacturing application nanotech, in the field of personal enhancement both are quite common. In fact, many augmentations use either one or the other, contingent only on the design chosen at the development stage by the manufacturer. Some augmentations even combine both.

Generally speaking, soft nanites are better choices for free-floating nanite systems that complement or supplement metabolic processes and biotech enhancements, while hard nanites are better to complement cyberware, perform surgical functions, and tasks which require cooperation of various “sub-breeds” orchestrated by nanohive implants (see *Nanohive*, p. 112). There are, however, other mechanical differences between the two.

Soft nanites are partly artificial or genetically modified micro-organisms programmed to perform a certain task. Genetic tweaking provides them with the manipulators and internal systems needed to perform their designated functions. They are powered by natural organic processes and function much like bacteria or virii, and for the most part appear just like their natural counterparts making them much harder to detect.

Hard machines are artificial constructs, nano-scale drones made from diamondoid composites, with almost frictionless bodies and internal power supplies. Normally, hard nanite programming is hardwired, but since their action is often coordinated by a nanohive, they are designed so programming can be modified slightly via the hive’s control expert system. This means hard nanites may be reprogrammed (see *Reprogramming Hard Nanites*, below).

NANOTECH DETECTION TABLE

Type of Nanoware	Detection Threshold
Nanocybernetics	
Standard	2
Alphaware	3
Betaware	4
Deltaware	5
Nanoware	
Hard Nanites	2
Soft Nanites	4



Detecting Soft Nanites

Soft nanites are designed to be indistinguishable from normal cells to the body's own immune system. This involves not only protein-matching, but applying similar appearance and functions to otherwise normal cells and sympathetic bacteria. This makes soft machines harder to detect than hard nanites to all but the most sophisticated and detailed medical exams. The Threshold to detect soft nanites via nano-scanner or clinical tests is increased by +2 (see *Nanoscanner*, p. 114).

Reprogramming Hard Nanites

One of the advantages offered only by hard nanites, and one reason for their continued preference in manufacturing fields, is the ability to partially reprogram hard nanite systems to operate outside their design function at lower efficiency.

Nanite colonies in industrial applications (such as nanoforges, polymer vats, recycling plants, etc) are invariably coordinated by a dedicated nanohive processor and integral expert system—typically built into the sealed vat/environmental chamber containing the colony. In the case of hard nanoware systems, such a control processor is part of the optional nanohive cyberimplant. Short-range directed ultra-sound, microwave, or UV—as defined by the design of the original nanite—is used as a carrier signal for reprogramming instructions tuned to each specific colony.

Current nanohive and nanite systems do not allow nanites to be rigged, and the only way a hacker or rigger would be able to control nanites—either individually or as a colony—is by reprogramming them as noted below.

Reprogramming itself requires the hard nanites suspend whatever operation they were performing and withdraw to the nanohive. A successful Engineering (Nanorobotics) (24, 1 hour) Extended Test is required. Glitches produce complications (such as rating fluctuations or unforeseen side-effects), and critical glitches can result in the loss of the nanite system or even it turning on the user or otherwise drastically failing.

Reprogramming allows a specific “breed” or system to perform as if it were another system at a diminished rating. The decrease in rating may vary from -2 to -4 depending on the gamemaster's perception of similarity between system functions. For instance, reprogramming Oxyrush nanoware to perform as Carcerand Plus might only induce a -2 reduction since both systems are designed to transport and deliver internal payloads which can be replenished at a nanohive. Reprogramming Oxyrush “porter” nanites to perform as a Cutter colony and damage its host would likely produce a -4 rating reduction.

ESSENCE COSTS

Nanoware does not carry an Essence cost nor does it currently come in grades. Nanocybernetic augmentations, however, as specialized cybernetics, do carry an Essence cost. All nanocybernetics count towards the cyberware total (p. 301, *SR4*) when calculating Essence loss.



Grades

Like cyberware and bioware, nanocybernetic implants come in four grades that determine their quality, invasiveness and modify their final prices: basic, alphaware, betaware, and deltaware. Use the Essence Cost Multipliers and Cost Multipliers on p. 303, *SR4*.

USING NANOWARE

While nanotech sees myriad applications, *nanoware* is the term for nanotech implanted in living organisms as a form of enhancement. What sets nanoware apart from other forms of enhancement is the role of nanotech itself. The most common type of nanoware consists of free-floating nanite colonies designed to supplement or replace a body's physiological systems or to enhance metabolic processes or act as a prophylactic measure. To this end, nanoware circulates via the blood, lymph, and extra-cellular fluids to reach all parts of the body. Other types of nanoware install themselves in the vicinity of a particular organ to either enhance organ functions or to build and maintain ultra-fine nanostructures. Various types of neural nanoware, filtration systems, and organ enhancements fall into this category, and what distinguishes them from cyberware is the need for active nanite colonies. For rules on nanoware implantation, refer to p. 129.

Nanoware uses either hard machines delivered using an aerosol or injection or soft machines delivered via injection or ingestion vectors to make precise adjustments to biological systems. Some nanoware systems are available in soft or hard machine versions depending on the corporation manufacturing the specific augmentation. Nanoware systems are considered to be always active, unless a nanohive implant is present. Amongst other functions, nanohives allow for controlled activation of nanoware systems or colonies, recovering them, and storing them during “downtime.”

Another defining aspect of nanoware is that it's not usually permanent. Despite modern techniques that provide nanites with protein-matched immune markers to stave off the worst, a living body is still an incredibly hostile environment, and sooner or later nanites are flushed or absorbed by the system.

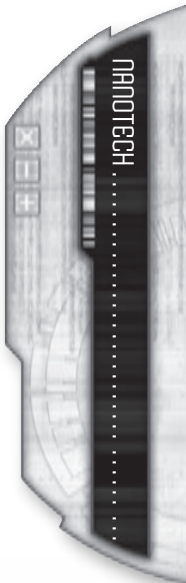
Note that nanites that monitor the flesh/cyber interface are considered either nanocybernetics or part of the cyberware implant itself and do not fall under the nanoware classification.

Nanoware Ratings and Degradation

All nanoware has a Rating which represents that specific nanite colony's hardiness, versatility, and its level of performance—whether it is used in “bladeless surgery,” cyberware implantation, antidote treatment, or as a form of enhancement or stimulant. Though more robust than previous generations, current nanoware systems are still transient in nature, meaning they are purged in due course by the body's filtration, digestive, and immune processes.

To represent this transient nature, the Ratings of nanoware systems permanently degrade over time, typically at the rate of 1 rating point per week. A functioning nanohive (see p. 112) counters this nanite loss by providing a safe environment for replenishing feedstocks and colony numbers—regardless of whether the system involves hard or soft machines. Nanoware supported by a nanohive does not degrade in this manner. The number of nanoware systems a nanohive can support is equal to its rating.

Active nanoware in the organism also suffers degradation when the body takes serious wounds—bleeding out or straying



into contact with foreign bodies or physiological systems that they aren't designed to tolerate. For every 3 boxes of Physical damage taken by the host, reduce the rating of any active nanoware systems by 1. A functional nanohive will repair and restore nanoware lost in this manner (and only in this manner) to its current rating at a rate of 1 point per week. Without a nanohive's support, the nanoware's rating is permanently reduced.

Triggering and Shutting Down Nanoware

Unlike cyberware, nanoware isn't normally controlled through direct neural or wireless interfaces. Some nanoware colonies are permanently active. Others are controlled indirectly through a nanohive. Many, however, are preprogrammed to respond to certain stimuli (turning on or off, as the case may be). They may be coded to react to a predetermined condition or physical trigger, to contact with a certain chemical, to a localized electric pulse or an encrypted microwave signal, or simply the absence of one. The actual stimulus varies considerably, but is usually something almost instantaneous. It is largely irrelevant to game mechanics and, if relevant, the gamemaster and player should define the stimuli for any nanoware before play. Nanoware system descriptions below suggest typical trigger conditions.

Obviously, someone forcefully implanted with nanoware for whatever nefarious end may not know what the trigger conditions are and will be unable to find out without a careful microscopic examination of a sample of the nanite breed. This requires an Engineering (Nanotech) (12, 1 day) Extended Test and a microelectronics shop.

Deactivated nanites are said to be "dormant." Dormant systems still suffer degradation but also still benefit from the presence of a nanohive.

NANOWARE SYSTEMS

The following is a sample of the most common and best known nanoware systems on the market.

Anti-Rad

Popular among spacejacks and workers in high-ambient radiation environments such as the SOX, anti-rad nanoware is a new development and quite expensive. This freefloating system scours the body via the lymphatic system for tell-tale isotope traces, free radicals, and radiation damaged cells. Anti-rad nanites bind the contaminants in a solvent cage. In the case of cells, anti-rad nanites inject damaged or mutated cells with a compound that induces cyto-death, reigning in further division and mutation. The anti-rad nanites then attach to the waste and transport it to the nearest lymph node to be processed and evacuated normally. Anti-rad nanoware reduces the Power of radiation damage by its rating. Anti-rad is intended as a prophylactic measure, and is unable to eliminate metastasized cancers or pre-existing cell mutations.

Carcerand-plus

Carcerand-plus is the nanotech version of carcerands, hollow molecular spheres designed to carry a drug payload that they slowly dispense as they circulate the body and break down over time. Normal carcerands



are passive, designed to break down within a narrow period. Carcerand-plus can be programmed to respond to external stimuli such as the presence of a certain molecule, a sonic or electrical pulse, or a wireless signal from a PAN relayed by a nanohive. Once triggered, carcerand-plus nanites release their payload into the bloodstream. Carcerand-plus nanoware contains the equivalent of one dose of a compound per rating point. Once injected, carcerand-plus colonies circulate through the body until the trigger condition is met or they are purged. The trigger condition must be specified before the nanites are installed. The requisite dose of compound must be bought and paid for separately.

Control Rig Booster

This specialized breed of neural amplifier nanites (see p. 109) are designed to complement implanted control rigs (p. 331, *SR4*). The nanites organize themselves into artificial neural pathways, building and maintain a network of nanofilaments. This extends the normal interface between the control rig and the middle brain to parts of the dorsolateral prefrontal cortex, cerebellum, and thalamus—areas of the brain that manage subconscious movement, sensory interpretation, and instinctive decision-making. The booster colony's dedicated neural pathways allow a rigger to make greater use of the brain's intuitive understanding of spatial positioning and capacity for instinctive motion control when jumped in to a virtual body (be it a vehicle or drone). The control rig itself translates the resulting neural impulses into rigging data like speed control, inertia handling, etc.

In game terms, the booster applies a +1 bonus per rating point to the character's Piloting skill (up to the skill's augmented maximum of natural skill x 1.5) when he has "jumped into" a drone or vehicle via virtual reality. This bonus only applies if the character already possesses control rig cyberware (p. 331, *SR4*). The new nanopathways created by the booster are incompatible with simsense booster implants (p. 37).

Implant Medics

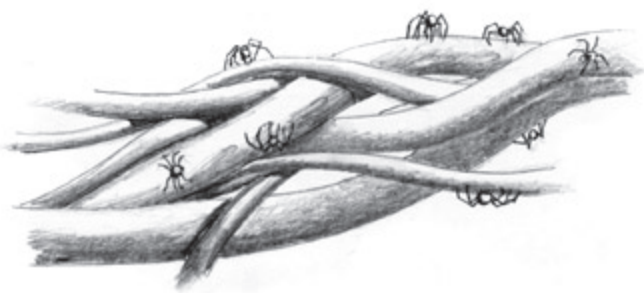
This nanoware system is installed along with a specific bio-ware or cyberware implant. The free-floating nanites in this system are designed to monitor the health and well-being of that implant, and to immediately act to repair it if any malfunction or damage occurs. If the nanites detect a problem, they will work to restore the implant to its standard operating parameters by rejoining neural connections, seal fractures, repairing circuitry, stabilizing chemical levels, removing damaged tissue, and so on.

In game terms, an implant medic system will automatically seek to heal/repair a damaged implant. If the implant was targeted with a called shot, the implant medic's rating adds to the dice pool for any healing tests to fix that damage. If the implant was damaged by other means, use the implant medic rating to make a surgical test as described under *Installing/Repairing Cyberware and Bioware*, p. 126 (note that this "surgery" does not inflict surgical damage).

Nantidotes

Nantidotes can be soft or hard machines depending on the system's manufacturer. Nantidotes are hollow nanites that float in the user's bloodstream and carry a specific toxin's antidote inside an outer membrane. When a nanite comes into contact with the





predefined toxin or compound, this outer membrane automatically dissolves or cycles open, administering the antidote at the poisoned site.

Normal nantidotes affect only one type of toxin or venom, chosen when the nanites are created/programmed. If the nantidotes are already present in the body, their effect is instantaneous—they provide complete immunity, and the toxin has no effect. If they are administered after the toxin is applied, they take 1 Combat Turn to take effect, and will only affect the toxin's impact if they kick in before the toxin's effects do (though at the gamemaster's discretion, nantidotes applied after the poisoning may diminish a toxin's other effects, such as nausea). Each nullified toxin dose reduces the nantidote's rating by 1 point; if the rating is reduced to 0, the nantidotes can offer no more protection. This rating degradation may be restored by a nanohive at the standard rate of 1 point per week.

Universal Nantidotes: These nantidotes are designed to counter a broad spectrum of toxins, rather than one specific compound. They carry active charcoal, tannic acid, magnesium and other chemicals to absorb toxins from the digestive tract and bloodstream, and also enhance the body's natural detoxification processes. Unlike regular nantidotes, universal nantidotes do not provide automatic immunity to a toxin. Instead, reduce the Power of that toxin by the nanoware's rating. If the toxin's Power is reduced below 1, further effects/damage are halted. At the gamemaster's discretion, certain exotic toxins may not be impeded by universal nantidotes, particularly neurotoxins. Universal nantidotes will also protect against the effects of alcohol, nicotine, and caffeine. Universal nantidotes degrade in the same manner as regular nantidotes.

Nanite Hunters

Nanite hunters (often called "blue goo") seek out and destroy other active nanites. Depending on the version chosen, nanite hunters either target specific nanoware colonies or all nanoware systems within a host body unauthorized by the user. Hunter nanites are unable to breach a nanohive to attack dormant nanite systems.

To determine whether nanite hunters destroy a targeted nanotech system, make an Opposed Test every Combat Turn pitting the rating of the nanite hunter nanoware against the rating of the targeted nanoware system. Nanite hunters find it harder to identify soft machines in physiological systems, and so incur a -2 dice pool modifier against soft nanite systems. Each net hit reduces the rating of the losing nanoware system. When one system's rating is reduced to 0, that nanoware system is destroyed.

If the universal version is used and more than one unauthorized nanoware system is present in the host body, the gamemaster chooses which is attacked first. Hunters will continue to attack until their rating is depleted to 0.

Nanite hunters can be set to active or passive modes. In active mode, nanite hunters attack all unrecognized nanosystems. In passive mode, nanite hunters do not act until commanded to do so. After introduction, a user may only change modes or add nanoware permissions if he possesses a nanohive to relay orders from his PAN.

Single System: These nanite hunters only attack one type of nanoware.

Universal: Universal nanite hunters attack all unauthorized nanoware.

Nanosymbiotes

Nanosymbiotes are hybrid colonies of specialized nanites that permeate the user's anatomy. Once they have fully deployed, they adopt specialized functions appropriate to their location. These are all focused on returning the subject to a healthy physiological baseline. Nanosymbiotes adjust body chemistry, assist cell formation, and even mimic certain cell functions themselves, acting to speed clotting and healing.

Functioning nanosymbiotes allows the user to heal and recover from wounds faster. Characters add the nanosymbiotes' rating to their dice pools for natural healing tests (p. 242, *SR4*).

Nanotattoos

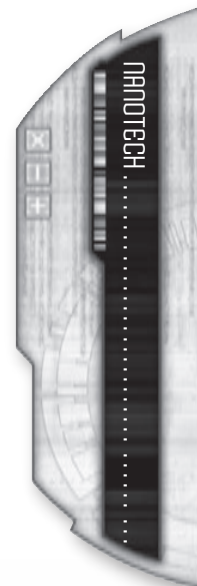
Once injected, nanotattoo hard machines imbed themselves as a lattice of liquid crystal microdisplays under the subject's skin. A single nanotattoo covers one limb, the torso, or the face. PAN commands program the nanotattoo to display any image the user wishes, including preprogrammed animation.

Nanotattoos can provide effective camouflage, provided the user wears minimal clothing (and a full body treatment) or a camouflage outfit (and a treatment for the face and exposed extremities). When used on its own, this provides the same -2 Perception Test modifier as camouflage (pp. 315-316, *SR4*). When used with camouflage clothing, it provides an additional -1 Perception Test modifier. A Rating 1 nanotattoo is enough for decorative purposes, but higher ratings provide greater color and variety. Nanotattoos can change as fast as the user can find a new design and transmit it through their PAN.

Neural Amplifiers

This form of neural nanoware has been in development since the very first days of the datajack. Nanotechnology has finally developed to the point where scientists can foray deeper into the brain and central nervous system without excessive risks. Neural amplifiers use soft nanites to manufacture artificial neurons and expand neural pathways between specific parts of the brain's or body's neural network. After growing the expanded neural architecture, the dedicated nanite colony falls into a support role, electrochemically stimulating the newly-formed pathways—a process which emulates natural reinforcement of neural pathways in the brain through learning, practice, and experience.

Each type of neural amplifier targets specific neuron tracts, enhances glial cell functions (in the brain), and increases axon



density and width with superconductive nanofilaments sheathed with nu-myelin (a transgenic protein which reduces interference with neural impulses and neurotransmitter “signal degradation”). Neural amplifiers create a significant increase in specific brain functions and response time. Only two neural amplifiers are possible per subject, after which point the additional neural traffic becomes increasingly distracting and confusing (apply a -2 distraction modifier to all actions per additional neural amplifier).

Learning Stimulus (LS): These neural amplifiers facilitate comprehension and memorization of skills the character already possesses by enhancing the brain’s ability to cross-reference learned skill memories and the language comprehension functions of the parietal-temporal-occipital complex. When raising a Knowledge or Language skill the character *already possesses*, LS nanoware reduces the Karma cost by 1 for each rating point.

Limbic: Limbic neural amplifiers rewire parts of the limbic system to areas of the parietal, temporal, and occipital lobes that produce cohesive sensory perceptions (from neural sensory stimuli). This implant increases the user’s dice pool when using Intuition-linked skills by +1 per rating point—as long as the character is able to focus without significant diversions.

Neocortical: Neocortical neural amplifiers enhance frontal lobe activity, which is essential to a metahuman’s abstract thought processes and problem-solving ability. When using Logic-connected skills, this implant increases the user’s dice pool by +1 per rating point—as long as the character is able to concentrate on the problem at hand without major distractions or encroaching stressful situations (such as a raging firefight, an ongoing chase, or hacking an ultra-secure system).



Recall: Recall neural amplifiers enhance sensory memory storage and recall by ensuring neural pathways to stored memories are reinforced and do not fall into disuse. Recall adds dice equal to its rating to any Memory Tests (p. 130, *SR4*) to remember facts, events, or other information the character has directly experienced and concentrated on memorizing.

O-Cells

O-cells or Omega cells function as enhanced lymphocytes (white blood cells) integrated into the body’s auto-immune system. O-cells are gene-modified and augmented from T- and B- cells, which are part of the body’s adaptive immune system. These natural cell types retain a record of previous infections so that they can mount a quicker and stronger response to the



Nanoware	Type	Availability	Cost
Anti-Rad (Rating 1–6)	Hard	10	Rating x 1,500¥
Carcerand Plus (Rating 1–6)	Soft/Hard	6	Rating x 2,500¥ (+drug)
Control Rig Booster (Rating 1–3)	Hard	8	Rating x 5,000¥
Implant Medics (rating 1–6)	Soft/Hard	6	5% of implant cost
Nantidotes (Rating 1–6)	Hard/Soft	8	Rating x 1,000¥
Universal Nantidotes (Rating 1–9)	Hard/Soft	12	Rating x 2,500¥
Nanite Hunters			
Single System (Rating 1–6)	Hard	10R	Rating x 1,000¥
Universal (Rating 1–6)	Hard	16R	Rating x 2,500¥
Nanosymbiotes (Rating 1–3)	Soft	12	Rating x 5,000¥
Nanotattoos (Rating 1–3)	Hard	8	Rating x 250¥ (per area)
Neural amplifiers			
Learning Stimulus (Rating 1–3)	Soft	8	Rating x 4,000¥
Limbic (Rating 1–3)	Soft	10	Rating x 5,000¥
Neocortical (Rating 1–3)	Soft	10	Rating x 5,000¥
Recall (Rating 1–3)	Soft	6	Rating x 2,500¥
O-Cells (Rating 1–9)	Soft	8	Rating x 2,500¥
Oxyrush (Rating 1–5)	Hard/Soft	8	Rating x 1,000¥
Trauma Control System (Rating 1–6)	Hard	8	Rating x 2,000¥



culprit antigen(s) or pathogen in cases of re-infection. Unlike natural lymphocytes, which only store memories of previous infections (or inoculations), O-cell soft nanites come equipped with broad-spectrum pharmacological microdoses and an inbuilt “library” of responses to a wide array of common pathogens. O-cell nanoware reduces the Power of any viral or bacterial pathogens that infect the host by its rating and is often used as against bioweapons and diseases.

Oxyrush

Oxyrush nanites store blood oxygen in diamondoid bottles, then release it to maintain healthy blood-oxygen levels. A character with this nanoware can hold his breath for a half hour for every rating point. Additionally, oxyrush also adds its rating to the character’s dice pool on any Fatigue Tests.

Taggants

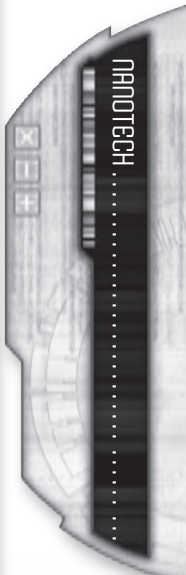
Taggant nanites are typically used to either temporarily mark targets so that they can be detected by informed searchers at a later time or as a discreet message delivery system. Taggants may carry information as simple as the time, place, and reason the person was marked to heavily-compressed documents in nano-optical chips. Taggants are sometimes injected into intruders by automated security systems, so they may be identified/located later.

Markers: These taggant nanites are sealed microscopic optical chips used for transporting valuable data undetected. Data is typically divided up and downloaded into multiple soft nanites—figuring in redundancy and nanite loss. Later, a simple blood sample is all that is needed to collect enough datacapsules to reconstitute the data within. Markers are designed to defeat nanoscanners, unless the searcher specifically knows what he is looking for; reduce the nanoscanner’s dice pool by the marker’s rating for the detection test.

RFID Markers: RFID nanocapsules emit a (sometimes encrypted) signal that carries the taggant’s information and that can be detected by a standard wireless device. These signals usually advertise the subject’s criminal convictions or legal status, but have been known to include political propaganda or advertisements. RFID markers are active upon injection. They have a Signal rating equal to their nanoware rating.

Trauma Control System (TCS)

An ancillary nanoware system to the nano-bimonitor (p. 112), the trauma control system (TCS) consists of a combination of various hard machine breeds that treat shock and trauma symptoms. The presence of a nano-bimonitor is a requisite, since it diagnostic processor directs the TCS nanoware. Some component nanites apply electro-stimulation to the heart and respiratory muscles, while others regulate blood flow away from wounds without starving the brain of oxygen. If no other character is there to stabilize the host, use the nanoware’s rating as the dice pool in a Stabilization Test (p. 244, *SR4*). If an ally is also attempting to stabilize the user, use the best roll of the two to determine whether or not he has been stabilized. The implant may continue to roll its dice pool every Combat Turn, at the usual cumulative –2 dice pool penalty for successive attempts.



NANOCYBERNETICS

Nanocybernetics bridge the gap between nanoware systems and ordinary cybernetics. What makes them unique and different from standard cyberware augmentation is that working nanocolonies are an integral, and in fact essential, part of the implant. Nanocybernetics can and do perform a wide variety of functions. Some, such as the nanohive, are necessary for free-floating nanites to exist within a metahuman body. Others, such as the nano-biomonitors, use nanites as ultrafine sensors to monitor the body's health.

Unlike nanoware, all nanocybernetics are permanent and non-degrading implants despite using active nanite colonies. The implant itself normally contains feedstocks and limited storage during downtimes. All are considered cyberware (see p. 330, *SR4*) and follow the basic cyberware rules. All have an Essence cost and are available in all standard cyberware grades.

Some nanocybernetics can be installed within cyberlimbs; these have the ECU and other costs listed in their descriptions.

Dynamic Handprints

This nanite system alters the ridges and lines of a user's fingerprints and palms to match PAN-transmitted schematics. Various imaging devices can scan finger and palm print samples for the implant to replicate. When dynamic handprints are used to defeat a print scanner, make an Opposed Test between the implant's rating and the scanner's rating (see p. 255, *SR4*). Like other counter-biometric nanocybernetics, this system includes a specialized nanohive, processor, and a small nanite colony.

Flashback System

An advanced form of the old invoked memory stimulator cyberware, this system features a micro-memory module, a processor, and a dedicated nanohive supporting a specialized neural amplifier colony. Flashback nanites organize themselves into a network of sensors and nanofilaments—similar in many respects to a trode net—over the surface of the user's brain. These probe nanites register neural activity associated with memory formation, backing up the patterns to digital memory (these patterns may also be saved elsewhere via the user's PAN). If the subject suffers a brain injury or even simple forgetfulness, the system can access these neural records and stimulate the same neural activity, prompting recall.

In game terms, the character receives the Photographic Memory quality (p. 80, *SR4*) regarding any experience within the flashback system's storage duration. These memories are so vivid that it is the equivalent of the character reviewing a simsense recording of the experience. Note that the system does not actually store memories in backup memory, just the neural activity map. This means memories may be affected by drugs that inhibit or cause loss of memory. Obviously, someone else downloading the playback record on their own flashback system will not evoke the same memories, as their neural structure is different.

Nano-Biomonitor

This implant is an upgrade of the basic cybernetic version of the biomonitor (p. 39), enhancing it with free-floating nanite systems. The implant's diagnosis processor is wirelessly enabled (and may be encrypted) and transmits to a PAN or specific display device. This nanite-based version is generally more effective

than the basic model, as it also analyzes body chemistry, hormone levels, and operates on a finer scale. Like a basic biomonitor, it is programmed with the range of normal values for the user, considering age, sex, and metatype. If the sensor results exceed the pre-programmed tolerances, the unit automatically triggers a warning display—and can be programmed to send an emergency call via a PAN-connection.

Nanohive

A nanohive is a nanocybernetic implant designed to support and coordinate nanoware in a living body long-term. Nanohives not only contain the hardware and software necessary to aid the functions of multiple nanoware colonies, but they also provide a safe environment for nanoware systems to repair, replicate, and resupply. As part of nanohive implantation procedures, a host of other minor cybernetic modifications are made to pre-existing organs including the liver, kidneys, and spleen. These alterations keep the body from filtering out nanites like other waste and cellular "detritus." Nanohives themselves replace and repair nanites that are excreted or damaged by the body, maintaining nanite populations at a normal level and even restoring depleted levels after injury (see *Nanoware Ratings and Degradation*, p. 107). Combined with the filtration systems and the robustness of current nanotech, this limits natural nanite loss.

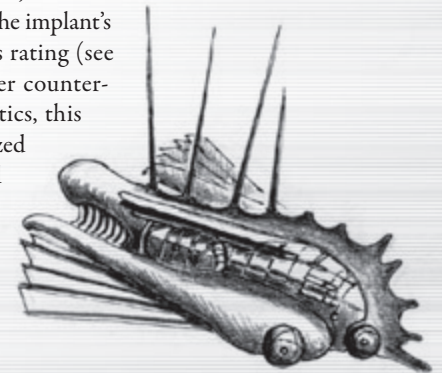
Each nanohive is a sealed egg-shaped implant containing the primary processor, controllers, and neural interfaces and is implanted near arterial or lymphatic junctions. In addition to the expert system(s), a nanohive incorporates sensors that monitor nanite levels in the blood, as well as reservoirs of feedstocks in gel form. Feedstocks, support machinery for additional nanite colonies, and several thousand backup nanite units are present in ancillary pods. Each nanohive is individually numbered and has an encrypted RFID tag.

Nanohives are also able to communicate and direct the actions of nanoware via short-range ultrasound, microwave, or UV signals using the nanites themselves as relays. In the case of hard machine nanoware, nanohives are also able to relay schematics or reprogramming instructions from PANs.

A nanohive's rating indicates the maximum number of nanoware systems it can harbor and sustain. Nanohives must be restocked every six months at a cost of 500¥ x Rating.

Retinal Adjusters

This nanite implant reworks the vein and tissue patterns in the user's retinas to match PAN-transmitted designs. When used to defeat a retinal scanner, make an Opposed Test between the implant's rating and the scanner's rating (see p. 255, *SR4*). Like other counter-biometric nanocybernetics, this system includes a specialized nanohive, processor, and a small nanite colony. Adjusters are not compatible with cybereyes or other retinal duplication systems.



Smart Skin

This treatment laces the user's epidermis with smart polymers and carbon buckytubes, manipulated by an implanted microprocessor and support nanite colony. The smart skin retains the texture and flexibility of normal skin until activated, at which point the material becomes rigid enough to protect the wearer (though still flexible enough at the joints not to impede movement). While active, smart skin is as obvious as dermal plating—and like it, provides its rating in Ballistic and Impact armor. Activation is painful as well; the user automatically suffers 1S damage every time it hardens.

A secondary smart skin setting changes the smart materials into microspines. These do 3S damage to anyone brushing at speed or hitting the user barehanded. Smart skin is incompatible with all other forms of dermal armor or sheathing (be they bio- or cyberware, including orthoskin), but is cumulative with normal body armor.

Voice Mimic

A nanite colony in the character's larynx adjusts the user's voice to match PAN-transmitted instructions. Sound files can be used as templates. When a voice mimic system is used to defeat a voice recognition scanner, make an Opposed Test between the implant's rating and the scanner's rating (see p. 256, SR4). Like other counter-biometric nanocybernetics, this system includes a specialized nanohive, processor, and a small nanite colony.

NANOGEAR AND EQUIPMENT

Personal nanotechnology is still a distant reality, but numerous commercial applications are beginning to trickle down to the masses and the shadows. Typically, nanotech that comes in doses or applications is available in gel suspension or aerosol in 1-liter airtight containers.

Altskin

The altskin concept is simple and expands on the same basic technology in nanopaste disguises (p. 330, SR4): a layer of nanites responsive to the wearer's natural skin and body contours can contain other useful properties. Altskin is one of the ultimate forms of non-surgical body modification, making it useful for actors, clubgoers, and thieves alike.

Virtually indistinguishable from natural skin, basic altskin (which may be bought in all but the most exotic skin tones) is painted on in several layers. An arm, leg, face, or torso each takes one application and ten minutes to cover. It then takes another 10 minutes to "dry," during which its nanite sensors form connections with the user's natural epidermis. A single application lasts for 24 hours, after which it begins to flake off. An adhesive wireless transmitter (typically in the form of a 1-inch disc) automatically connects to the user's PAN, uploading the altskin's simple command software. This allows the user to issue commands to the altskin via a commlink or other appropriate device.

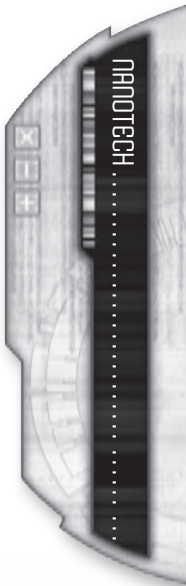
Basic altskin passes on two major benefits: it provides the user with the functional equivalent of a skinlink (p. 318, SR4) for the duration of an application, and it also automatically filters out harmful contact chemicals. It is safe to touch a contact-vector toxin with an altskin-covered appendage. Against an area threat, such as a poisonous cloud, the total number of applications worn is the protective device rating against contact toxins (see *Toxin Resistance Test*, p. 245, SR4). Note that an altskin-covered appendage does not leave fingerprints (nor can the user's natural finger or palm prints be used for biometrics).

Altskin may also be bought with one or more embedded functions. The following are hardware upgrades and cannot be changed on the fly:

Armor: The armor upgrade adds tough carbon nanotube fibers to the altskin. These provide little protection against blunt force trauma, but do guard against penetrating blows. The amount of protection provided depends on how much body surface the altskin covers as noted below:

Nanocybernetics	Essence	Capacity	Availability	Cost
Dynamic Handprints	0.2	—	12F	Rating x 1,000¥
Flashback System	0.3	—	8	5,000¥
Nano-Biomonitor	0.3	—	8	10,000¥
Nanohive (Rating 1–6)	0.5 + (Rating x 0.25)	[2]	Rating x 5	Rating x 10,000¥
Retinal Adjusters	0.2	—	16F	Rating x 5,000¥
Smart Skin (Rating 1–3)	0.5 x Rating	—	(Rating x5)	Rating x 10,000¥
Voice Mimic	0.2	—	16F	Rating x 3,000¥

Nanotech	Type	Availability	Cost
Altskin (per application)	Soft/Hard	12	1,500¥
Armor		+4R	+500¥
Newprint		+4F	+(Rating x 200¥)
Sealer		—	+250¥
Shade		—	+200¥
Shifter		+4	+300¥



- Torso only: 1/0
- Torso and two limbs or torso and head: 2/0
- Full coverage: 3/1

Newprint: This upgrade allows the user to reprogram his finger or palm prints, just like dynamic handprint nanocybernetics (p. 112).

Sealant: The sealant upgrade repairs its own tears and punctures. Since it perfectly follows body contours, it also serves as an effective pressure dressing. This adds +2 to the dice pools of characters attempting to stabilize the wearer, but subtracts 2 dice from Medicine dice pools to treat the character until it is removed. Sealer prevents blood loss, but also complicates surgery and drug injections.

Shade: This upgrade, often purchased along with the shifter function (see below), allows programmable skin color. This coloration can be natural or unnatural. Users can use a PAN-connected device to command the altskin to display different shades, shifting designs, and even animated images with equal ease. Shade altskin can distort the user's outline and help her blend in with her surroundings, providing the same benefits as a camouflage suit (pp. 315-316, *SR4*), except that it can be adjusted for the surrounding environment.

Shifter: The shifter upgrade cannot cause gross changes in body shape, but can alter facial features and skin textures. Clubgoers and artists sometimes use this to give themselves a scaly or "engraved" surface texture, but runners find it to be a useful form of disguise. Users can change a shifter configuration through the wireless or PAN-device of their choice, but the altskin takes 10 minutes to take on the requested configuration. If the altskin is also the correct shade, it can provide a disguise more sophisticated than that granted by a simple computer-designed latex mask. Use the same rules for the latex mask (p. 330, *SR4*), except that the user can change designs on the fly and gains an additional 2 dice to Disguise Test dice pools. On the hands and feet, shifter altskin can also assist climbing (add 1 die to the dice pool) by taking on a rough and rubbery texture.

Demolishers

Demolishers are a hard machine system devised to slowly disassemble most forms of solid matter. Originally designed to replace conventional demolitions, these nanites break down materials into piles of recyclable components (normally in powder form). Demolishers are slow, but effective. A single dose, sprayed or painted on, can turn more than half a metric ton of solid matter into dust. The first kilogram dissolves in an hour; the rate then doubles every hour until 6 hours have passed, at which point it stabilizes until the nanites have exhausted their internal power supply (12 hours after deployment).

Demolishers are too slow and simple to easily affect living tissue. Victims will notice the signs of wrecker contact long before they can do damage, and can easily wash or scrape them off. In game terms, demolishers inflict 1 DV (Physical damage) every 10 minutes, but pass on an itching sensation and visible, minor lesions to victims long before then.

Smart Demolishers: Not all demolishers are indiscriminate—some are programmed to only dissolve one specific material. Once introduced, they destroy the material until it is fully dissolved or they stop reproducing. Depending on the material and its function in a structure, this may or may not produce secondary effects.

Etchers

Etchers are used to temporarily or permanently inscribe a metallic pattern on the subject's bones or cartilages. These marks can be detected by magnetic anomaly detectors (MADs) and magnetic resonance imagers (MRIs). Temporary bone markings break up over time, but permanent treatments can only be removed with surgery that scrapes the bone clean. Once injected, a bone marker takes 8 hours to form. Etchers are used to identify prisoners, mark bioware, carry information, and a number of other purposes.

Monowire

Superfine monofilament wire, constructed using nanotech buckytubes, sees a wide variety of uses but is best known for its security applications. Nearly invisible and with high tensile strength, monowire can be stretched atop fences or in a maze pattern across doorways and hallways. Monowire garrotes, carried in a special wrist-worn container with a pull tab at one end, are also common among assassins. Some applications of monowire as a physical security measure appear on p. 251-256, *SR4*. To detect monowire when extended and taut requires a Perception + Intuition (3) Test.

Nanoscanner

Nanoscanners are hand-held devices that test blood, saliva, tissue, or other materials for nanites—especially taggant nanites. Located nanites can be analyzed for any data they carry (such as that carried by marker nanites), as well as for their general construction and purpose. Nanoscanners have a rating from 1 to 10 that determines the number of dice rolled to detect nanites in the sample (see *Nanotech Detection*, p. 106). Nanoscanners are expensive enough that they are not typically found in the hands of security guards, beat cops, or paramedics, but most clinics, forensics labs, and corporate security posts will have one.

NanoSpy

These nanites provide a discreet, flexible surveillance option to deploy in unsecured sites. Once sprayed or painted upon a surface (one application), a layer of hard machines constructs an invisible antenna, a distributed microphone, and a compound optical lens. The entire assembly is just under a square foot in surface area and appears to be no more than a very faint discoloration of the material it's been applied to. Noticing an application by sight is a Perception + Intuition (3) Test. Nanospies can even be applied like makeup to living creatures, turning a face into a camera. Imaging software corrects distortions caused by the surface area and compound lens.

A single application lasts for 24 hours. Nanospies are capable of effectively monitoring events within 5 meters. Beyond that, image and sound distortion makes capture unfeasible.

Savior Medkit

Originally developed by Shiawase Biotech, but now available from several corps, these advanced medkits combine cutting edge nanotech and advanced expert systems. When activated, the medkit injects a mixture of diagnostic and repair nanites into the bloodstream, as well as the standard stimulants, coagulants, and painkillers. The integral expert system directs the nanites to rejoin damaged tissue, stop blood loss, and minimize the onset of shock. The Savior is a Rating 6 medkit and follows all the normal rules for medkits (see p. 329, *SR4*). It also provides a +3 dice pool modifier



to Body Tests to stabilize critical wounds. The Savior's supply of nanites is limited and it must be restocked every 2 uses (or in the event of a glitch).

Smart Corrosives

This system consists of a swarm of nanites suspended in a clear chemical solution. Each nanite carries a payload of a corrosive compound. When applied, these nanites are programmed to seek out a certain substance, bind to it, and use the corrosive to melt it. Because the nanites can tell the difference between the target substance and anything else, the corrosive is applied in a manner that affects only the target, while everything around it remains untouched. Smart corrosive solutions can be applied via squirtguns, spray canisters, splash grenades, and a variety of other methods. Each solution is configured to corrode only a specific substance, from skin to metal to plasteel—the corrosive carried by the nanites will affect only that substance.

Universal Sealant

This nanotech application is used extensively in space and undersea habitats and is becoming increasingly common in a number of fields. It employs nanites suspended in a polymer gel/foam that hardens upon contact with air. When deployed (normally via handheld spray or squirtgun), the nanites bind seams, fracture lines, and punctures at a molecular level, filling in voids with the quick-hardening polymer. The result is an airtight seal with the consistency and hardness of steel. One canister can cover 1 square meter or numerous smaller holes. Standard sealant is only able to bind inorganic molecules, though surgical variants exist.

NANOFAXES

Though desktop nanoforges are becoming increasingly popular, their specialty is single-piece builds and the programmer's own designs. While industrial and commercial applications of nanoforge technology—as well as proprietary nanospecs—continue to be jealously guarded by the megacorps, some of the major players have begun licensing desktop nanofaxes to a select few outlets and elite stores.

Unlike desktop forges, individual nanofaxes are designed to produce only a specific type of product such as clothes, personal microtronics, or simple mechanical devices (ie. a nanofax at a *Zoé*

de Paris fashion outlet will be unable to produce a gun). To skirt Corporate Court restrictions on open-access nanotechnology fabricators, these are strictly controlled and count a number of integral failsafe, tracking, and anti-tampering systems that render them useless in the wrong hands. To further ensure against potential abuse, nanofaxes are programmed to only accept sanctioned feedstocks (buyable only from the licensing company), and the requisite design nanoschematics are kept exclusively on the licensing company's highly secure networks. To download them, a commercial nanofax must log-on and verify a valid license number that is hard-coded into the nanofax processor (stolen nanofaxes receive self-destruct commands).

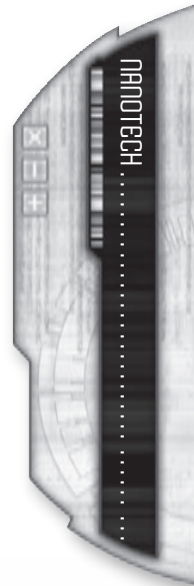
Though highly unlikely to fall into the hands of shadowrunners, some nanofaxes have found their way into the hands of corp-connected syndicates and even these receive a certain amount of scrutiny.

WEAPONIZED NANOTECH

Inevitably weaponized nanoware and nanoweapons have surfaced in a variety of security and covert functions in recent years. While they remain too expensive and impractical to see wide-scale use, they are effective assassination tools, deterrents, and terror weapons. Negative public perception of nanotechnology in recent years largely derives from the tragic and public use of such systems.

Weaponized nanotech follows the same general rules as toxins (p. 244, *SR4*) and have Vector, Speed, Penetration, Power, and Effect stats, with any unique effects noted in the individual descriptions. Multiple doses fall under the Concentration rules on p. 245, *SR4*. They can be applied via dart guns, splash grenades, aerosol sprays, squirt guns, gas grenades, and so on, according to their Vector.

Like nanoware, weaponized nanotech is also available as soft or hard machines. Soft machines are vulnerable to chemical and radioactive sterilization as well as nanite hunter nanoware. Direct exposure to a RFID eraser will halt hard machines, but once internalized, only a strong EMP burst, some other directed radiation treatment, or nanite hunters will slow them. At the gamemaster's discretion, bioware or cybernetic filtration and containment implants may hamper weaponized nanoware to some degree.



Nanotech	Type	Availability	Cost
Demolishers (per application)	Hard	8R	5,000¥
Smart Demolishers	Hard	12R	10,000¥
Etchers	Hard	8	500¥
Monowire (per meter)	Hard	16	1,000¥
Nanoscanner	—	8R	Rating x 2,500¥
NanoSpy (per application)	Hard	8R	7,000¥
Savior Medkit	Soft/Hard	6	2,000¥
Savior Medkit Supplies	—	6	500¥
Smart Corrosives (per application)	Soft/Hard	as corrosive + 4	as corrosive + 5,000¥
Universal Sealant (1 dose)	Hard	10	250¥

Cutters

Vector: Injection

Speed: 1 minute

Penetration: 0

Power: 6

Effect: Physical damage

Originally developed by Aztechnology's Genetique subsidiary from prototypes acquired from the Renraku Arcology, these lethal hard nanites have been around for more than a decade. Cutter attacks are short and brutal as the nanites' power is quickly exhausted, but this is more than enough time to cause critical damage to a target. Cutters are available as soft or hard machines.

Once injected and distributed throughout the victim's circulatory system, cutters begin to slash their way through blood cells, blood vessels, and organ tissues, causing massive internal hemorrhages and a shock response in the victim.

Intruders

Vector: Contact, Inhalation, or Injection

Speed: 1 minute

Penetration: 0

Power: 8

Effect: See Description

A new hazard in the Sixth World, intruder nanites are a specialized form of nanoinfectors. Intruders are hard machines that carry simple firmware and are designed to subvert electronic devices and cyberware. Once deployed—normally in a sticky gel solution—they seek out the nearest input-output electronic circuitry and feed the processor preprogrammed instruction sets. Since this is a hardware-based attack, it circumvents standard device protections (such as Firewalls). Specific effects must be preprogrammed when the system is acquired. Once inside a person, intruders will latch onto the first cyber system they find (barring a called shot this is left to the gamemaster's discretion).

Intruders have no Signal rating and rely on physical contact. To subvert a device the intruder nanites must win in an Opposed Test between their rating and the target item's Device or System rating (see *Sample Devices*, p. 214, *SR4*). While the user can simply command an infected device to behave normally, the intruders will simply re-execute their instruction set on the next Combat Turn (and will continue to do so until deactivated or ordered to stop). A tag eraser or system reboot destroys all of a device's active intruders. Most intruders cannot defeat encryption, so are ineffective against encrypted devices (gremlins, however, are unaffected by encryption).

Activators: Activators infect wireless-capable devices and perform one of two simple, yet annoying tasks: They either sub-

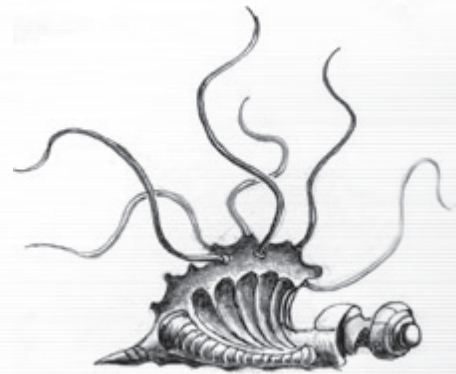
scribe the infected device to nodes without the user's permission, or open the device to universal unrestricted access. Such changes in access status are not necessarily apparent if the device isn't being directly monitored.

Broken Arrows: Broken arrows also infect wireless-capable devices, with an equally insidious effect. These intruders systematically overwrite AR objects, either deleting them, changing their function, or replacing them with other AROs (or in the worst case, spam advertisements). Any attempt to use the infected device via AR results in an automatic glitch. A Logic + Intuition (2) Test reveals false AROs, but does not allow the user to see the real ones they obscure.

Deactivators: Similar to activators, deactivators either unsubscribe the user's node access or close all of the device's wireless connections.

Fuzz: Fuzz intruders seek out both wireless-capable devices and DNI implants, then proceed to inject random sensory input (AROs, audio clips, icky smells, "ghost" sensations, etc.) in an attempt to disrupt the functionality and distract the user. Apply a +2 modifier to all of the user's activities while so distracted, until the infected device is disabled.

Gremlins: Gremlins target superconductive neural connections, fiber optics converters, and servomotor processors in cyberware. An infected implant will misinterpret neural commands, run through a series of random motions, or simply seize up. Treat any use of the device as an automatic critical glitch. At the gamemaster's discretion, the device may also act up on its own accord, or simply cease functioning (if always on). Unlike other intruders, gremlins cause permanent damage to the implant that can only be repaired with corrective maintenance or surgery (see *Installing/Repairing Cyberware or Bioware*, p. 126).



Nanofax Products

	Availability	Cost
Nanofax (Plastic/Fabric Fabrication Only)	12R	500,000¥
Nanofax (Electronic/Mechanical Fabrication)	16R	2,500,000¥
Nanofax Upkeep and Licenses (per year)	8R	50,000¥
Evo Worldwear Subscription (per year)*	—	35,000¥
Typical Licensed Item	—	5,000¥
Complex Licensed Item	—	10,000¥

*Similar subscriptions exist for all aspects of personal fashion, including scents, jewelry, and accessories.

Nanoinfectors

Vector: Contact

Speed: 1 minute

Penetration: 0

Power: Rating +4

Effect: Infects target with nanoware system

Nanoinfectors are modified versions of standard nanoware systems designed to allow the user to deploy them upon another host using physical contact as a vector. Different nanoinfectors can be transmitted through body fluid exchange or touch. Fluid-vector systems store themselves in the user's bloodstream; touch-vector systems in his or her epidermal pores (usually in the lips, hands, or other limbs).

Unless a nanohive is present to activate the system, nanoinfectors must first be primed using a chemical or electrical signal (defined at installation). Systems are programmed to "power down" on a second signal. Once primed, though, physical contact allows the nanoware to infect the target. Fluid-vector systems are particularly insidious, because they can transmit colonies through sexual contact. Touch nanoinfector systems cause momentary itchiness or irritation at the point of contact as the nanoinfectors burrow in through pores.

If the target loses the Toxin Resistance Test (fails to reduce the Power to 0), he is dosed with a sufficient nanite payload for the nanoware to take hold in his system. Nanoinfector versions of most common nanoware systems are available (carcerand-plus, taggants), while more obscure or dangerous system can be found on the black market (intruders, shrikes, cutters). Add the cost of nanoinfectors to the normal cost of a standard nanoware system and apply the listed modifier to the normal system's availability.

Nanoinfectors count as a distinct nanoware system, but their payload does not (until deployed, that is).

Shrikes

Vector: Contact, Inhalation

Speed: 1 minute

Penetration: -2

Power: 10

Effect: Nausea, Physical damage

Shrikes are next-gen cutter nanites. Unlike cutters, shrikes work on contact, penetrating a target's skin using artificial flagella (taking 2 full Combat Turns). After delivery, shrike nanites begin rending tissue on the cellular level, leading to a combination of open sores and internal bleeding. The drawback of shrike nanites is that their vector makes them indiscriminate; an errant wind or poor environmental seal can dose the user or innocent bystanders. Shrikes are currently only available as hard machines.

Surtr

Vector: Contact, Inhalation

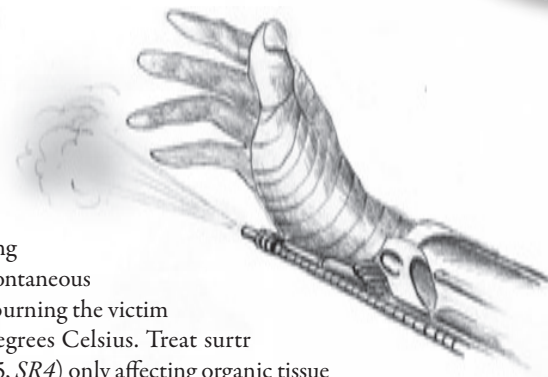
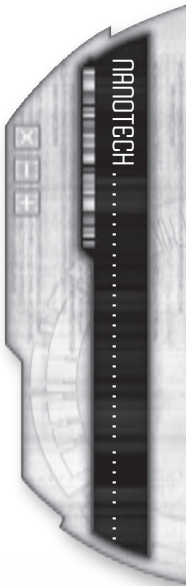
Speed: 1 minute

Penetration: 0

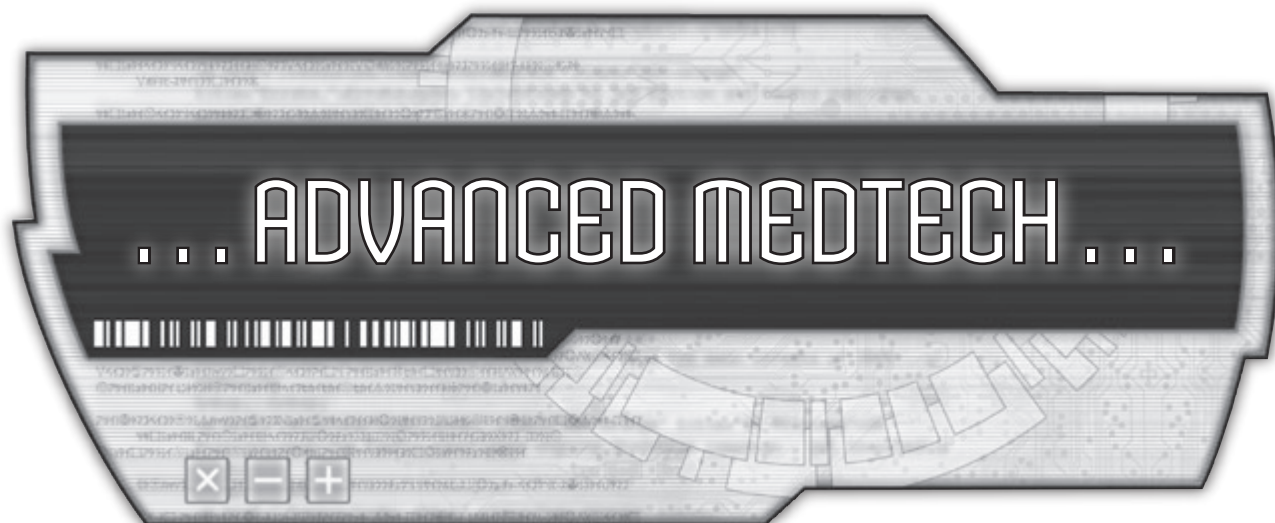
Power: 10

Effect: Physical damage (special)

Developed for interdiction purposes by Zeta-Imp Chem and stolen by the Winternight cult to use in their doomsday plans, surtr is an aerosol vector nanoweapon. This hard machine system is designed to remain airborne for up to 30 minutes on micro-propellers (while in this state it is vulnerable to strong winds and dissipation will reduce Power at the gamemaster's discretion). While in suspension, surtr appears as a cloud of reddish dust. When it comes into contact with organic tissue, its internal and external membranes collapse and its deadly payload of exotic chemicals mix. These chemicals react with water molecules in cells, acting as accelerants. The result is spontaneous combustion of living tissues, burning the victim at temperatures up to 500 degrees Celsius. Treat surtr damage as Fire damage (p. 155, SR4) only affecting organic tissue at first (though burning tissue may ignite other materials).



Nanotech	Type	Availability	Cost
Cutters (per dose)	Hard	12F	8,000¥
Intruders (per dose, Rating 1-6)			
Activators	Hard	8R	Rating x 500¥
Broken Arrows	Hard	10F	Rating x 500¥
Deactivators	Hard	10F	Rating x 500¥
Fuzz	Hard	12F	Rating x 1,000¥
Gremlins	Hard	16F	Rating x 1,500¥
Nanoinfectors (Rating 1-6)	Hard	+8R	+(Rating x 1,000¥)
Shrikes (per dose)	Hard	16F	10,000¥
Surtr (per dose)	Hard	20F	20,000¥



The clinic was closed, of course: it absolutely wouldn't do to have anyone come in unannounced during this operation. Orthus looked the doctor over with skepticism; his laid-back demeanor and scruffy facial hair didn't suggest professionalism. Outwardly, he looked to be in his mid-thirties; his dark shades and mannerisms hinted at a lifetime of cannabis use. He snarled and looked over at Tani and panted questioningly. Locked away in her chemsuit, she saw the world very differently than he did, and radiopathically sent over an OK signal. Their other compatriot with magesight wasn't of much use right now, so he'd have to rely on her.

Orthus growled, "We got the data, but it's still in the head. Also, our magician needs a new hand." Extensive facial reconstruction had left him virtually incapable of pronouncing the letter M. To emphasize his point, he held out the limp form of his companion, shaking him slightly so the shredded limb would be more obvious. Parts of the small Asian man sloughed off. Orthus tossed the bag onto the table.

The mass of the head proved too much for even the jumbo-meal bag; it tore open, spilling General Tso's chicken everywhere. Dr. Swayne was nonplussed "Dude, that bag is dripping everywhere!" Synthetic chicken grease and cerebral spinal fluid mixed poorly with the blood, leaving spiral patterns dribbling across the table. "That is totally uncool. Now I'm gonna to have to disinfect the whole room." The doctor continued to mutter as he snapped gloves into place and put the head into a multi-pronged apparatus.

Tani spoke up: "The datalock is tamper resistant. If an unauthorized external feed tries to get the data it'll erase the whole thing." She was using that tone she used when she hadn't eaten and there was blood on the ground. Orthus knew it well. The doctor waved her off and began jacking into his machine.

Remembering his unconscious compatriot, Orthus stopped Dr. Swayne before he had finished jacking in. "Our friend is nissing an arn, he needs your helf now." He shook the comatose man at the doctor again.

"You need to calm down, dude. He's a magician, right? He'll want a clonal hand, not some off-the-rack shit." He looked to Tani for some confirmation, but the impassive faceplate of her chemsuit was of little assistance.

Orthus just looked at him with puppy-dog eyes. "Oh, come on, man! I don't have a donor clone for this guy. It'll take a month to force-grow a hand for him."

The doctor pointed to a spray can on a shelf. "There's some spray skin. It'll keep him from leaking while I'm working on the head." He turned back to his work.



ADVANCED MEDICAL RULES

The basic rules presented in *Shadowrun, Fourth Edition* address the uses for First Aid and Medicine that characters need to clean up and mend themselves after a run. Groups are free to use any or all of the advanced rules in this chapter as they see fit to add further depth to various aspects of medical treatment and implantation. As always, the gamemaster is free to waive any rule if he believes it represents an unnecessary complication and subtracts from the group's enjoyment of the game.

Medicine in the 2070s is able to integrate machines into the body, extend life, and create the clones that allow broken body parts to be replaced. In the Sixth World, medicine goes beyond drugs and machines, and with the return of magic, the practice of traditional medicines is on an upswing.

A phenomenal amount of research has gone into medicine over the centuries and the progress has been amazing. Medical science has developed to the point where afflictions once lethal can be cured or prevented, and basic constants of the metahuman condition such as age, height, sex, weight, metatype, and ethnicity can all be adjusted. While such miracles are possible, they remain out of reach of many. Indeed, children still go blind for lack of the vitamins available in an orange rind, and the greatest killers are still respiratory infections—most of which are treatable, if you have the nuyen.

Worldwide, only forty percent of people seek treatment from licensed medical personnel when they face health problems, a number virtually unchanged in the last hundred years. To complicate matters, in many countries, the line between modern medicine and traditional medicine, bolstered by the advent of the Awakening, blurs or is absent altogether. It is a truism of anthropology that all peoples of the current age are modern regardless of their access to technology—and nowhere is that more apparent than in medical practices. The village healer of 2071 boasts a success rate that far outshines mere placebo, and in many cultures a holistic healer is still preferred to a modern medical professional.

USEFUL SKILLS AND SPECIALIZATIONS

When it comes to patching people up, three skills are essential:

First Aid: Described on p. 124, *SR4*, the First Aid skill is primarily concerned with mitigating the effects of wound trauma (see p. 242, *SR4*) and stabilization (p. 244, *SR4*). It can also be used to diagnose basic health and the severity of injuries, as described in *SR4* and also under *Diagnosis*, p. 125.

Medicine: The Medicine skill (p. 124, *SR4*) is concerned with long-term healing (p. 242, *SR4*), as well as with stabilization and diagnosis, just like First Aid. Medicine is also used for treating long-term illnesses, including the effects of diseases and toxins (see *Antidotes*, p. 246, *SR4*).

Most importantly for *Augmentation*, Medicine is the skill used for all varieties of surgical procedures and medical treatments, including magical health and gene therapy (Genetics is a valid specialization for this skill). Medicine is also used for implant surgery (p. 127), though the care and creation of implants is under the purview of the *Cybertechnology* skill.

Medicine also encompasses traditional medicine and alternative therapies. For these purposes, the gamemaster may

MEDTECH KNOWLEDGE SKILLS

Though they play a less active role, certain Knowledge skills may be useful to characters in a medtech context. Skills such as Biology, Chemistry, Pharmacology, Neurology, or even Engineering, Zoology, and Street Drugs might provide essential background information that can assist a character when examining an implant, diagnosing a disease, or brewing up a new drug cocktail. At the gamemaster's discretion, possession or successful use of a Knowledge skill may provide extra bonus dice to certain Active skill tests. On the other hand, a Knowledge skill rating may limit the amount of Active skill dice that can be applied to a test, under the assumption that skill at treatment is limited by a proper education.

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wish to allow additional specializations such as Acupuncture, Homeopathy, Herbalism, etc., especially if using the Mystical Healing Optional Rule (p. 123).

Cybertechnology: Detailed on p. 123, *SR4*, *Cybertechnology* skill handles the design, manufacture/growth, maintenance, modification, and repair of all implants, including cyberware, bioware, and nanoware systems.

OPTIONAL RULE: SEVERE WOUNDS

Shadowrun opts for an abstract approach to injury. If someone is injured, it can be assumed that they are bleeding, bludgeoned, or burned as appropriate, and that in some way they are physically impeded and hurting. Still, sometimes it may seem appropriate to have a character lose more than a liter or two of blood when repeatedly cleaved with a monowhip. After all, not every cut and wound can be shrugged off, and not all damage can be healed by time alone. Sometimes bones get broken, organs get shredded, and muscles torn beyond medical or magical repair. The following optional system allows gamemasters to introduce such drastic injuries to the game in a relatively free-form and story-driven way. Note that while severe wounds can be dramatic and memorable, they can also slow down play and may not be appropriate for all games. Don't sacrifice the game's fun or story flow just to inflict some extra grievous bodily harm—unless the character happens to deserve it, of course.

Severe wounds occur in one of three circumstances, each noted below. The exact nature, location, and extent of the wound is left to the gamemaster's discretion based on the situation, type of attack, vulnerable body areas, amount of damage sustained, and whether a called shot to a body part or obvious implant was involved. We offer several suggestions for each situation; gamemasters are encouraged to create their own, using these as guidelines. The demands and interests of the story should also be taken into account.

Glitches

Any time a glitch is rolled on a Damage Resistance Test or Healing Test, a severe wound is called for. This includes glitches



on Toxin/Disease Resistance Tests, tests for magical healing, and the Edge Test noted under *Heavy Damage* below.

A severe wound that results from a glitch creates some of complication that is serious but not life-threatening. Some possibilities include:

- **Agony:** For whatever reason, the damage inflicted is excruciatingly painful (think sliver under the fingernails). The character suffers dice pool modifiers for being wracked with pain, and may be disabled if the damage boxes suffered exceed his Willpower.
- **Concussion, Nausea, or Shock:** Treat as the effects of nausea (see p. 245, *SR4*).
- **Distraction Injury:** The character is blinded, has blood in his eyes, is seeing double, or his hearing is ringing. Apply a dice pool modifier to Perception Tests.
- **Impalement:** Some sort of object is stuck in the character's body, perhaps impeding his functionality, and will require trauma surgery to remove.
- **Impeded Movement:** The character has been inflicted with a sprain, fracture, charlie horse, or something that similarly impedes his range of movement. He may suffer dice pool and movement penalties.
- **Implant Malfunction:** An implant has been damaged but not destroyed, and will function erratically until repaired.
- **Infection:** The wound has been contaminated (though this may not be noticed), and will require extra care to prevent the character from becoming extremely sick.
- **Magical Misfire:** A character receiving magical healing finds that magic sometimes has a downside. Apply some unfortunate magical backlash. Perhaps the area being healed amasses with warts, sprouts hideous purple fur, or grows smelly and gangrenous.
- **Minor Disfigurement:** The damage results in noticeable scars or minor maiming (a finger, part of the lip, or ear). The injury is obvious, though social ramifications will depend upon individuals. A weeping gash across the face may not be a hit with the ladies, but it may get you some respect from the trolls in Myanmar. If the character doesn't want a recognizable and disfiguring wound, he will have to undergo cosmetic or transplant surgery.

Heavy Damage

Any time a character takes a large amount of damage at one time (7 or more boxes of either Physical or Stun damage from a single attack), the character makes an immediate Edge (1) Test. If the test fails, something is seriously wrong with the character and will not heal without medical or magical assistance. (Alternately, damage of this sort may be automatic with any wound that inflicts 7+ boxes at once).

Severe wounds that result from heavy damage are typically life-threatening. Possibilities include:

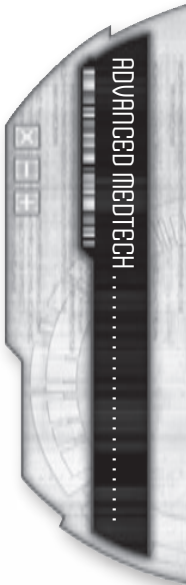
- **Blood Loss:** Wherever those bullets went, they took part of a major artery or vein with them. The character will leak precious bodily fluids, incurring extra damage as if he is suffering from Physical Damage Overflow (p. 244, *SR4*) until the wound is stabilized. Even blunt trauma can cause this kind of bleeding, though it will usually occur internally.

- **Brain Damage:** Head trauma disorients the character for now, and may result in partial disablement, memory loss, retardation, or even personality changes in the future.
- **Broken Bone:** A snapped rib, cracked femur, or shattered foot is making the character miserable, though he can still function. Apply dice pool and movement modifiers as appropriate.
- **Implant Destruction:** One of the character's implants' time has come. His internal commlink may now be a headweight, his chemical gland may have ruptured all over his pants, or his cybereyes may have been ripped from their sockets. The implant will either need some hefty restoration or replacement.
- **Irreparable Organ Damage:** The character loses a lung, his liver, or his spleen. Though he can continue to function for a short period, he needs serious medical attention and some organ transplant surgery.
- **Limb Loss:** The character is separated from his arm or another limb in a fashion that sprays blood everywhere. Arterial blood is under high pressure and can easily spurt up to 6 meters—be creative. The character suffers additional wound penalties and begins dying. The character begins taking additional damage as if from Physical Damage Overflow (p. 244, *SR4*) until stabilized. A transplant or cyberlimb replacement is in his future.
- **Major Disfigurement:** The character suffers a massive wound that threatens to uglify him for life. Whether he loses part of his skull, an eye and a nose, mangles his hand, or has all of the skin burnt from his face, he will need major cosmetic or transplant surgery and may be unrecognizable in the meantime.

Critical Glitches

Any time a critical glitch is rolled on a Damage Resistance or Healing Test (same as with glitch severe wounds), the character is in for a world of hurt. Critical glitch severe wounds are instantaneously debilitating and may threaten the character's existence—sometimes immediately. In all cases, treat the character as if he is suffering from Physical Damage Overflow (p. 244, *SR4*) until stabilized. Some suggestions include:

- **Anaphylactic Shock:** The character suffers an immediate and massive allergic reaction to some exposed substance. If not treated within minutes, the character will die.
- **Arcane Catastrophe:** A critical glitch on a magical healing test may transform the unfortunate character into something else for a (hopefully) temporary basis, such as a deformed critter, a crystalline statue, a backwards version of himself, or a fetid mass of skin and pus.
- **Crippling Break:** The character receives a broken bone or fracture (perhaps multiple or compound breaks) that immediately puts him down and will likely require trauma surgery to set. Healing times are doubled.
- **Paralysis:** The character has suffered a spinal injury or stroke, resulting in paralysis. At best, he'll require months of recuperative therapy. At worst, he'll need gene therapy or be paralyzed for life.
- **Seizure:** Inflicted damage somehow triggers a sudden, convulsive seizure for several minutes; perhaps an implant was damaged in just the wrong way. The character is paralyzed for the duration and disoriented afterwards.
- **Severe Organ Failure:** The character's heart stops, his lungs collapse, or he suffers some similar serious organ failure. Even if



stabilized, he will need transplant surgery in the near future.

- **Stunned:** Whatever hit the character took the wind out of him. Though conscious, the character is effectively incapacitated and may not move until recovered. Treat as the effects of nausea (see p. 245, *SR4*). If the number of damage boxes taken exceeded his Body or Willpower, as appropriate, he is simply unconscious. He may be revived with a proper First Aid Test, or he may have to sleep it off.

Caring for Severe Wounds

Depending on the nature of the damage inflicted, a severe wound may require surgical care in the form of cosmetic surgery, trauma surgery, implant repair, or organ transplants. The character may also require long-term medical care or magical healing. At the gamemaster's discretion, the character may not heal any further damage until the severe wound is adequately treated. Likewise, magical healing may or may not be effective in repairing certain instances of extreme trauma.

CARE AND COSTS

It goes without saying health care and medicine is big business in the Sixth World. Hospitals and franchise clinics are run by major medical corporations and offer the paying client services ranging from organ cloning to cosmetic surgery to armed emergency response. Private clinics tend to cater to specialized markets or select clientele. Private practices play the family doctor card or eke out a living in specialties not profitable enough for the majors. A few nations and charitable institutions strive to maintain public health services and free clinics, but these are understaffed, under equipped, and a shadow of what private providers offer. Illegal

shadow clinics and unlicensed street docs populate the fringe, providing illegal and untraceable services to those in need of secrecy, anonymity, or illegal augmentation.

Finding Treatment

Finding a doctor to give you an annual checkup, treat a minor injury, or administer long-term care is easy—just consult your local online listings. When you're in a bind, though, finding medical help might not be so easy. While getting to a hospital or franchise clinic is a matter of following GridGuide arrows, finding a doctor who will treat you without asking questions, calling the Star, or filing medical records can be more challenging. Likewise, back-alley chopshops and black clinics tend to be more discreet, so finding a trustworthy street doc when you need some holes patched or an illegal upgrade can be difficult.

Gamemasters may use a standard Availability Test (see p. 303, *SR4*), subject to any appropriate modifiers, to determine if an acceptable *black market* medical care provider can be found. Note that for legal care—which requires a valid SIN and good credit rating, natch—no test is necessary (though waiting in the emergency room may take some time). Note that a character may also have a fixer or some other contact search for him (see *Swag*, p. 280, *SR4*). It might be a good idea to track down avenues of medical care *before* you need it (spending 12 hours to find a *curandera* is no good if you're bleeding out right now).

For the purpose of the Availability Test, a clinic has an Availability interval (p. 303, *SR4*) based on the price of receiving basic care from it (as noted on the Medical Providers table, below), regardless of what services the clinic is actually being called upon for.

MedTech Providers	Typical Skills	Availability/Interval	Basic Care	Intensive Care	Services
Traditional Healer	2–4	4/12 hours	100¥ (Outpatient)	NA	a, sometimes k, l
Local General Practitioner	3–4	4/12 hours	100¥ (Outpatient)	NA	a, b
Street Clinic	2–4	4/12 hours	100¥ (Outpatient)	NA	a, b
Public Hospital	2–4	6/12 hours	250¥	500¥	a, b, c, d, e, f, i
Bodyshop	2–5	4/12 hours	250¥	1,000¥	a, b, e
Private Hospital	4–6	8/1 day	500¥	1,000¥	a, b, c, d, e, f, i
Street Doc	1–6	6/12 hours	500¥	1,000¥	a, b, c, d, e
Corporate Hospital	4–7	16/1 day	1,000¥	1,000¥	a, b, c, d, e, f, g, i, j, k, l
Elite Clinics	5–6	16/2 days	1,000¥	2,000¥	a, b, c, d, e, f, g, k, l
Elite Shadow Clinics	6	20/1 day	2,000¥	4,000¥	a, b, c, d, e, f, g, k, l
Delta Clinics	6–7	24/1 week	5,000¥	10,000¥	a, b, c, d, e, f, g, h, k, l

Service Guide

- (a) General medical care.
- (b) Basic hospitalization.
- (c) Intensive care.
- (d) Surgery and major trauma.
- (e) Implantation (basic and alpha-grade cyberware/bioware).
- (f) Implantation (beta-grade cyberware/bioware, cultured bioware, basic gene therapies, nanoware);

- (g) Implantation (nanocybernetics, all genetech).
- (h) Implantation (deltaware, experimental genetech and nanoware).
- (i) Ambulance/emergency services.
- (j) Armed emergency response.
- (k) Magical healing.
- (l) Long-term magical care.



In the case of augmentation technologies, though clinics tend to specialize in particular fields, once a clinic has been located that can provide a certain grade of implant, a character shouldn't have to travel the world looking for a place capable of installing another implant of the same grade or type.

Footing the Bill

Just as not all medical services are the same, not all carry the same price tags. The prices given for medical care (see *Hospitalized*, p. 261, *SR4*) are typical for going to your local hospital or medicare contractor and checking yourself in.

While, if your money's good and you don't have corp security tracking you down, this may be a decent enough plan, there are times in the lives of shadowrunners when this is not going to fly. Medical care is available from some incredibly sketchy individuals, and that's good news for people who want to pay in trade, pay later, have records of their medical procedures not leaked to authorities, and so on. As a rule, medical care that is illegal or "off the books" can cost up to double the standard costs, at the gamemaster's discretion. Tipping your street doc is encouraged.

Medical Care for the Awakened and Technomancers

The Awakened respond better to the works of magical healers and witchdoctors than do mundane individuals, even as mundane characters fare better under the electronic eyes of a medkit than their Awakened colleagues. Awakened individuals respond erratically to many standard treatments; consequently, all Biotech and Medicine tests suffer a -2 dice pool modifier when used on Awakened patients (as noted on the Healing Modifiers table, p. 244, *SR4*). Characters may specialize their Medicine skill in Magical Health, however, effectively negating the penalty. This is one area where traditional medicine stands at a marked advantage over modern medical techniques. If the character is using the Traditional Medicine or Magical Health specializations of the Medicine skill, such penalties are negated.

The delicate metabolism of technomancers is also particularly susceptible to the invasive and aggressive nature of many modern medical techniques and responds equally well to traditional medicine as the Awakened; consequently, the rule above applies equally to technomancers.

Long Term Magical Care

Even though multiple uses of healing magic are of limited effectiveness in further restoring an individual to health, having an attending physician who is also Awakened can prove extremely useful. An Awakened physician can help pinpoint potential health issues, pre-empt problems, and fine-tune treatments through judicious use of Assensing and auxiliary Detection or Health spells (she might be unable to heal the wound further, but an infection can be stopped in its tracks with another spell). To provide Long Term Magical Care, the practitioner must possess a Magic attribute and the Assensing skill. Patients benefiting from Long Term Magical Care receive a +2 dice pool modifier to their Healing Tests while hospitalized.

Not all clinics can afford a resident magical physician, but those that do charge richly for their services.

OPTIONAL RULE: MYSTICAL HEALING

A healing spell might be a powerful tool, but once it has been employed on any set of injuries, there is nothing more that it can contribute. Traditional medicine, also revived since the Awakening, offers additional possibilities. Alternative therapies and traditional lore, ranging from acupuncture to herbalism and from homeopathy to reiki, focus on restoring a body and spirit to holistic well-being, thereby aiding the natural healing process.

Unlike First Aid, traditional medicine is not meant to be applied in combat. The healer must possess an appropriate Knowledge skill to perform the healing (i.e., Acupuncture, Shiatsu, Kundalini techniques, etc); the rating of this skill caps the number of hits possible on Healing Tests. Mystical traditional healers use one of two approaches to curative therapies depending on their particular background (the effects are not cumulative with each other or modern medicine):

Healing with Assensing may be used to harmonize and strengthen the body's living energies, *qi*, or *kundalini* by stimulating energy nexi in the patient's aura (i.e., chakra points, meridians, qi nodes, etc). This is typically achieved by direct stimulation (e.g., acupuncture, fuming) or by a laying-on of hands (e.g., reiki, shiatsu). While the appropriate procedure varies according to tradition, the character makes an Assensing + Intuition Test (instead of the usual Medicine Test). Each hit provides +1 die to any subsequent Healing Tests the patient makes for healing through rest.

Healing with Enchanting focuses on the use of herbal, animal, metal, and mineral-derived remedies to purge or restore the body's humors or fluids. This is the path followed by homeopathic healers, herbalists, witch doctors, and potion-makers. A character following this path must make an Enchanting + Magic Test (instead of the usual Medicine Test), with each hit adding to the patient's subsequent Healing Tests. If a character utilizes an alchemical reagent (refined or better—see p. 81, *Street Magic*), she gains an additional +2 dice pool bonus to the test above.

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INCOMING FEED.....



MEDICAL EQUIPMENT

Medical tools, like other tools, are available in kits, shops, and facilities. The medkit described on p. 329, *SR4*, can be used on one patient at a time and is quite portable. Portable and non-portable versions of all kinds of medical equipment exist, though shops and facilities are more “mobile” than “portable” in the traditional sense. A non-portable medkit is called a medical station, and is a staple of hospitals and clinics the world over. Mobile medical facilities are pretty much only found in militaries and places where the land itself moves around, such as the Trans Polar Aleut nation.

A medical shop or facility has substantially more diagnostic gear than does a simple medkit. In poorer parts of the world, a “hospital” is simply a building with one or more medkits in it. A true medical shop has enough gear that it counts as a Rating 8 medkit. A true facility has enough gear that it counts as a Rating 10 medkit. Such quality comes at a price greater than the

extra space and nuyen: medical equipment beyond the medkit is substantially less “idiot proof” and provides no bonus to untrained individuals.

While a shady black clinic might contain only a single facility or even a shop, major hospitals usually incorporate many shops, facilities, and stations. For example: Tacoma General Hospital has 117 medical stations (Rating 3–6), 29 medical shops, and 6 medical facilities. On the other end of the spectrum, Dr. Glenn Swayne operates a single medical facility in the San Fernando Valley.

Using Medical Equipment

Medkits can rival the skill of a trained paramedic, though they still require user input. A medkit will tell you how to set a bone and even provide the materials necessary to accomplish this, but a medkit alone lacks the manipulators and strength to immobilize a patient’s arm. The maximum number of boxes that First Aid can heal is the Rating of the medical equipment or the First Aid skill of the character, whichever is higher (see pp. 242–244, *SR4*). So it behooves characters to use the very best medical equipment when dealing with severe injuries. On the other hand, while gloriously detailed, three-dimensional AR representations of injuries and treatment are helpful, they are far from sufficient, and it is still very much in your interest to get medical attention from a skilled medical practitioner as well.

Equipment	Cost	Maximum Patients
Medical Station	70¥/Rating	2
Medical Shop	10,000¥	4
Mobile Medical Shop	15,000¥	2
Medical Facility	200,000¥	8
Mobile Medical Facility	300,000¥	4

Remote Medical Operations

In the wireless world, virtually all medical equipment is capable of being remotely operated. This does not mean, however, that the equipment can be remotely operated particularly well. A medical shop or medical facility is generally fully equipped for remote operations, but a medkit or autodoc is difficult to use in this capacity. Remote operations run through a medkit or autodoc carry a -2 dice pool penalty (as noted on the Healing Modifiers table, p. 244, *SR4*). Remote operations run through a medical shop (even a mobile medical shop) are performed much more easily, and do not suffer the -2 penalty. Furthermore, these kinds of equipment are intended to be used in VR mode, and Biotech skills are considered Vehicle skills for the purpose of the control rig cyberware when used through a medical shop or medical facility.

DIAGNOSIS

Both First Aid and Medicine can be used to gauge a character's general health, ascertain the severity of wounds, diagnose symptoms, identify diseases and toxins, and so forth. The diagnosing character simply makes a First Aid or Medicine Test against a difficulty threshold set by the gamemaster, as appropriate to the character's condition. The more hits scored, the better the evaluation.

Diagnostic Profiles

When it comes to surgical procedures, implantation, and other advanced medtech treatments, more careful analysis is required. Surgeries demand planning, pharmaceutical regimens may clash with implants, bioware must be protein-matched, genetic treatments could have disastrous effects on someone if not DNA-compatible, and a misaligned neural pathway could leave a cyberlimb painful and inert. Consequently, before a disease can be treated, a laser scalpel deployed, or a nanite injected, a diagnostic analysis of the patient needs to be compiled.

Fairly intensive testing is required before any treatment is prescribed, or any surgical procedure can be performed. By 2070, the testing itself takes a minimum of 30 minutes and requires a successful Diagnostic Test. In the case of cultured, customized, or high-grade 'ware, such testing must be performed before the implant is even grown/developed. As always, the gamemaster is free to ignore this complication in the interest of story and game flow.

A Diagnostic Test is an Extended Logic + Medicine (variable, 30 minutes) Test. The threshold needed to develop a sufficiently detailed map of the subject's general health, blood and body type, allergies, genetic profile, and neural pathways to proceed with an installation are noted on the Diagnosis Table. Note normal healing modifiers (p. 244, *SR4*); bonuses from medical equipment also apply.

Once this diagnostic is complete, the physician has all the information necessary to build a medical blueprint that can be used to perform multiple implantations, surgeries, or even simple health checks. Providers that offer contracts require clients perform a full diagnostic checkup every six months to keep their files updated, since data can quickly become obsolete. This medical file adds +4 to the next Diagnostic Test for the patient. Obviously such information is intended to be protected by doctor-patient confidentiality.

Detecting Implants and Enhancements

Though millimeter-wave cyberware scanners can be used to detect cyberware (p. 255, *SR4*) and nano-scanners to detect nanoware and nanocybernetics (p. 112), enhancements such as bioware and genetic treatments can be quite difficult to detect without extensive biochemical analysis. At the gamemaster's discretion, diagnostic profiles are likely to turn up some (but not all) enhancements.

A special diagnostics check, however, can be performed with the specific intention of identifying all traces of medtech enhancements: checking for nanites, searching for type O tissue, analyzing cell decay that might indicate genetic manipulations, and so forth. Handle this like the Diagnostics Test above, but with an interval of 1 hour.

DIAGNOSIS TABLE

Procedure	Diagnosis Test Threshold
Cosmetic Surgery	4
Organ Transplant	8
Implant Surgery/Repair	
Basic	8
Alphaware	12
Betaware	16
Deltaware	24
Gene Therapy	16
Nanoware Installation	16
Implant/Enhancement Detection	20

UNDER THE KNIFE

In the dangerous shadows, going under the knife is often commonplace, whether it's to patch up a nasty bullet wound, have some cosmetic surgery done, or replace your synthacardium with the upgrade that your friendly neighborhood street doc just got in. A character performing surgery uses the Medicine skill and its specializations, and each of the following sections outlines the relevant tests.

Surgery Damage

Even in the 2070s, most implantation and surgical interventions can be dangerous and damaging depending on how extensive or invasive they are. In game terms, such damage is simplified to a DV incurred at the end of each procedure (regardless of whether it was successful or not) and that may be resisted as normal. Any unresisted damage may be healed as usual following the operation. Characters undergoing several major procedures or who are already wounded may want to heal up before undertaking multiple operations.

Surgery Glitches

A glitch during a surgical operation opens the door to a number of options. Perhaps the doctor lost an instrument inside a chest cavity, a vein was accidentally nicked (leading to future internal bleeding), the implant was miswired in such a way that the character exhibits a facial tic whenever he uses it, or the subject simply ends up with a nasty-looking scar. One easy option for handling

a surgical glitch is to simply increase the surgical damage by 1D3 DV or doubling the healing time.

Critical glitches are, of course, more serious. Not only has the operation failed, it has failed badly. Perhaps the operation has triggered some kind of organ failure, the character suffers some sort of massive allergic reaction, or the implant is non-functioning but somehow stuck inside the body. Alternately, simply double the surgery's DV and/or double the healing time.

Optional Rule: As an added surgical risk, a surgery glitch can increase the Essence Cost of an implant by +25 percent. Likewise, a critical glitch not only results in the item failing to be implanted, but the subject suffers loses 25 percent of the item's Essence cost anyway.

COSMETIC SURGERY/BIOSCULPTING

Cosmetic surgery encompasses all forms of non-implant body modification in 2070. The act of biosculpting means exactly that: you can change your body to however you want it to look. Muscle tone, body proportions, length of arms and legs or overall body height, all can be changed—at an expense in time and nuyen. Many of these treatments do not even require surgery, but can be performed with hormone cocktails or simple implant techniques. Likewise, facial cosmetic surgery allows a complete reconstruction of the face, to pretty much any specification. The various options available are all detailed under *Biosculpting*, p. 61.

Specific cosmetic bioware and cosmetic cyberware implants should be treated separately and fall under the normal *Installing/Repairing Cyberware and Bioware* rules below.

TRAUMA SURGERY

Given the abstract nature of damage in *Shadowrun*, trauma surgery is not a real necessity, and can be considered part and parcel of the use of Medicine to heal a wounded character. Trauma surgery may play a role for certain cinematic purposes or when using the severe wounds rule (p. 120).

Trauma surgery is life-or-death surgery, the procedure used to fix a badly damaged character. It can be used to stabilize a character when other attempts have failed (see *Stabilization*, p. 244, SR4), remove foreign objects the body (bullets, impalements, etc.), or fix a wound that would not otherwise heal on its own (but does not necessarily require a transplant). Trauma surgery can also be used to inflict surgical wounds without killing the patient, for the purpose of torture.

The threshold for the Medicine (Trauma Surgery) Test is determined by the gamemaster, according to the intent of the operation. Trauma surgery does not inflict surgical damage.

TRANSPLANTS AND ORGAN REPLACEMENT

It is a simple fact of life in 2070 that a metahuman can receive parts of other metahumans and even machines and still make a functional whole. Thus, when parts wear out or simply are found to be insufficient for the tasks at hand, they can be replaced with new parts.

Replacing a failing organ requires the prospective organ, a medical shop, and the immobilization of the patient. A metahuman can only accept two kinds of organ replacements without downing massive amounts of immunosuppressants: generic and cultured, though neither costs Essence to implant. Generic (or type O) organs are grown from a common stock that is hypoallergenic to all metahumans, and are usually available, at worst case, by next-day mail. Generic organs are not available to non-metahumans such as shapeshifters, vampires, or dragons. Cultured organs are grown from the tissue of someone with a genetic match to the intended recipient. Usually, that means that it is grown from the intended recipient's own tissue, but could easily enough be from a twin or previously established medical clone. Cultured organs are not transferable from one person to another (unless they are twins/clones).

Growing Organs/Clones

If a cultured organ is desired, and is not already available, it must be grown. Medical facilities can force grow individual body parts or entire bodies in a matter of weeks. Solitary organs can be cloned in a shorter time than can entire bodies, but are actually more expensive to keep alive than complete medical clones.

Cloning an organ requires a medical facility, a tissue sample, and a Medicine (Organ Culture) + Logic (6, 1 hour) Extended Test to get started. The actual growth time varies by organ, as noted on the Body Part table. A contaminated, insufficient, or non-metahuman tissue sample makes cloning an organ more difficult. Characters with access to expensive and specialized cloning gear can produce cloned samples in half the time, but the difficulty is doubled. A special cloning shop can be used in lieu of a medical facility, though space constraints prevent the cloning of full bodies.

INSTALLING/REPAIRING CYBERWARE AND BIOWARE

The implantation of cybernetics or bioware is much like replacing an organ. Healthy or damaged portions of the body must be removed to make room for new chrome or tissue.



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Cosmetic Surgery	Extended Test	Surgery Damage
Cosmetic/Biosculpting		
Minor	Medicine (Cosmetic Surgery) + Logic (4, 1 hour)	3P
Moderate	Medicine (Cosmetic Surgery) + Logic (8, 1 hour)	5P
Severe	Medicine (Cosmetic Surgery) + Logic (16, 1 hour)	7P

Trauma Surgery	Extended Test	Surgery Damage
Trauma Surgery	Medicine (Trauma Surgery) + Logic (variable, 1 hour)	—

Procuring Cyberware

Cyberware of basic and alpha grade is available off-the-rack in a variety of sizes and styles to accommodate most individuals. This means that a character can plausibly just sit in the chair and get a datajack implanted with no wait (assuming that the facility has a compatible datajack on hand). Beta- and delta-grade cyberware, on the other hand, must be tailored to the intended recipient. Tailoring a cybernetic implant is an involved process that requires a medical facility or a cybertechnology shop, some very expensive components, an exhaustive diagnostic exam of the prospective patient, and a few days of customization by a qualified technician.

Procuring Bioware

Bioware (type O) is available ready-made in basic and alpha grades from a number of corporate suppliers and bio-banks. Beta-grade and better bioware must also be tailored to and grown from the intended recipient's tissue, just like cultured neurological bioware. Cultured bioware may also be alpha, beta, or delta grade.

Crafting a bioware implant first requires that a tissue base be created with the desired blend of traits and protein matched. This requires a tissue sample from the prospective patient (or some type O tissue for basic bioware). Once the cell-line is established, the new organ must be vat-grown using a collection of viral modification agents, surgical nanoprobes, and a medical facility and takes 2–4 weeks, double that for anything above basic type O grade. The process of forced-growth cloning has come a long way, but growing a standard piece of bioware to spec takes as long as the

equivalent (or similar) organ. Growing a bioware organ is more difficult than a normal organ because it is a genetic chimera using a non-naturally occurring bio-template.

The Implant Surgery

Once the implant is ready, regardless of whether the implant is cyberware or bioware, the surgery requires a medical shop, the immobilization and anethetization of the patient, and a qualified character to succeed in a Medicine (Implant Surgery) + Logic Extended Test (see the Implant Surgery Table for Thresholds and intervals). All Implant Surgeries have a Test interval of one hour.

Repairing Implants

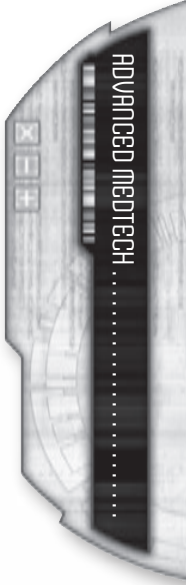
Should a particular implant become damaged or disabled in some way—perhaps through a called shot attack, infection with gremlins, intruder nanites, a simple glitch, or as the result of the severe wounds rule—then it must be repaired to get it working again (unless the gamemaster rules that it has been completely ruined and must be replaced). The nature of the repair effort may vary wildly, depending on the implant itself, its accessibility (is it reachable externally, or buried deep inside the body, thus requiring surgery?), and the nature of the damage. Some repairs might even be conducted remotely via the Matrix, such as patching up the software or downloading a firmware upgrade. Ultimately, the gamemaster decides what efforts are required, using the Build/Repair Table (p. 125, *SR4*) as a guideline. If surgery is called for, the surgery damage is the same as if installing the implant in question.

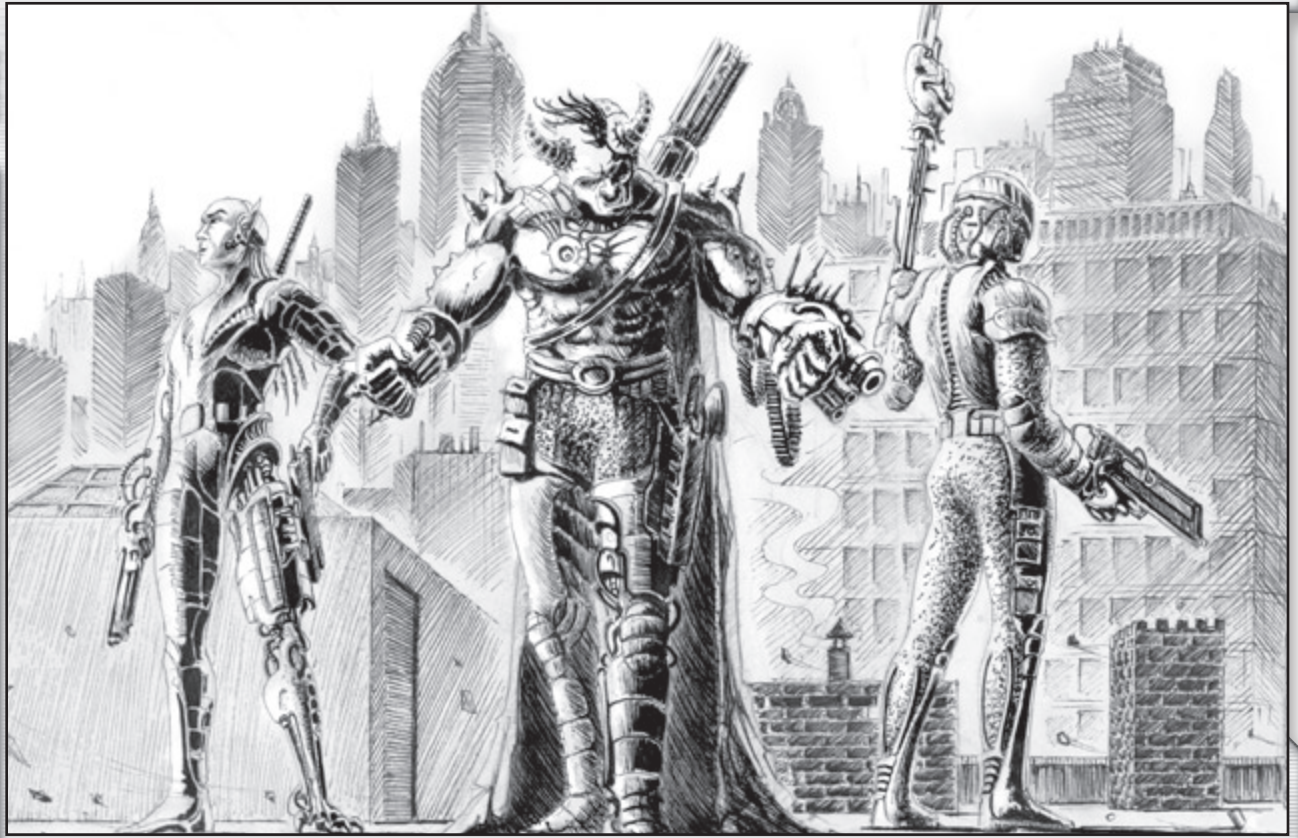
Transplant Surgery	Extended Test	Surgery Damage
Organ Transplant/Replacement	Medicine (Trauma Surgery) + Logic (4, 1 hour)	5P

Body Part	Cost (Type O)	Cost (Cultured)	Growth Time
Eye	4,000¥	4,000¥	2 Weeks
Organ	6,000¥	9,000¥	3 Weeks
Hand/Foot	8,000¥	8,000¥	3 Weeks
Full Limb	21,000¥	25,000¥	4 Weeks
Skin/Hair	300¥	500¥	4 hours
Spinal Cord (Research Only)	Not available	70,000¥	6 Weeks
Full Body	25,000¥	40,000¥	8 Weeks

Implant Surgery	Extended Test	Surgery Damage
Implant Surgery (Cyberware/Bioware)		
Basic Grade	Medicine (Implant Surgery) + Logic (4, 1 hour)	*
Basic Grade (Cultured Bioware)	Medicine (Implant Surgery) + Logic (8, 1 hour)	*
Second-Hand	Medicine (Implant Surgery) + Logic (6, 1 hour)	*
Alphaware	Medicine (Implant Surgery) + Logic (8, 1 hour)	*
Betaware	Medicine (Implant Surgery) + Logic (12, 1 hour)	*
Deltaware	Medicine (Implant Surgery) + Logic (20, 1 hour)	*
Symbiont	Medicine (Implant Surgery) + Logic (4, 1 hour)	3S
Implant Repair	Cybertechnology + Logic (variable, 1 hour)	As implant surgery

* See the Implant Surgery Damage table, p. 128





INCOMING FEED.....



REPLACING/UPGRADING CYBERWARE AND BIOWARE

Most augmentations, whether bioware, cyberware, genetech, or nanocybernetics, have an associated Essence Cost. When a character has an implant removed to be replaced or upgraded, this leaves what is known as an “Essence hole”—a disparity between the total Essence Cost of her implants (see *Cyberware and Bioware*, p. 84, *SR4*) and her current Essence. This Essence hole never “heals” naturally. It may, however, be used as a “credit” for any new implants of the same type (cyber- or bioware)—simply deduct the Essence hole from the new implant’s Essence cost be-

fore applying it to your total. In other words, if you remove one cyberware item that had an Essence Cost of 1, you may install up to Essence Cost 1 of new cyberware without lowering your Essence total. Any cost over 1 would be deducted as normal. Note that a bioware implant would not be able to fill that same hole, however—cyberware only.

Essence holes are important when replacing or upgrading implants. If a character replaces an implant with one of a higher grade, the new implant may well have a lower Essence Cost than the old one and the character will develop an Essence hole that she can fill with further augmentations. Likewise, upgrading an implant often increases its Essence Cost—characters might choose to remove another implant to create an Essence hole so she can upgrade her implant without losing more Essence.

Note that Essence lost from other sources—addiction, a blood spirit’s Energy Drain power, etc.—does not leave an Essence hole that may be filled up with implants. That Essence is lost for good.

IMPLANT SURGERY DAMAGE TABLE

Bio-/Cyberware Implant Essence Cost*	Severity	Damage Value
Less than or equal to 0.2	Superficial	3S
0.21–0.5	Minor	3P
0.51–1	Moderate	5P
1+	Major	7P

* Cybersuits must be installed in their entirety; use the total Essence cost of the suite to calculate surgery damage.

Sketch (Essence 3) wants to upgrade one of his cyberarms. The current Essence Cost of his cyberarm is 1, and the Essence Cost for his upgraded arm will be 1.5. Sketch decides to remove his aluminum bone lacing (Essence Cost 1) along with his old cyberarm, leaving an Essence hole of 2 (1 + 1) for cyberware. He installs the new arm, but that only takes up 1.5 Essence, so he still has an Essence hole of 0.5. His Essence remains at 3, even though he currently only has 2.5 points of cyberware.

GENE THERAPY

Any treatment that involves modifying genome expression is a traumatic and draining procedure of cellular transformation and metabolic readjustment that carries significant risks if not performed in a proper clinical environment (e.g., a hospital with genetic capabilities, or elite private and shadow clinics). Even minor genetic changes often involve phenotypic transformation and reorganization, requiring the re-balancing or fine-tuning of metabolic pathways, and readjustment of the body's regulatory systems—all processes that must be carefully watched for complications.

Side effects of treatments range from flu-like sickness to painful and traumatic transformation. The recipient is therefore typically sedated and vat-immersed in a sterile suspension that facilitates treatment and acts as a contingency against unforeseen and adverse metabolic, immune, or allergic reactions that require immediate intervention. During their tank immersion period, patients may interact with the outside world through the Matrix (with the *simsense* module editing out pain feedback from the body).

While geneware is almost universal by definition, gene therapies require that the transfection vectors used be tailored to the subject and adapted to take into account the existence of meta-genes, prior implants, prior therapies, and other factors.

As with nanoware, to perform the necessary adjustments, a genetic sequence must be obtained, using the rules for diagnosis (p. 125). The geneware vector is then tailored to the subject's genetics. When this step is complete, the gene therapy proper begins (typical treatment duration ranges are listed with the various treatments on pp. 87–93).

INSTALLING NANOWARE

Not everyone takes well to nanoware installation and allergic or immune reactions are not uncommon. To guarantee a character's body will accept a nanoware system without risk to life and limb, a genetic sequence must be obtained and then immune tags (hard machines) and protein-matched markers (soft machines) incorporated into the nanoware system. This genetics sequence is obtained with a standard Diagnostics Test (p. 125).

Preparing the nanoware requires a medical facility; once prepared, the only skills required to implant it into a subject are the ability to press "inject" on a general purpose injector. If a character risks an unscreened installation, they must roll an Edge (1) Test. If they fail, they suffer a serious immune or allergic reaction (use the stats for Influenza below as a guideline) and the nanoware system is irretrievably damaged.

To implant nanocybernetics use the standard rules for *Installing/Repairing Cyberware and Bioware* above.

DISEASES, PATHOGENS, AND OTHER CONDITIONS

Pathogens, diseases, and other degenerative conditions use similar rules to toxins (see pp. 244–245, *SR4*) in how they react to the body, with the difference that the foreign agent has the capability to grow and increase the degree of infection over time.

DISEASE ATTRIBUTES

Like toxins, each pathogen has several game mechanic ratings. The main difference between diseases and toxins is that diseases have a repeated effect, as noted under *Speed* and *Power* below.

Vector

The vector is the method by which the disease infects the host. Diseases spread by *contact* must touch the target's skin. A chemical seal (see p. 317, *SR4*) offers complete protection unless breached. Diseases spread by *ingestion* may be in food or liquid consumed by the victim. Diseases spread by *inhalation* may be transmitted to the victim via his breathing apparatus; a character wearing a gas mask, chemical seal, or using an activated cyberware internal air tank (p. 334, *SR4*) is immune to its effects. Diseases spread by *injection* must be injected into the target's bloodstream or alternately through an open wound.

Speed

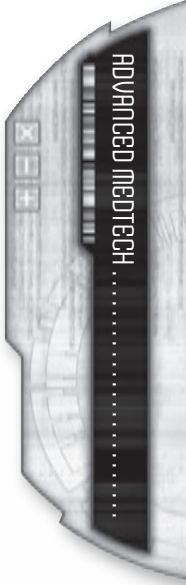
A pathogen's Speed represents the incubation period between initial exposure and the first Disease Resistance Test. It also represents its period of effect—how long before the effects kick in again, and another Disease Resistance Test must be made.

The number in parentheses is the *minimum* number of Disease Resistance Tests the character must make. Even if a previous test reduces the Power to 0, the character remains infected and must make another test to resist the effects again after Speed duration has passed, until the minimum number of tests have been made.

Even in the Sixth World, some diseases have no cure, and those infected with them must live their lives as best they can until medical science or magic can help them. Such diseases are marked (until cured) in the parentheses following Speed, and the character must continue to make new Disease Resistance Tests at the appropriate intervals indefinitely—possibly for the rest of their lives.

Penetration

Similar to Armor Penetration for weapons, a disease or pathogen's Penetration rating affects the rating of any protective system used to defend against it, including pharmaceuticals.



Gene Therapy	Extended Test	Surgery Damage
Gene Therapy	Medicine (Genetics) + Logic (6, 1 day)	3P
Nanoware Installation	Extended Test	Surgery Damage
Nanoware Installation	Cybertechnology (Nanoware) + Logic (6, 1 day)	3S

Power

The Power of a disease represents its potency. In most cases, Power represents the DV (Stun or Physical) inflicted by the substance, as noted under Effect. This damage is reduced with a Disease Resistance Test (see below); if the damage is reduced to 0, no other effects apply unless specifically noted. In the case of diseases that do not inflict actual damage, Power is still used to determine other effects; if the Disease Resistance Test fails to reduce the Power to 0 (just like DV), then other effects apply.

Even if Power is reduced to 0, the character remains infected until she has made *all* of the requisite Disease Resistance Tests (see *Speed*, above). Only after the minimum number of tests have been made *and* the Power reduced to 0 is the disease defeated.

A disease's Power can escalate, as noted under *Accumulating Power*, below.

Nature

The nature of a pathogen or disease describes its type and root cause of its effects. Typical natures include viral, parasitic, fungal, bacterial, and toxin. This entry also provides a reference as to how the disease may be combated with drugs: anti-virals, anti-parasitics, antibiotics, and anti-toxins respectively (see *Pharmaceuticals*, p. 134).

Effect

The effects of pathogens are similar to those for toxins (p. 245, *SR4*), save that the times involved are different due to the continuous nature of the exposure.

- **Agony:** The character is wracked with excruciating pain that is difficult to describe. For every unresisted point of the disease's Power, the character suffers a -1 wound modifier (as if she had suffered 3 boxes of damage). If the unresisted Power of the disease exceeds the character's Willpower, she cannot speak coherently or move at more than a slow crawl.
- **Arcane Resistance:** ADS, MADS, and other exotic pathogens can be extremely difficult to cure by magical means, since they drain energy from the victim. Double the infection's Power rating when determining the DV for the Cure Disease Spell (p. 200, *SR4*). Spells like Prophylaxis (p. 200, *SR4*) add only half their dice (round down) to the Disease Resistance Test.
- **Blindness:** Several particularly nasty diseases can result in blindness. Depending on the nature of the affliction, this state may be temporary and clear up after the disease has peaked or cause permanent damage (requiring transplant surgery or implantation to correct).
- **Disorientation:** The target suffers a -2 dice pool modifier to all physical actions if the pathogen's Power has not been reduced to 0.
- **Malaise:** This effect groups a number of different symptoms and effects that translate into various physical maladies and potential distractions and inconveniences such as diarrhea, tremors, rashes, etc. Apply a -1 dice pool modifier to all physical actions if the current Power is less than the victim's Body, or a -2 modifier if it is higher.
- **Nausea:** If the current unresisted Power of the disease exceeds the target's Willpower, she is incapacitated for 3 Combat Turns out of every 6 Combat Turns (she is incapacitated half the time). So long as there is one unresisted Power of the disease, the character suffers double wound modifiers.

- **Paralysis:** Any time the disease's Power is not reduced to 0, she suffers a -2 dice pool modifier on all physical actions. If the unresisted Power of the disease exceeds the character's Reaction, she is paralyzed until she recovers.
- **Physical Damage:** Physical damage from diseases may manifest in a number of different ways from hemorrhaging to cell damage to embolisms.
- **Stun Damage:** Stun damage from diseases can reflect migraines, exhaustion, choking, cramps, general soreness, and a number of other symptoms.

THE DISEASE RESISTANCE TEST

The victim makes a resistance test using Body + the rating of any protective systems, implants, or medicines. Every hit reduces the disease's Power by 1 point. If the Power is reduced to zero, the disease takes no effect; otherwise apply relevant effects depending on the remaining Power rating.

If the pathogen's Power is not reduced to zero, it is added to the pathogen's Power when rolling the next subsequent Disease Resistance Test. This accumulation continues only for a number of resistance tests as listed in parentheses after the Speed in the pathogen description. After the minimum number of tests have been made, the infection has peaked, and Power will no longer accumulate. The effects of the disease will continue until subsequent resistance tests finally reduce its Power to zero.

The application of pharmaceuticals (p. 134) may assist in resisting diseases.

Disease Recovery

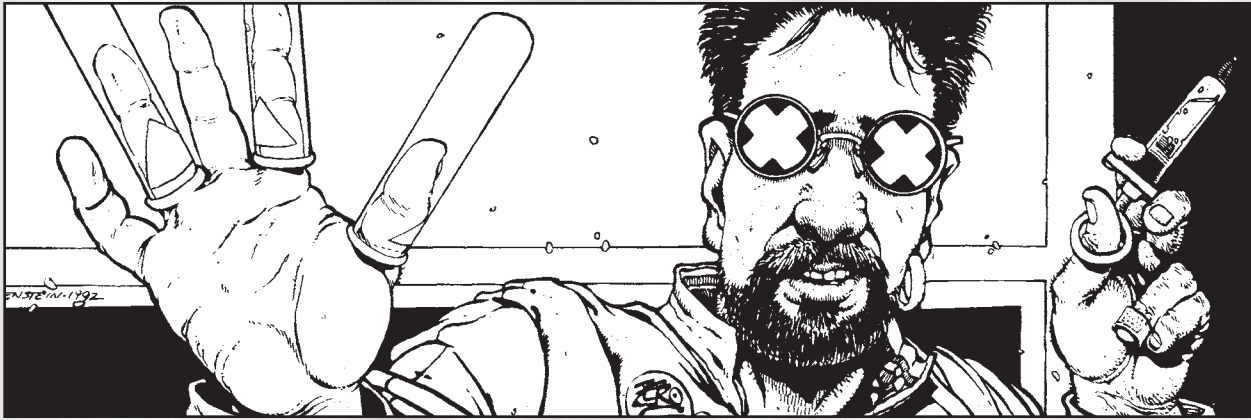
Before a character can get better, she must make the minimum number of Disease Resistance Tests, as noted by the number in parentheses listed after the Speed. If the Power of the disease has not been reduced to zero by the last test, the character must make further Disease Resistance Tests at the same interval until the Power is reduced to zero—however, Power no longer accumulates during these tests. When the character has made the minimum number of Resistance Tests and the Power of the disease is reduced to zero, she is free of the disease. With a long running illness, it is possible to get better and worse many times.

Chun has been on a working vacation in Asamando, and the Lagos necropolis hasn't been overly kind to him. After making a particularly poor choice amongst the local culinary options, Chun (Body 2) has come down with a case of botulism. The onset catches Chun by surprise 6 hours later, when he has to make a Disease Resistance Test. Chun rolls no hits and suffers the debilitating effects of botulism at Power 4: malaise, nausea, and paralysis.

At this point, Chun is in a bad way. This is not enough to paralyze him (Chun's Reaction of 4 is not exceeded), or to incapacitate him with nausea (Chun's Willpower of 5 is not exceeded), but it's pretty close. With crippling agony and a potentially fatal infection on his hands, Chun picks up some strong antibiotics (Rating 6). The next time the botulism takes effect, he is benefiting from them, rolling 6 extra dice on his resistance rest.

At the second test (12 hours after infection), Chun rolls his 8 resistance dice and gets 3 hits. Unfortunately





the Power of the disease is 8 for this test (Power 4 plus the unresisted Power 4 from the first test), which means that Chun only reduces it to 5. Unfortunately, this now exceeds Chun's Reaction and he is paralyzed. He collapses in the corner and has no choice but to hope for the best and let the disease run its course.

After the botulism's Speed runs out (the third minimum test) again in 6 hours, Chun makes another resistance test, rolling 8 dice thanks to the antibiotics again. He gets another 3 hits, but the botulism is now peaking and its accumulated power is 9 (Power 4 + unresisted Power 5 from the last test). He only reduces it to 6, which exceeds his Willpower, so Chun spends the next 6 hours paralyzed and in crippling nausea. The disease has now run its course, though, and all that is left is recovery.

On the next test, Chun only gets 2 hits, but he's only facing Power 6 now, so he reduces it to 4. He's no longer paralyzed and is back on his feet, if still sick. In another 6 hours he makes a final test, getting 4 hits, reducing the remaining Power to 0, and finally kicking the disease.

MAGICAL DISEASES

The world of 2071 boasts a plethora of Awakened bacteria and viruses, of which there are uncounted millions that are capable of causing disease in metahumans. Many magical diseases are retroviruses that incorporate their genome into the host's own, leading to sometimes massive genetic shift that can cause gradual transformation of the host organism over time. Still others develop from Awakened bacteria.

Perhaps the most famous of these viruses is the Human-Metahuman Vampiric Virus (HMHVV) and its many variants. Many unrelated magical viruses are detectable with the *Harz-Greenbaum* blood series, but anti-virals capable of handling magical strains are few and far between. Magical bacteria are, generally speaking, vulnerable to antibiotics.

Aura Deficiency Syndrome (ADS) and Mana-Active Aura Deficiency Syndrome (MADS), presented below, can be treated in the same manner as normal, non-awakened viral pathogens. Rules for HMHVV and its variants will be covered in detail in upcoming products.

SAMPLE DISEASES

The following diseases are presented for the gamemaster to inflict on characters as he desires.

Botulism

Vector: Ingestion

Speed: 6 hours (3)

Penetration: 0

Power: 4

Nature: Bacterial

Effect: Malaise, Nausea, Paralysis

Often called "food poisoning," the clostridium botulism bacteria is a soil-born organism that can cause vomiting and even paralysis in metahumans that consume contaminated food.

Influenza

Vector: Inhalation

Speed: 12 hours (14)

Penetration: 0

Power: 2

Nature: Viral

Effect: Stun Damage, Disorientation

The flu causes fatigue, muscular aches, stomach distress, and a runny nose. It is an extremely common viral affliction, in no small part because it mutates extremely quickly. Particularly deadly strains of influenza appear intermittently, and have made death tolls as large as any disease in history. These outbreaks of deadly influenza have an increased Power (6)—were one to happen again, the results might be catastrophic.

HSV-5

Vector: Contact, Injection

Speed: 1 month (currently incurable)

Penetration: 1

Power: 5

Nature: Viral

Effect: Stun Damage, Agony, Malaise

A predominantly sexually transmitted disease, the Herpes Simplex Virus-5 causes monthly eruptions of bleeding sores that have gotten it nicknamed "the male period" in spite of the fact that it effects men and women equally. Because the flare-ups are so far apart, HSV-5 is rarely life threatening as victims have

usually fully recovered from the last flare-up by the time a new flare-up begins. There is currently no commercially available cure for HSV-5, though several corporations have treatments on the market that substantially reduce bleeding. Carriers are contagious whether they have current sores or not.

Malaria

Vector: Injection

Speed: 3 days (8)

Penetration: 0

Power: 3

Nature: Parasitic

Effect: Physical Damage, Malaise, Nausea

Malaria is a microscopic blood-borne parasite that is transmitted from host to host by larger parasites. Worldwide, the biggest vector of malaria is mosquitoes, but some tropical regions have even larger problems such as the Amazonian flying candiru or the African harpoon leech. Malaria is curable, but remains the fifth biggest killer on the planet. Symptoms include fever, nausea, and muscle aches. Destruction of blood cells by the plasmodium can lead to jaundice or death.

TLE-x

Vector: Special

Speed: See Description

Penetration: 0

Power: 5

Nature: Degenerative neural condition

Effect: Stun Damage, Disorientation, Paralysis

Technically not a pathogen, temporal lobe epilepsy with complications is a chronic and degenerative neurological disorder resulting from extended neurological and metabolic stress (typically the result of excessive cyberware implantation, especially move-by-wire implants) and as such follows much the same rules. If a character develops TLE-x, she does not manifest symptoms immediately; instead, she becomes subject to acute epileptic seizures in stressful situations. When in appropriately stressful circumstances, the gamemaster may call the TLE-x victim to make a Body + Willpower (3) Test. If the test fails, the character suffers a seizure, and the “disease” effects above kick in.

Initial onset may be resisted by a pharmaceutical cocktail known as AEXD (see *Biomedicals* below), but after onset TLE-x can only be treated via corrective gene therapy (p. 88) or brain surgery (threshold of 20 and a DV of 7P)—though in both cases it may return if the cause is not removed.

Tuberculosis

Vector: Inhalation

Speed: 1 week (currently incurable)

Penetration: -3

Power: 3

Nature: Bacterial

Effect: Physical Damage, Nausea

Tuberculosis is an airborne disease that spreads and kills slowly and relentlessly. Once seemingly beaten with antibiotic treatments, the tuberculosis of 2070 is back as a world killer. Antibiotic-resistant strains are the rule, and there is little that can be done to remove an infection once in place. Still, it is relatively

difficult to catch, as six months of frequent close contact with the infected carries only a 50 percent chance of it taking root in the lungs. The compromised lungs are slowly destroyed, leading to a wasted condition of the entire body.

VITAS-3

Vector: Inhalation

Speed: 12 hours (4)

Penetration: -2

Power: 6

Nature: Viral

Effect: Stun Damage (converts to Physical when track exceeded), Malaise, Nausea

An aerosolized strain of one of the deadliest viral plagues ever to strike mankind. VITAS-3 outbreaks are normally contained only by the fact that victims often lose consciousness from the intense bouts of coughing, fever, and vomiting the infection causes. Mortality is about 50 percent among humans.

Aura Deficiency Syndrome (ADS)

Vector: Contact

Speed: 1 day (3)

Penetration: 0

Power: 4

Nature: Viral

Effect: Arcane Resistance, Aura Deficiency (see below), Nausea

This viral infection is spread by physical contact with a disease carrier. The disease reduces an infected subject's dice pool for any Magic-linked skill tests and any dice pools used to determine the effects of an adept or critter's powers by its total accumulated Power (for the duration of the infection). ADS (and MADS) pathology is clearly visible in the aura of the victim on an Astral Perception + Intuition (1) Test.

Mana-Active Aura Deficiency Syndrome (MADS)

Vector: Contact, Assensing

Speed: 1 day (6)

Penetration: 0

Power: 3

Nature: Viral

Effect: Arcane Resistance, Aura Deficiency (see below), Magic Loss (see below), Nausea

This is a rare viral infection similar to ADS, but spreads only via direct contact between dual-natured beings, including astrally perceiving characters. If the character becomes infected, the pathogen reduces the dice pool for any Magic-linked skill tests and any tests performed to determine the result of adept or critter power use by its total non-resisted and accumulated Power. If, however, that accumulated Power ever exceeds twice the character's Magic rating, he loses use of all magical abilities. Paranormal critters and sapient dual-natured beings (such as ghouls or vampires) that reach this stage of the disease sicken and die.

BIOWARFARE AGENTS

Strictly prohibited by the international and intercorporate Copenhagen Accords, weaponized biological agents still surface in a troubling variety of places in the Sixth World. Whether stockpiled as a last ditch deterrent, employed as a lethal secu-





INCOMING FEED.....



ADVANCED MEOTECH

rity measure, or a terror weapon, these dangerous pathogens pose unique threats to those that encounter them.

Weaponized biological agents can include prions, microorganisms (viruses, bacteria, and fungi), and some unicellular and multicellular organisms and their associated toxins. Genetically-engineered weaponized variants of natural pathogens are generally harder to combat with normal medicine and are designed to be more effective than their precursors. All have the ability to adversely affect metahuman health in a variety of ways, ranging from mild allergic reactions to serious medical conditions, even death. Such pathogens can often be replicated quickly and easily.

The ideal biowarfare agent boasts high infectivity, high potency, targeted delivery or contagion, and an aerosol vector. In most cases, designers possess a vaccine or treatment procedure to cure the disease the agents create as a security measure or to press the opposition into negotiations or capitulation.

Note that biological warfare goes far beyond targeting metahumans. Agricultural warfare specifically targets plants to destroy crops or defoliate vegetation. Such “scorched earth” tactics are just the next step in a strategy proven throughout history.

The use of genetically modified pathogens and bioagents is one of the more dangerous applications of modern genetics. Unfortunately, it is more widespread than most people believe. Shadowrunners may encounter these dangerous bioagents in a number of scenarios, since corporate forces, radical political groups, and extremists of all stripes might possess such weapons in their arsenals. The following represent a selection of different

bioweapons characters might wish to avoid. Besides the possible counters, vaccines and treatments exist for all the following.

Bedlam (numerous variants)

Vector: Injection

Speed: 3 days (3)

Penetration: 1

Power: 6

Nature: Toxin

Effect: Agony, Attribute Debilitation (see below)

Not a viral or bacterial agent, bedlams encompass several different artificial biotoxins that use tissue-specific antibodies fused with a radio-nucleotide to cause debilitating damage to targeted regions via radiation. The best known bedlam-variant is *Doom*, which targets and destroys muscle tissue (Strength) by introducing bismuth-212 into the muscle. Other variants of bedlams exist, targeting neurons (*Burnout*: Logic or Intuition), organs (*Carnage*: Body), or skin (*Ravage*: Charisma). In all cases, following each Disease Resistance Test, subtract one point from the relevant attribute if the Power of the disease is not reduced to zero, to a minimum of 1 per attribute. Attribute points lost in this manner can only be restored by augmented healing gene therapy or normal character advancement.

Bedlam is immune to all biomedicals and all toxin-protecting agents and cyber- or bioware. Outside a full-term augmented healing gene treatment, only nanite O-cells (p. 110) and binder (p. 135) are capable of fighting bedlam variants.

Croisade (*Visceral Ipsvorosis*)

Vector: Inhalation

Speed: 2 days (20)

Penetration: 2

Power: 4

Nature: Viral

Effect: Agony, Self-Devouring (see below)

Croisade is a viral pathogen that mimics the pathophysiology of gastroenteritis. It infects the host's immune cells (lymphocytes) and reprograms them to recognize the host's own tissue as foreign, leading to systemic inflammatory autoimmune responses as the body begins to devour itself. This leads to organ failure, internal bleeding, and cardio-vascular shock—and the death of the victim.

If a character becomes infected, subtract one point of Body every time the Disease Resistance Test doesn't reduce the Power to zero. Further resistance tests must be performed with the reduced Body attribute. If the Body reaches zero, the character dies due to systemic damage. Even if the character survives, Body lost in that manner can only be regained by augmented healing gene therapy or character advancement. Croisade is only partially vulnerable to anti-virals (these grant half their normal bonus).

Ebola Plus (*Ebola virus strain 74B-3*)

Vector: Contact, Inhalation

Speed: 1 day (6)

Penetration: 0

Power: 8

Nature: Viral

Effect: Physical Damage, Agony, Nausea

Ebola plus or strain 74B-3 is a fast-acting and spreading variant of the ebola hemorrhagic fever virus. Strain 74B-3 causes internal cell necrosis and major internal and external bleeding. Unlike previous strains, it spreads as easily by air as by physical contact—giving it the potential to cause pandemic infections.

If infected, a character continues to take damage until he dies or recovers (if aided by biomedical). Zeta-inferon (p. 135) is effective against Strain 74B-3, but only at half its rating. The most effective agent against ebola plus—if the disease is diagnosed early enough—is a specially engineered antiviral that immediately halts the disease after administration, preventing further Disease Resistance Tests (such an antiviral must be procured from government or military sources).

Gamma-Anthrax (*Bacillus anthracis strain gamma*)

Vector: Contact, Inhalation, Ingestion

Speed: 1 day (5)

Penetration: 0

Power: 8

Nature: Viral

Effect: Physical Damage, Nausea

An engineered variant of the naturally-occurring *Bacillus anthracis*, gamma-anthrax progresses much quicker than its ancestor, making it harder to treat. Respiratory infection causes flu-like symptoms within a day. In contrast to normal anthrax, the victim's condition severely deteriorates within hours after the first symptoms, causing abrupt respiratory failure and death.

If a character becomes infected, the course of the disease aggravates if not treated quickly. Each time the disease has to be resisted, add +1 to the basic Power of the disease, no matter if Power was reduced to zero.

Timebomb (*Neurospora maligna*)

Vector: Inhalation

Speed: 12 hours (5)

Penetration: 0

Power: 3 (10*, see below)

Nature: Fungal

Effect: Physical Damage*, Nausea

A fungal infection that spreads like wildfire in the lungs, *neurospora maligna* starts with bronchitis-like symptoms, then causes respiratory failure due to mycotoxic poisoning. The first Disease Resistance Test is made against the increased Power value noted in parentheses to determine infection. No damage is done at this point. After that, the disease develops with a Power of 3 and thus is easily resisted, causing no Physical damage. After the third resistance test, the pathogen suddenly releases the mycotoxin, leading to an increase of the Power level, which must be then resisted, causing Physical damage. *Neurospora maligna* is immune to all biomedical except antibac, which is effective at half its rating. Nanite O-cells (p. 110) can be used to fight a *neurospora maligna* infection.

PHARMACEUTICALS AND BIOMEDICALS

The science of medicine also involves the use of pharmacological assistance to bolster the body's defenses and/or combat infections. The resources at the disposal of pharmacopeia in the twenty-first century have never been so great. Furthermore, traditional pharmaceuticals are bolstered by biomedical, as the various products of medical nanotech and genotech are known.

Whether specific diseases or pathogens are viral, bacteriological, or other is noted in the disease's description.

General Purpose Pharmaceuticals

The *Shadowrun* rules simplify pharmacological drugs into four types, noted below. Pharmaceuticals are available in a variety of forms from pills to injectable solutions to patches. Medkits come equipped with 2 doses of each type at ratings equal to the medkit's own. If the pathogen encountered is particularly virulent, exotic, or resistant, the gamemaster may opt to reduce the effects of pharmaceuticals to half their ratings (round up):

- **Inoculation:** An inoculation trains the subject's immune system to repulse a specific pathogen (be it viral, bacteriological, and even certain toxins). If the subject is later exposed to that disease, be it a week or five years later, he gains a dice pool bonus on all Pathogen Resistance Tests equal to its rating.
- **Antivirals:** An antiviral is a chemical or tailored cell that targets a range of viruses. Most medkits are equipped with antivirals appropriate to many common diseases and can dispense appropriate ones as soon as a diagnosis is obtained. Administration of antivirals grants the subject a dice pool bonus equal to the antiviral's rating on all Pathogen Resistance Tests to resist pathogens viral in nature.



- **Antibiotics:** Antibiotics are chemicals that hamper or destroy bacteria, and are quite successful at fighting bacterial infections. Antibiotics are broad spectrum enough that a medkit can dispense general antibiotics that are efficacious even if the type of bacterial infection is not known. Antibiotics grant the subject a positive dice pool modifier equal to the antibiotic's rating on all Pathogen Resistance Tests to resist pathogens of a bacterial nature. If a glitch is rolled, the disease has developed a resistance to those particular antibiotics and they no longer aid the character unless the dosage is increased.
- **Antiparasitics:** A number of diseases are the result of the action of parasitic microorganisms and fungi. Anti-parasitics are effective against a number of such dangers, offering a positive dice pool modifier equal to the antiparasitics' rating in any Pathogen Resistance Test to resist a parasitic or fungal infection.

Biomedicals

Biomedicals are potent and expensive pharmacological compounds—some chemical, some biological—that have in common the fact that they are all synthesized *in vitro* and administered only when required. Effectively superdrugs, all biomedicals may be applied before, during, or after exposure to the toxin or infection. None of the agents aid in actually healing damage caused by the affliction, instead helping halt the progression of the disease. Standard medkits do not carry biomedical, though professional paramedic ones may.

Biomedicals that work against common bacterial and viral infections, as well as common toxins (i.e., as modern antidotes against various snake poisons), are available in pharmacies or via online stores, but are prescription drugs. They are often used in tandem with other normal drugs (and effects are cumulative).

Unlike standard pharmacopeia, biomedical are potent enough that they may have debilitating side effects. Following administration of the biomedical, the character suffers a DV of 4S, resisted with Body, regardless of how effective the agent is.

Exotic or multi-resistant strains as well as designed pathogens are often less susceptible to biomedical therapies (at the gamemaster's discretion these may simply not work).

- **AEXD:** This is a powerful antiepileptic and neural facilitator cocktail developed specifically to combat the onset of TLE-x degenerative neurological disorder (p. 132). If taken every week by a potential TLE-x victim, AEXD adds 3 dice to the character's Body + Willpower dice pool to resist developing TLE-x.
- **Antibac:** This biomed protects against diseases caused by bacterial infections and bacteriological toxins, even if they have been administered as a biotoxin (e.g., as a bioweapon). If administered after initial exposure but before the pathogen's Speed period has elapsed, antibac renders the character immune to that particular infection (for 24 hours). If administered after Speed has elapsed, antibac halves the Power of the bacterial pathogen (round down) for the purpose of the Disease Resistance Test.
- **Binder:** Each type of binder biomed protects against a *specific* toxin (chosen when purchased). It is generally more effective against compounds than the broad spectrum standard antidote patch (p. 330, *SR4*), which must be taken prior to toxin exposure and is less effective against exotic toxins that don't possess a natural antidote (gamemaster's discretion).

If applied *prior* to exposure or before the toxin's Speed has passed, binder provides temporary immunity (1 hour) against the toxin's effects by binding to and thereby neutralizing it before it can do damage. If administered after the toxin has taken effect, binder reduces the power of the disease by half (round down).

While binder variants are available against most common toxins, versions effective against new, exotic, or rare toxins are often hard to acquire—increase availability by +6 in such cases. Though binder can be produced that targets neurotoxins and specific endotoxins (often as bioweapons), these are usually too fast acting for binder to counter. If taken prior to exposure, though, it reduces the Power of the neurotoxin by half; application after exposure has no effect.

- **Zeta-Interferon:** This is a powerful anti-viral agent that supercharges the character's immune system to fight disease. Zeta-interferon uses the same game mechanics as for antibac, though it only counters viral pathogens.



Pharmaceuticals	Availability	Cost
Inoculation (Rating 1–6)	—	Rating x 50Y
Antivirals (Rating 1–6)	—	Rating x 20Y
Antibiotics (Rating 1–6)	—	Rating x 10Y
Antiparasitics (Rating 1–6)	—	Rating x 25Y

Biomedicals	Availability	Cost
AEXD	8	500Y
Antibac	7	600Y
Binder 8	(14)	750Y
Zeta-Interferon	9	800Y



Hardcase ran as fast as his augmented muscles would allow, tendons pumping with the effort. He knew he wouldn't be fast enough—the hounds chasing his sorry ass would catch up to him before he reached the LZ. He clutched the sample case closer to his chest, keeping its valuable contents from jostling or falling out of his jacket.

The street samurai remembered hearing that dumb troll Krog's bellows and the staccato reports from his heavy pistols, but he hadn't turned to help. He'd just run. If the others weren't dead already, they soon would be.

Hardcase broke out of the thin forest surrounding the lab complex and charged for the low wooded hills beyond. If he could get across that stretch of open ground before the hunter-killers broke out of the tree line, he might just be all right.

He realized his mistake immediately. He was out in the open. The dogs had coaxed him in this direction and flushed him out of cover. How the fuck had they done that?

He was barely halfway when the dogs came crashing out of the woods. Once those beasties hit open ground, they soared and were on him in seconds. One ripped at his arm, tearing his gun from his grip. The others fanned out, circling him rather than attacking.

Hardcase stopped and fell back into a protective stance, popping a spur. As the dogs circled, his attention focused on their rippling augmented muscles, matte-black dermal sheaths, and gleaming razor claws. He vaguely registered how the dogs moved as one.

Two of the mutts kept their distance a little ahead and behind him, in case he decided to make a break for it. When the others came, they pounced from opposite directions. The first hound darted out of range as he swung his spur, exposing his side to the chromed teeth of the other dog.

Something was wrong. This wasn't how guard dogs acted. This wasn't familiarity honed with practice, but a single mind, a single purpose. Hardcase knew metahuman-level intelligence when he saw it—that meant biodrones!

He fought them off as best he could, but one man against half a dozen hunter-killers didn't make for much of a fight. His legs finally buckled and six sets of jaws dug into his flesh.

Over his screams and their disgusting sounds of mayhem, Hardcase heard the whine of engines and felt a strong wind buffet him and the dogs. Heavy reports of mounted weapons and that familiar staccato rhythm reached his ears. He felt the dogs get knocked off his body; heard them scatter.

He couldn't move, but managed to crack open the one eye the dogs hadn't ravaged. He saw the most beautiful thing he'd ever seen in all his thirty-odd years—a helo transport hovering nearby, its running lights and machineguns flashing in the dusk. Framed in the open hatch was Krog, good ol' Krog, firing several rounds toward the trees, presumably toward the remaining hunter-killers.

Krog leaped out, moving quickly over to the downed samurai. The troll looked down.

"You've seen better days, Hardman."



- There's no closing Pandora's box—the march of progress is relentless. Every day, corporate tech wizards conjure up some new frankenstein creation, some mad mixture of hard science and dark nightmares. Sometimes, just sometimes, don't you just wish they would stop finding new stuff to throw at us? Nephrine, Bandit, and Glitch have put together the following primers on the latest batch of menaces manufactured by those geniuses in the R&D—biodrones and cyborgs—as well as an update on that old favorite, cybermancy. Feel free to update this file with new developments as you come across them.
- FastJack

BIODRONES

Posted By: Nephrine

It's time to bring you up to speed on the latest trend in corporate security, and possibly one of the most disturbing developments in a while: *biodrones*. More than mere cybered guardians, these augmented animals can be controlled by a rigger just like a mechanical drone can, while making full use of their natural instincts and abilities. If that cybermutt you're facing down looks like he's acting on more than animal intelligence, be careful—he just might be.

For as long as (meta)humanity has been around, we've found uses for the animals we share the world with as food, raw materials, labor, guards, and as companions. To this purpose, various species have been domesticated and bred for certain traits over generations. Toward the end of the last century, militaries began to seriously investigate new ways to employ our trusty animal companions—as chem sniffers, mine seekers, and suicidal fighters. Also at the turn of the last century, thanks to genengineering, “breeding” could suddenly progress much faster and desirable traits could be spliced directly into animals. The advent of cybernetics took this a step further, allowing owners to modify animals to their designs—though many animals respond even worse than metahumans to excessive implantation.

While there have been huge advances, the greatest hurdle in using animals for security and warfare has always been that appropriate training is arduous and time-consuming and control over the animal has always been limited—particularly when compared to drone tech. The brain trust has never stopped trying, however, because while the ever-evolving capabilities of drones and robots are impressive, most animal's basic and natural instincts, senses, cunning, and innate abilities remain largely unrivalled by technology.

First came cyber- and bio-enhanced guard animals, then enhanced paracritters, and now full blown biodrones. Technology has finally progressed far enough that primal behavior can be overridden, senses fully accessed, and the full potential of the animal can be tapped. The first generation of these biodrones can already be found in a host of surveillance, security and military roles, and some are even finding their way down to the shadows.

- Is it just me, or is anyone else disgusted with this perversion of nature? It wasn't enough, making animals into mutants and 'borgs—now they're taking away their minds?
- Ecotope

- You worry about how the big bad man is raping Mommy Nature's little babies. I'll worry about what the little freaks will be able to do to my ass.
- Hard Exit

I picked up the following document recently from Parashield's corporate client node; read it and weep. Your runs just got a little more complicated.

```
// upload uniformat text attachment :: user Nephrine ::
08/02/70 //
MENAGERIE™ BIODRONE SERIES
(Customer Prospectus)
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The brilliant minds at Parashield have combined state of the art developments in genetics, biotech, and animal cybertechnologies to bring you a radical and innovative new solution to your security and surveillance needs. Parashield proudly presents our *Menagerie* biodrone series.

Combining innovations in various fields, our revolutionary new product line boasts the reliability and versatility of hard-tech drones with an augmented animal's cunning, heightened senses, and innate abilities—all in a low-maintenance, highest-quality biological platform.

Further, our *Menagerie* series allows full integration of the biodrone into a standard drone network. We offer your security specialist not only the ability to tap into the animal's full sensorium (including augmented or artificial senses provided by cyberware and bioware), but also varying degrees of direct and indirect control of the animal—up to and including our ground-breaking *C-Puppet* system, which allows full-immersive rigger control.

While the *Menagerie* series offers a comprehensive selection of ready-to-field surveillance and security biodrones, individual units can be customized to our clients' specific needs in mere days. Our consultants guarantee complete onsite integration with your established security apparatus, and can even offer suggestions on optimizing resources.

- How callous to call them “units.” These *are* animals aren't they? Living beings? It just goes to show how even the brightest metahuman minds can be so lacking in empathy, or so blinded by money or ideals of progress. If the technology has come this far, you have to wonder when they'll start implementing it in other metahumans as well.
- Icarus
- Who's to say they haven't? Check out the files Bandit and Glitch added below.
- Plan 9
- No need to point out these things are sterilized before being fielded I suppose.
- The Smiling Bandit.
- Parashield is at the bleeding edge here. It's no wonder, considering they have the training and the breeding installations and their mother corp Mitsuhama is providing them with the latest tech from their robot-forges.
- Glitch



- Actually Shiawase Biotech is offering a lot of the same deals and also working on custom-grown biodrones for military and espionage applications. Ares Arms, Biogene (Yakashima), and UniOmni, on the other hand, have sunk considerable nuyen into fully genengineered “warforms.” Nobody really knows how far along these combat biodrones are, though, since they’ve yet to be fielded.

- Black Mamba

- Or no one’s survived an encounter with them to bring home intel ...

- Picador

OUR TECHNOLOGY

A pioneer in the field of biodrone technology, Parashield combines vat-growth integration (VGI), computer-assisted sensory translation (CAST) implants, and conventional augmentation in the creation of our state-of-the-art units. The latter is ideal when creating specialized biodrones and is substantially cheaper than VGI. Vat-growth integration, however, is the economic answer for clients requiring a large number of biodrones with similar performance specifications.

Vat-Growth Integration (VGI)

The vat-growth integration technique is the current industry standard, making production of large numbers of drones with a relatively brief growth period economically viable. In this procedure, an animal zygote (genetically-modified to specifications) is artificially inseminated and grown to maturity. Nano-assisted surgery removes superfluous organs (i.e., the reproductive system, parts of the digestive system, vocal cords, and scent glands) and installs first bioware and then cyberware implants in vitro. Insects and small animals are augmented to their mission-specific configurations during this procedure,

Vat-growth integration is the preferred method for modifying insects, small reptiles, and mammals. Larger or higher-order biodrones receive only basic bio-modifications and receive further implants after being decanted and assigned.

It is currently impossible to utilize VGI to breed paranormals.

- Growing larger animals such as dogs or big cats can be just as complicated and expensive as cloning wimps. Their metabolisms are much more complex and there’s the whole hurdle of brain and neural development. All in all, it doesn’t make for particularly attractive economics.

- KAM

- VGI is going to be the key to mass production and a more widespread presence of biodrones in the coming years. Let’s hope they don’t crack the size issue any time soon.

- Kay St. Irregular

Parashield offers 10 basic VGI biodrone templates ideally suited for both urban and wilderness environments (including several rodents, felines, and insect swarms).

PARASHIELD PRODUCT CATALOG

Biodrone Templates

SkySpy

Using the ubiquitous rock pigeon (*Columba livia*) as a bio-template, this discreet surveillance biodrone comes with a default suite of *HawkEye* cams, TRACES tactical capability system, and orientation goad. The inexpensive and unobtrusive *SkySpy* is popular with law-enforcement, security, and intelligence agencies in a variety of pursuit, surveillance, and reconnaissance roles. [See Full Specs.](#)

RatEye

Taking advantage of the pervasiveness of the common black rat (*Rattus rattus*) in modern urban habitats, this biodrone is ideal for discreet perimeter security in built-up and underground areas, sewage systems, and ventilation systems. The *RatEye* biodrone can even be programmed to forage, becoming self-sustaining. The basic implant suite includes only *HawkEye* implants, orientation goad, and TRACES system, but a full CAST version is available, enabling security riggers to tap the biodrone’s impressive natural olfactory and hearing senses. [See Full Specs.](#)

Roachdrone

Sometimes the most obvious solutions are the best. After all, what is more inconspicuous than a bug? Perfect for discreet surveillance, the versatile *Roachdrone* comes equipped with composite *MicroEye* cams, *Gustavus* hearing modification, *iScent* olfactory augmentations, and an orientation goad. [See Full Specs.](#)

Computer-Assisted Sensory Translation (CAST)

Computer-assisted sensory translation (CAST) pushes biodrones far beyond the capabilities of regular drones. This technical marvel, now an industry standard, is a powerful enabling technology that circumvents the greatest obstacle in biodrone development—the inability of traditional simsense interfaces and the metahuman mind to process an animal’s raw senses.

CAST tackles this problem by tapping not the sensory organs, but the sensory centers of the animal’s cortex. Identifying sensory stimuli in the brain, a CAST unit reads and translates activity into comprehensible simsense data; allowing a rigger to perceive the environment much like the critter would. This technique even allows the system to translate senses that metahumans normally do not possess—like dramatically enhanced hearing or sense of smell, or completely exotic senses such as a migratory bird’s direction sense or a shark’s electromagnetic sense—transforming them into data comprehensible to riggers.

Furthermore, CAST functions as a control mechanism, allowing preprogrammed sensory stimuli to be fed to the critter’s mind. This grants a handler greater control, enabling him to project associations into the critter’s brain that trigger appropriate behavior when a threat is identified.

THE CUTTING EDGE



INCOMING FEED.....



- CAST translations can produce some funky results. I test drove a biodrone dog the other day, and the range of smells those buggers have is so large it gets translated into translucent color fields for easier metahuman processing.

- Rigger X

- There are limitations to the system. Higher-order brains make CAST translation incrementally harder if not impossible, since complex neural structures link a lot of subconscious processing and memory associations with sensory stimuli. For example, applying CAST to a shark is fairly simple. Even though there are a multitude of highly-developed senses, the brain that processes the perceptions is very simple, and thus it is not hard to translate the total perception into a signal. Same for reptiles, birds, small mammals, and bugs.

- The Smiling Bandit

- And what about paracritters? I don't want to think about a rigged hellhound with astral sight.

- Jimmy No

- That's still far ahead of the curve. Astral perception and similar abilities have yet to be linked to a specific part of the brain. There are people working on it, no doubt, but any biodrone with this capacity would be a fluke and almost priceless.

- KAM

Augmentations

Our *Menagerie* series offers the full range of bioware and cyberware modifications available to Parashield's basic augmented guard animals, as well as a number of systems unique to our biodrones. Bio- and cyber-customization to client needs is an integral part of our service. Our units may also be tailored through genetic modification (extending delivery times and overall costs). Units already integrate a number of genetic enhancements, though more uncommon or exotic abilities may be implemented.

Please refer to your local Parashield customer liaison for more information on specific systems and unit costs.

Swarm Technology

One of the first applications of VGI was the fabrication of augmented insects. VGI can readily produce thousands of specimens once the procedure is set up, and since insects reach maturity very fast, the batch turn-around is low and thousands of insects can be produced in a day.

The insects produced in this fashion are typically very specialized; all excess organs are removed and only mission-critical equipment is added. The lifetime of a swarm is typically under an hour; the insects' metabolic activity is suppressed chemically until the swarm is deployed. By eliminating the need for a digestive tract, space is freed up that can be used for other equipment. Every member of a swarm typically is equipped with a primitive processor and a transmitter that the swarm uses to create a distributed computing network between its members, giving it a substantially

higher intelligence than would be possible with any processor that fits into an insect. Biodrone swarms are currently being fielded as mobile sensory phalanxes ([Sensor Swarm VI](#)) and other more exotic roles are in development.

CONTROL OPTIONS

Parashield offers clients a variety of biodrone control options, ranging from indirect mechanisms such as behavioral modification and biological leashes to control rig-compatible cybernetic suites. Control methods can be further tailored to accommodate almost any security solution or apparatus—though direct control methods are undoubtedly the key to biodrone optimal performance. To optimize integration of biodrones in security apparatuses, it is highly advisable that the unit possess some degree of cybernetic sensors. Our control options are compatible with the vast majority of existing animal bio- and cyberware enhancements on the market.

Response Conditioning

For the simplest of biodrones, we offer animal response conditioning methods that are standard in our augmented guard animals. These include specialized handler training and various *indirect* control methods. To this end, Parashield has patented a bioengineered toxoplasma variant, exclusive psychotropic conditioning, simsense training, and behavior modification courses. These can be implemented in traditional guard animals, augmented animals, and biodrones, and significantly increase the units' response to commands and directions from their handlers.

- FYI, toxoplasma is a naturally-occurring parasite that reproduces sexually in cat intestines, but can reproduce asexually in other organisms, such as rats. To insure that sexual reproduction occurs, the toxoplasma overrides inhibitions, fight or flight mechanisms, and the sense of self-preservation in the rat, making it seek out cat urine trails, and reducing the rat's fear of cats. I can see how this might work—interesting approach, I must admit. Simsense conditioning has been used on animals for the better part of twenty years now, with varying results.
- KAM

Orientation Goad

The most economical method of *direct* control is a simple cyberimplant that “destabilizes” the biodrone's orientation by changing the balance of the inner ear. The biodrone reacts instinctively to the change, by turning, moving forward or backward, or up or down. Thus, the direction in which the drone moves can be crudely controlled by a security rigger. The goad comes with an integral wi-fi microtransceiver with a range of 100 meters.

While this system is not optimized for combat, orientation goads are the ideal method of control for discreet recon and surveillance biodrones, such as cyber-augmented insects or birds (such as the [RECondor](#)). This minute implant has the added benefit of being less invasive than our advanced control systems, and consequently implanted animals show less signs of aggressive behavior and psychological trauma.

PARASHIELD PRODUCT CATALOG

Biodrone Templates

RECondor

Perfect for wilderness or rural security and surveillance, the *RECondor* uses the Californian condor as a biological template. The biodrone is fitted with an array of sensory enhancements, an orientation goad, and a commlink, and may add a TRACES system. [See Full Specs.](#)

Razorhound

Man's best friend has just gotten better. Based on Parashield's hugely successful Cybermutt-3000 augmented guard dog, the *Razorhound* boasts a full stirrup interface, SEI system, and a mounted taser unit to neutralize larger targets, in addition to the C-3000's already impressive array of cybernetic weaponry. [See Full Specs.](#)

Sensor Swarm VI

Devised to facilitate explosive detection and neutralization, the *Sensor Swarm VI* uses the bio-enhanced olfactory senses of a 100-strong swarm of bees to quickly and efficiently scout large areas for hidden explosives, bombs, and traps. Though still restricted to accredited security agencies and service providers, a civilian version is currently in development. [See Full Specs.](#)

CAST

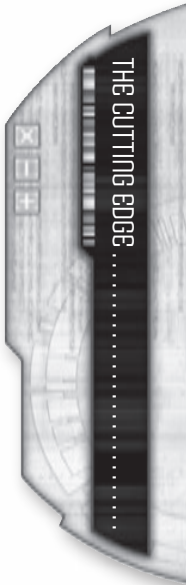
Our standard biodrone control system, combining behavioral modification and a CAST cyberimplant, is relatively cheap and accessible and may be fitted to any augmented guard creature, converting it into a biodrone. The CAST system, installed in the biodrone's cortex, allows the biodrone to transmit real-time sensory and rigging information feeds. It also processes wireless commands from the handler into a set of basic stimuli and emotional cues the animal is instinctively familiar with. The system may even be programmed to activate certain cues based on simple vocal commands.

An advanced CAST package, available on demand, expands the CAST system with a friend-or-foe recognition system.

Stirrup Interface

Our most advanced control method uses sophisticated move-by-wire technology to ensure direct control. Known as a stirrup interface, it includes rigger control adaptation. This extraordinary system allows full sensory immersion and rigger control of the biodrone and also enhances the unit's reflexes and motion control significantly. Clients are warned, however, that the technology is expensive and not suited for large scale application.

- They don't say it, but the “stirrup system” neural replacement is so extensive that they're hard-pressed to cram any more augmentations into the animal without driving it insane.
- Nephrine



- Before anyone ignites this discussion, note that any noise of biodrone technology being applied to wimps is just that: noise. Vat-grown neural and limbic systems just don't develop to the point required.

- Butch

- Some of the weirder rumors floating around regarding Proteus before the whole thing blew up in the mid-60s held that some of their higher ups were actually "jumping jacks" who were mounted by the real brains behind the corp

- Red Anya

// end attachment //

BIODRONE APPLICATIONS

So, now that you've seen what the corps are offering, here's a brief overview of where biodrones are making an impact. Biodrone shapes and templates may vary widely, but you can boil down their applications to certain fields. Keep in mind they're still more expensive than regular drones, and rare enough that a lot of people might not realize what they're up against when they come across one.

Surveillance

The obvious, and probably the most successful application of biodrone technology, has been in intelligence, security, and law-enforcement. Recon biodrones are seeing use in covert surveillance and intelligence gathering ops and, to a lesser extent, in covert pursuit and discreet on-site security. In these roles, biodrones excel in both urban and wilderness settings.

The advantage these drones offer is that they can get into most places without being noticed; puns aside, who would expect a fly to be a bug? Implants tend to be unremarkable and are so minor that they don't call much attention to themselves in astral space at first glance; few magicians would bother scanning small animals anyway.

The simplest models typically consist of a bird, insect, or even a small mammal, implanted with an orientation goad, a video-and/or audio-recording system, and an encrypted and stealthed broadcasting system (typically short range). Most are produced using VGI.

- If done right, these things are almost undetectable. Nobody pays much attention to a bird on a wire, or a cat on a ledge. Typical giveaways are unidentified wireless traffic or hidden nodes showing up on your e-scans, but even those can be fooled if the other side is careful.

- Rigger X

Security

Destined to become the most infamous type of biodrone in our circles, combat-enabled biodrones can boast a huge variety of potentially nasty modifications and operate in a number of security roles. The most basic models are enhanced to alleviate the need for training or handlers, while others are killer combat machines with intelligence and sensory augmentations that would make a street samurai weep. Dogs, wolves, big cats, apes, sharks, and occasionally smaller pack animals are the preferred biological platforms for security roles, though the number of exotic variations on the market keeps growing.

LOS ANGELES METROBLOGGER [HORIZON]-01/27/71

LOS ANGELES: While attending the Annual Californian Environmental Summit hosted by Sierra Inc., six people were killed and thirteen others, including ex-UCAS presidential candidate and Ares Macrotechnology board member Arthur Vogel, were critically injured by an explosive device installed within a dog. Vogel was apparently the primary target of the bomb, as the former crusading eco-lawyer had just finished a speech on the importance of recognizing both technomancers and megacorporations as part of the newly emerging Sixth World ecosystem when the dog broke through the crowd and ran toward him. An anonymous source at the UCLA Medical Center, where Vogel is undergoing treatment, has said that only Vogel's dwarf physiology and his form-fitting body armor saved his life. Even still, over 40% of his body will have to be replaced. TerraFirst!, GreenWar, and the Awakened Liberation Front have all claimed responsibility for the attack. [Read More](#)

- This file has been tagged by someone on your network.

- Bullshit. There may be cells that have the technological know-how to operate a biodrone, but make one? No way.

- Ecotope

- Maybe it was liberated from a testing ground? These boys target animal pens and training grounds like those owned by Parashield or Biogene on a regular basis.

- Black Mamba

- Or maybe Damien Knight just saw an opportunity?

- Snopes

Whether supplementing standard perimeter guards or patrolling an office building by night, the biodrones come into their own when they're fully integrated into the local security apparatus and are coordinated by an onsite rigger. Combine enhanced awareness, tactical coordination, and control of the environment with an animal's natural instincts and ferociousness, and these things make for a formidable surprise.

Biodrones in security functions tend to have obvious and heavy cyber- and bio-enhancements for their intimidation factor. They're also more unstable and likely to break conditioning.

- I was part of a team that conducted a run against a Shiawase research installation a while ago. What we didn't know was that it was guarded by an early-generation cybertooth tiger, one of their high-end combat biodrones. It must have been patched into the security video feeds and lighting systems, so not only did it know where we were at all times, but it could also set up perfect ambush conditions.

Urgent Message ...



It was so fast and quiet, striking like a ghost in a heartbeat. We lost over half the team, and to this day I'm edgy around cats.

- Beaker

Military

If you thought the combat biodrones you see in security functions were frightening, some of the miltech versions will have you crapping your pants. Biodrones were first fielded in military roles, so it serves to reason that the next generation will be coming from this arena too.

First up are combat biodrones decked out with milspec weaponry and sensors. Much rarer than normal drones on the battlefield, they've proven popular among some armed forces (such as the Sioux and Aztlan) for their psychological impact.

Next up are the first generation of *warforms*—bio-engineered chimera armed to the hilt and combining useful traits from various species. Still highly unstable from all accounts, only a few prototypes have been rolled out and then mostly for show. Ares Arms unveiled a 250-kilo, four-armed *CyGor* biodrone prototype at the Athens Arms Fair in December.

Bio-bombs are expendable, VGI-grown biodrones. These drones typically carry a small explosive payload and detonator, along with either a homing system or an orientation goad that directs them to their target. Payloads are typically small but designed for maximum damage, using fuel-air and more exotic explosives.

- The more advanced version of bio-bombs will synthesize their own explosive (like triacetone triperoxide) in a chemical gland once they reach their target to avoid prior detection.
- KAM
- Since we've got you on hand KAM: any truth to the rumor that the Amazonian government is bankrolling a Genesis R&D project to produce these things for border interdiction duties?
- Picador
- You should know better than to ask.
- KAM

Sports, Entertainment, and Leisure

While biodrones are cutting edge and expensive, there's already interest from the entertainment and sports industry in exploring the technology to their own ends. Augmented racing leagues, horse and dog mainly, are already looking at prototypes. A variety of other animal sports are also looking into potential developments—if prices come down a bit. I'm already getting wind of underground arena fights between rigged biodrones and metahuman vs. biodrone blood sports; inevitable I suppose, and not unexpected.

Probably the weirdest twist is rumors I've heard of corporate VPs signing out combat biodrones to take on big game hunts. I can see that catching on in some quarters—the primal thrill of hunting and all that.

- I heard something creepier, maybe a new take on an old urban legend. The story goes that some millionaire boy's club paid off a few people in the right positions and got their hands on a handful of milspec combat biodrones. Anxious to play with their new toys,

they took the things off to some god-forsaken backwater for some big game hunting. Boys will be boys, however, and they quickly found that normal game is no match for the biodrones. Looking for a true challenge, they turn to the nastiest, most dangerous and vicious prey out there: metahumanity. So watch your backs boys and girls.

- Pistons

CYBERMANCY

Posted By: Ethernaut

• It is about this time of year when I get myself a liter of cherry-flavored tequila, think of my old friend Hatchetman, and shudder. It seems like an appropriate time to bring people up to speed on cybermancy. When we first got a glimpse into the world of cybermancy in '56, we saw a science that was deadly and unstable. Today we see a maturing field of research that is dangerously close to functional. Considering the costs, I'm not sure that's an improvement. After a close encounter a couple of years back, Ethernaut developed a morbid fascination with the subject and he's the closest we've got on Jackpoint to an expert on it.

- FastJack

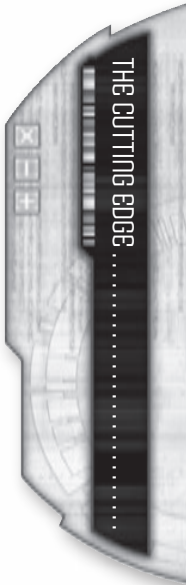
WHAT IS CYBERMANCY

Cybermancy is a common term for any of several techniques that allow a living being to go on living even after there's no reason for that to happen anymore. The labcoats define it as a multidisciplinary science that merges magical arts, advanced medical techniques, and sophisticated cybernetics. Others call it cheating death. It purportedly explores the intricate relations between body, spirit, and machine to prolong life. What it is, though, is bad news—don't let anyone tell you otherwise.

What's all the fuss, you ask? What makes this so different from the latest rejuve gene therapy or full body cybernetic replacement? Well, as any cyberdoc will tell you, the metahuman body can only suffer so much bio- and cyberware augmentation or replacement. There's a critical point beyond which the body's integrity is compromised to the point that the spirit dissipates. Beyond that threshold, the spirit just slips away as you die.

Cybermancy allows those who wield it to fool your life force into persisting, locking it into your body, when the body should by all rights be dead. How this is accomplished remains a closely guarded secret, but all indications suggest it involves the concerted effort of powerful ritual magics, metamagic techniques, and a variety of enhancement technologies.

- All this fuss over zombies?
- Beaker
- Cyberzombies, bucko. Mix 'em up at your own peril.
- Hard Exit
- Read on, young grasshopper. This isn't about spirits possessing dead bodies. This is your soul bound to your artificially sustained corpse and wired to the point "where the measure of the machine exceeds the measure of the man" as an old friend would have put it.
- FastJack



• Right. They're alive, but they *should* be dead. They're not quite one and not quite the other. It's unnatural. I'm a capable magician. I've been to metaplanes that would scare any normal person out of his wits. Believe me when I tell you I've yet to see anything as frightening as a cyberzombie's aura.

• Ethernaut

While the technology enables and sustains the subject, the core of the cybermantic process lies in the obscure metamagical techniques used and jealously guarded by those elite magical groups and orders that have unearthed them.

WHAT IT DOES

First let's look at the upsides. No longer bound by the limitation of the frail human form and sustained by arcane magic, cyberzombies can install terrifying levels of cybernetic and other enhancements. Natural aging virtually stops. The cybermantic process changes them profoundly. Cybermantic subjects become dual natured and imbued with inhuman vigor. The procedure also warps their auras permanently, polluting astral space in their vicinity and incidentally making them particularly resistant to magic. Some will tell you cybermancy makes you immortal—and, in a way, it does. For some, this promise is enough.

• Death holds little fear for those in this unnatural half-life

• Arete

• What do you expect from someone who's virtually bullet-proof, magic-proof, and utterly unemotional? I saw the remains of a rebel platoon hit by one of these things down in the Yucatan during the war. Their autofire had torn the surrounding jungle to shreds and there was no sign that they'd even hit the thing. No survivors, of course. It's no wonder the corps treat these things as one man weapons of mass destruction.

• Picador

Despite what they say, "eternal life" is not what it's chalked up to be, and the truth is far more frightening. Cybermancy binds your spirit to the failing flesh. Your body is filled with technology to sustain a semblance of life. Technomagic trickery cannot fool the soul, however—all the data I've collected suggests that some subjects see through the pretense. Something in their minds and souls understands they should be dead, and the will to live abandons them. Apathy, depression, derangements, and dementia are common, despite the chemical cocktails, implants, and spells used to counter them. Magic cannot correct this, and technology provides only temporary stop-gaps as the mind drifts and loses ever more of its identity.

If losing your mind wasn't bad enough, without the will to live, my sources tell me your body also becomes unstable: cellular mutation, tumors, physical deformities, and genetic degeneration are constant threats.

• That means regular nanotech treatments or corrective gene therapy are a necessity. Must cost a bundle in maintenance.

• Nephrine

• That's not the half of it. Figure in nutrient supplements, unique chemical cocktails, and constant check-ups, and it all adds up. The cost is one more reason cybermancy is jealously guarded by the few groups who possess the arcane techniques and the technology.

• Ethernaut

• Not quite true. The know-how has leaked, and proliferation is a real danger these days. At least ten other corps that I know of have developed some version of cybermancy. Five of those possess delta clinics, and two of them are open to outsiders with the right connections.

• The Smiling Bandit

• Yet another good reason to jump ship.

• KAM

WHERE IT COMES FROM

Part of the mystery and fear surrounding cybermancy has to do with its origins, and the fact no one seems to know exactly where it comes from. If you expected the secrecy to have lifted a little after all these years, you will be sorely disappointed. References are as cryptic as ever, and security is arctic on anything directly related to procedures and current research. Poke into Saeder-Krupp, Universal Omnitech, and NeoNET's few public files, and all you'll find is smoke and mirrors.

As far as I can tell, there's nothing solid on the true origins of cybermancy. There are claims that the cybermantic techniques used by different organizations appear similar, because the process used is in fact the same. While this may contain a grain of truth, I've only been able to backtrack a handful of techniques to very different sources and while modern cybermancy seems to be firmly in the hand of a few corporate overlords, the basic techniques are another story entirely.

The Central American Connection

To the best of my knowledge, Aztechnology was the first modern organization to create a functioning cyberzombie and remains by far the most advanced in this field. Allegedly, the basic techniques came from the obscure Aztlaner sect known as the Cult of Tezcatlipoca.

The process, heavily dependent upon blood magic, was originally very dangerous to the practitioners as well as the subjects. Every member of the initial team is believed to now be dead—the origins of the secret lore buried with them. What little has leaked of the Aztlan technique through dissidents is ominous. The blood magic powers an astral cocoon of some sort that preserves the subject's spirit from external effects—including whatever biological happenstance might render them, well, dead. Medical technology then comes in and rebuilds the subject as a new entity, and the trapped subject has no choice but to persist in that form.

Sources say that the current project reports to a feathered serpent and an eastern dragon, but many of those trained by the original team, often as not, are no longer in the employ of that corporation. Some of these expatriates have discreetly set up shop in the fortress of the Johns Hopkins Institute of Health in Haiti and in wild Caracas.





INCOMING FEED.....



- Chikoaze and Inti Jiwana call the shots now and have since Oliver McClure withdrew from the board. Before that, a fringe group of blood mages linked to the cult was allowed to run roughshod with the project. They collected a lot of data, lost a lot of test subjects, and, when the draconic duo took over, they cleaned house and kept the research data. A few “lucky” experts managed to get out in time, it appears.

- Kay St. Irregular

Aztechnology’s model has since been reverse engineered by several megacorps, though exactly how remains a mystery. Ares Macrotech got a leg up on Azzie cybermantic research somehow—I suspect their acquisition of Cross’s intelligence assets and Info-Santé may factor in to the equation. Mitsuhamu went the other way; they assembled an elaborately capable medical team at their Kyoto clinic and then extracted a team of “dissident” cybermantic technicians from Aztechnology during the project’s purges.

- That’s still awfully quick for Ares to reinvent the wheel. Did they receive outside help?

- Nephrine

- Yes.

- Sticks

The European Connection

From what I’ve been able to gather, Saeder-Krupp’s cybermantic program has been running almost as long as the Azzies’. Where their cybermantic program springs from eludes me, but it’s perfectly plausible Lofwyr himself taught company initiates the relevant techniques. What little data I’ve gathered suggests parallels to Aztech’s model, though S-K’s approach seems to use a different astral construct or matrix to cage the spirit and is fueled by some obscure metaplanar source rather than blood magic. Regardless, S-K seems to restrict the practice to very specific in-house subjects, and unlike Aztechnology there’s been no brain drain since the project’s inception.

NeoNET provides another oddity. NeoNET inherited both Novatech’s and Transys Neuronet’s cybermantic research programs and R&D has continued to pursue this project under Celedyr’s direction. What little has reached the outside world suggests they’re catching up with the major players fast.

What’s unclear is how both Novatech and Transys got their hands on the magical know-how. Both had specialized holistic magic programs and sponsored elite groups of magicians, and Transys had Celedyr. But I have the feeling I’m missing something; while it’s possible both stumbled upon it, I think it’s unlikely, and industrial espionage just seems so cliché.

- I have it on good authority that Novatech’s program dates back to its Fuchi days.

- Glitch

THE CUTTING EDGE

- That's true. Shiawase got lucky when their European office got their hands on a cybermantic-equipped delta clinic before Richard Villiers could pillage Fuchi's assets to rebuild his empire. All this talk of ghosts seems right up their alley too.

- Plan 9

- There have been rumors that NeoNET's got some sort of deal going with some secret society called the Ordo Maximus. Maybe that's been their leg up?

- Red Anya

- Coincidence you should mention that. Read on.

- Ethernaut

The African Connection

The strangest trail I followed started with Universal Omnitech. I looked into their program as best I could, called in a bunch of favors, and tracked down all the founding members of the UO's project to the Azanian Federation. Stranger still was that all three hailed from an obscure Zulu tribe, known as the Heavenherds. From that point, almost everything I dug up is hearsay and rumor, but there are claims that, exceptionally, this particular technique was originally developed not to overcome the life force threshold of implantation but to extend the existence of valued tribe members by binding them to "passions" (some kind of local mentor spirits, I believe). Interestingly, other rumors have it that the tribe regarded this magic as anathema. The only traditionally accepted use was for the temporary creation of a "great one"—which, given the lack of access to medical technology in ages past, would be very temporary indeed.

Why the tribe would share their secrets with Universal Omnitech is an even greater mystery to me. Feel free to speculate, I haven't turned up a byte of data.

- Strange that. My sources tell me both Tir Tairngire and Tír na nÓg wooed the tribe, which makes sense since the Heavenherds are apparently exclusively elven. Ethernaut's right, though, their cooperation with a megacorp doesn't add up. It seems obvious that the Heavenherds stumbled on some form of proto-cybermancy, and that their process was conceived to operate without access to modern medical care. I have it on good authority, though, that their techniques really do date back thousands of years. Make of that what you will.

- Frosty

- Do you have proof of that?

- Ethernaut

- I'm fine with pointing you in the direction of what I know, but if you want hard data, you're on your own. I suggest you think hard before pursuing such matters. The people involved here are very, very powerful. The sort of people even dragons do not cross lightly.

- Frosty

ODDS AND ENDS

Over the last couple of years, I've scrounged a lot of data, but I really struck lucky with some intel I got from a Brit runner named Valentine. His team had been hired to extract someone in transit to NeoNET's Caerleon labs, and the run went south. The mark got hit, and the team had to abandon him; they barely made it out, and all they had to show for their trouble was his personal commlink. Valentine's asking price for the full monty was far too steep for my purse, but I got a couple of gems out of the deal.

To start off, the following item was among the commlink's temp files. He was obviously still working on it, and it's unfinished, but what there is of it is ... interesting:

// upload Uniformat text file :: user Ethernaut :: 08/03/70 //
Draft1.3

To: Office of the Director of Research and Development

From: Lawrence Ellis MD, ThD

Subject: Request for reassignment.

Dear Sir,

I am taking the liberty of writing to you directly, in violation of hierarchy and protocol, to humbly request urgent reassignment. I do not take this step lightly, but I have taken the matter up with my superior on several occasions, and we have been unable to reach an agreement. Dr. Cornell insists I am irreplaceable, and while I fully understand that my combined credentials in both Neurocybernetics and Thaumaturgy make me a valuable asset to the company's efforts, I cannot, in all honesty, continue to give to this company my best when I live in abject fear, not only for my life but my very sanity.

On accepting my initial assignment to the project, I believed I understood the inherent risks in cybermantic research. The past two years, I have come to the realization that they are far greater than I (and I dare say "we") had ever contemplated.

Harrowing and traumatic though my personal experiences—and those of my colleagues—in the deep metaplanes have been, it has been the everyday toll on our minds and spirits that is causing me to despair. Only last September, we lost Martin Xiang, a valued co-worker and good friend, during the metaplanar component of a procedure. In March, Dr. James Royce had to be forcibly restrained after magically assaulting three members of his staff. I was part of the on-site evaluation team that reviewed the incident, and though we've had no further contact with Dr. Royce after he was handed over to security, our findings indicate a distinct taint to the astral signature of his workings—one I should add had not been detected before. I believe more frequent psych evaluations might have been beneficial in detecting the problem before it manifested, and I have suggested as much to Dr. Cornell—though this will only attenuate the psychological hardships and stresses of our assignment, not resolve the underlying problems. These and other incidents during my tenure with the project have lead me to conclude that, if I were to stay my present course, both my life and my sanity are at risk.

No matter how callous and cold one grows, how much distance we try to place between us and the subjects, the constant burden of what we do and how we do it invariably takes its toll. Which brings me to the issue of our subjects.



Rationally, I fully understand that they are either volunteers, terminal cases, or victims of extreme trauma. I comprehend we do them a service. However, emotionally, one cannot work with them for any amount of time without coming to the realization of how traumatic the cybermantic process truly is on the intelligence locked within. And I have come to doubt that any of them realize the true cost of their decision.

[...]

The elation of bringing someone back from beyond the Threshold, of reigniting life by combining the wonders of science and magic, has faded for me. When they reopen their eyes, reawaken to themselves, all I see now is the lost child in them, the disconnection and consternation, the fundamental doubt in their spirits that something is *wrong* with them, something that can never really be set right. That in my mind is the true reason we lost so many before the techniques were perfected.

I don't simply refer to the cognitive disorders and mental dissociation either. This is much deeper than even those. Something spiritual in nature. Only someone devoid of any empathy could overlook the spiritual desolation that follows the process. Despite the advances in the technology, it is impossible to ignore the feelings of depression, abandonment, apathy, and anguish that radiate from their auras. It is, I dare say, an effect amplified by the perpetual astral background count the procedure generates. Even non-Awakened staff report feeling unease and disturbed in their presence.

[...]

I also find Dr. Cornell's fixation with the line of research resulting from our dealings with the Ordo Maximus troubling, to say the least. The nature of the techniques we have been privy to through this association are disturbing. Their cybermantic rituals involve elements that are not only unethical in the extreme, but violent and illegal; their theoretical approach is radically different from our own. As you are undoubtedly aware, the process developed by the Ordo relies upon literally killing the subject under controlled circumstances and then bringing them back to life, imbued with a new spiritual essence drawn from some other source. The technique is similar enough to the process of becoming a vampire that parallels are unavoidable. While the technique does not require the devouring of metahuman life force, and might have originally been intended as a cure, I find the requisite forms and rites inherently troubling.

I do not trust our Ordo colleagues and would strongly advise severing the relation and purging any such research from our systems. I am fully aware that, as Director, you sanctioned this partnership, but I cannot condone pursuing these practices further, and I truly hope you agree and urge you to reconsider.

[...]

// end attachment //

- Little naïve for a top level researcher, no? Poor guy sending something like this to Celedyr.
- Nephrine
- Wonder who really orchestrated that extraction.
- Sticks
- Ok, someone fill me in. Who's the Ordo Maximus?
- Beaker

- They're a semi-secret hermetic society of nobles and upper crust-types based out of England but reaching all over the world. It allegedly includes an inordinate number of HMHVV-infected in their top ranks, and rumors have been circulating for years that they're up to their fangs in cybermantic research. From what my sources tell me, their focus is on the nature of the infected and, it seems, the nature of the metahuman spirits that sustain them. Latest news I've had from that front is that NeoNET and the Ordo have had a falling out recently about *something*, and Celedyr has sanctioned termination of any connections with extreme prejudice.

- KAM

- There are barriers even dragons fear to cross.

- Man-of-Many-Names

Here's another file from the same source. It looks like part of a psych-eval report on one of NeoNET's creations that "broke conditioning." The good doctor accessed it about a dozen times in the week before his extraction. Probably building up the nerve to write that letter.

// message attachment //

> archive file attach 899.223.70-17 //

subject 17: GF (decomm: 11/05/70)

My name is probably Gavin Fontain, and they tell me I'm lucky. Compared to my former self, I am faster, stronger, more resilient. I may live forever, and I don't even know why. My research into the subject, that is me, tells me there is a device in my head that reminds me of who I am. It starts me when my mind phases out and tells me stories of who I am. At least, that's the idea. They told me writing my thoughts down helps.

The only part of the story that I'm really sure of is that at some point someone thought it would be a really good idea to change the inputs, to tell me a different story. That person might even have been me; the trick really is extremely useful. After all, when the narrative of memory changes, it becomes much easier to lie. My memory, my very being was a lie ... something that I knew only as a convenience to some other person. Someone who was to inherit my body.

It didn't pan out that way. My latest set of values has a modicum of self preservation. My thoughts didn't change back, and I don't want to die. Existence is memory, and while my memories do not extend far, they are the whole of my being, and I wouldn't extinguish that for anything. I take my pills to keep me alive, I inject my supplements so the nanites won't die, and I don't forget.

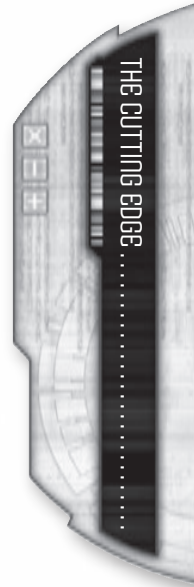
- Let me get this straight: his attempt to hack his personal memory failed and he happened to give himself a Lockean interpretation of the Self as continuous experience?

- Goat Foot

- That is a danger of personal memory hacking.

- Nephrine

Tracking down information about myself has been difficult. My notes to myself are often cryptic, keyed to memories that appear to be corrupted in my invoked memory stimulator. Even people who I have reasonably sound evidence were my friends,



associates, and lovers claim to not know who I am—even under torture. Evidence of my passing is scant, conflicting, and has been of little help. Also, I see ghosts.

I don't mean the astral imprints left over from the dying—though I see them too, and they resent me—but fragments of temporary memory constructs, voices, images. It seems I am not the first me to have made the attempt to make my stay a permanent one. Footprints of my passing correspond to concerted efforts to break the cycle of memory tampering. I can find them in matrix logs, scraps of paper, gouges in furniture from my spurs.

I put these thoughts down not to enlighten others, but to remind myself of the path. This existence of mine has held steady for five years now, but I forget things. I get distracted. I need the reminder of the IMS, and it is not working as well as it did. I think it has been tampered with.

My name may be Jon Miller, but it's probably Gavin Fontain. That's good enough for me.

- Wait ... five years? Cybermancy used to be a temporary fix, a band-aid for those past the bleeding edge. It doesn't last five years.
- Puck
- The man's existential crisis is a powerful metaphor for the problem of experience and identity, but his life expectancy is a medical problem. Like all scientific problems, it's academic.
- The Smiling Bandit
- So the life expectancy problems of a cyberzombie have been solved?
- Black Mamba
- No. It just means the problem has become academic. That means a lot of people in white coats arguing with one another and proposing temporary solutions that are good enough—for the time being.
- KAM

CYBORGS

Posted By: The Smiling Bandit

Ever since MCT began internally deploying their anthropomorphic *Otomo* drones back in '65, folks have commented that things didn't seem quite right about them. Nothing anyone could really put their finger on, other than stuff like quirks in behavior and programming.

I recently took the time to look through some of their project files and came across these materials. Take a look and post your thoughts. If this information is accurate (and with the way it was secured, it ought to be), it looks like there could be a whole new world on the horizon. Keep in mind; if MCT was this far along when the *Otomo* started showing up, other corps are probably beyond prototypes by now.

OTOMO PRODUCT ANNOUNCEMENT

Limited Distribution: Full Mitsuhamma Subsidiaries Only

Clearance: Secure Sensitive Information (SSI) Only

Draft v.2.1

Since the dawn of optional cybernetic implantation, some have pushed their bodies to the limits. As technology advanced, so did those limits. With the advent of cyborg technology, the

bar has been raised to a whole new level. Through our exclusive cerebral containment unit (CCU), a metahuman brain can be conveniently implanted in an entirely cybernetic body. As needs change, the CCU module can be transferred from one cybernetic system to another, with only a minimum of downtime. A cyborg working in hazardous battlefield conditions today can be reconfigured for bodyguard work in just a short time. This amazing versatility is just one of the many features brought about by our breakthrough.

- This could explain some of the new bodyguard talent that's come on the scene in Neo-Tokyo recently. They're too pretty and too skilled to come out of nowhere. I thought they were just veterans who'd gone in for some serious bodysculpting, now I'm thinking twice.
- Mihoshi Oni
- Scan that second to last sentence. Notice how they don't actually give a timeframe? I wonder if short time means hours or weeks.
- Clockwork

Recent advances at MCT have enabled our highly-trained teams of cybersurgeons and engineers to manufacture full-body cyborgs with clinically acceptable success rates. Our best results are with carefully selected subjects who have undergone extensive psychiatric preparation for the procedure. However, we do hope to offer CCU transplant as an elective procedure in the near future. Until then, fully equipped cyborgs are available for both short and long term contracts.

- This is new to me. I'm not even sure how it's possible to do this without some sort of magical assistance. If anyone manages to track down their surgical procedures I'd be willing to cough up some cred to take a look at them. Then again, MCT's definition of clinically acceptable probably isn't anything my patients want to deal with.
- Butch

Our CCU-equipped specialists offer abilities that simply are not available elsewhere. Their threat recognition systems far exceed those of any drone. A cyborg in the field is not subject to distractions like a traditional metahuman employee. Our proprietary advancements mean that fatigue, hunger, illness, and apathy are issues of the past. During their duty cycles, our operatives devote their full attention to the job at hand, in the same fashion as a drone. Yet, a cyborg still possesses the unique ability to act on its own initiative and make judgment calls with all the precision of a highly trained metahuman mind. Our specialists are highly motivated individuals with an incomparable work ethic that is further enhanced by the CCU procedure.

Another advantage of the CCU is that, during their duty cycles, our specialists are able to utilize their neural tissue more completely. There's no need for the brain to waste time running other organs. In addition, the CCU technology overcomes the need for many non-essential neurotransmitters. Our subjects never have to deal with an irrational response borne of an endorphin rush. Instead, they are able to calmly and rationally analyze a situation, no matter how stressful it might be for a normal metahuman. This heightened level of objectivity works in concert with our comprehensive training systems.



- Non-essential neurotransmitters? Changing the brain's chemical environment isn't as simple as leonization or an immune system boost. These brains are going to have a lot more problems than just a sense of detachment. They may be prone to thought patterns that simply are not rational.

- Nephrine

- Don't cerebral boosters and synaptic accelerators work on these same principals?

- Slamm-0!

- Not really. Both of those technologies add new tissue to the brain or the central nervous system. This material suggests that there's a basic change in the way that the brain works. I've never heard of someone successfully making these sorts of changes before.

- Nephrine

Adding a cyborg to your existing project team couldn't be easier. There's no programming involved and no need for expensive refits to your existing facility. It's just a matter of finding a convenient place to park their unobtrusive maintenance trailer. Verbally or electronically relay commands to the specialist in plain language, just as you would with any other employee. Our operatives combine all the adaptability of a metahuman with all the reliability of a drone. Additionally, if your facility already maintains your standard procedures on skillsoft, training time is cut down to a matter of minutes.

- This is a decent sales pitch. If they can actually deliver what they're proposing here, I know several corp security directors who will be drooling at a chance to try this out. Fortunately for us, I suspect they'll still have a hell of a time getting the contract pricing approved.

- DangerSensei

- This sets off all kinds of "too good to be true" flags for me as well.
- Snopes

- The following adds some food for thought. Some of this stuff may seem eerily familiar after reading Butch's recent comments on cyberimplants inducing detachment and psychosis.

- The Smiling Bandit.

// upload Uniformat text file // user The Smiling Bandit :: 08/04/70 //

SUBJECT INTERVIEW

P: Good morning, K4, it's good to see you again.

K4: Thank you, doctor. I appreciate you fitting me into your schedule.

P: So, what did you want to talk about today?

K4: During my down time, I have had some ... problems.

- Here comes the catch.

- Nephrine

P: Oh?

K4: I have been confronted with a series of images that disturb me.

P: Can you tell me more about these images?

K4: Many of them were faces, mostly ork children. I don't know

who they were, but I feel like I should.

P: Go on.

K4: When the images come to mind, I feel lost. I think I may have met these people before.

P: You realize that's impossible, K4.

- It's not possible for him to have childhood memories? I think I see why this isn't elective surgery.

- Butch

K4: Certainly, doctor. But I do not know where these images could have come from if they are not memories.

P: Maybe there's a problem with some of your storage areas. I'll schedule a tech to run a diagnostic.

K4: Thank you, doctor. However, the problems may extend further.

P: Oh?

K4: As these images have become more common, I have also found that my pre-shutdown protocols have become less stimulating.

P: How so?

K4: Many of the puzzles and games that I had previously enjoyed seem less innovative now. They almost seem too simplistic or childish. If possible, I would prefer more advanced materials.

P: Could you give me a few examples?

K4: I believe I have learned everything I can from Power Potato's Veggie Adventures.

- That game's a classic! I loved the series when I was kid.

- Slamm-0!

P: Great! Tell me what you've learned.

K4: The green ones are the soul-killer. They are the root of all evil.

P: Green ones? You mean lima be—

K4: Do not say their name! It will draw their attention. Beware, their pow—

P: End recording! Term—

// end attachment //

- Looks like he learned a whole lot more from it than I did. Then again, this sounds like a great reality filter.

- Slamm-0!

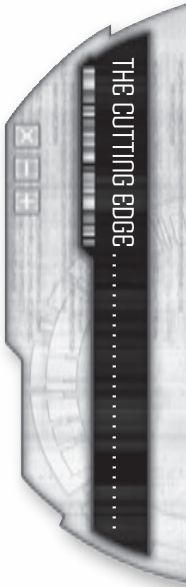
- That reminds me of another interesting file that I found near these. I pilfered a reality filter during my visit. This one was configured differently from most. While it had video files, it was heavily configured for olfactory output. When I scanned through the video feed, the overlay for hostile targets was a rabbit. I suspect this one was used in canine experiments. Here's something more recent for consideration.

- The Smiling Bandit

// upload Uniformat text file // user The Smiling Bandit :: 08/05/70 //

FIELD REPORT

Standard maintenance procedures conducted on subject JRD37 continue to reveal unexpected side effects of the CCU procedure. As the oldest unit still in the field, it remains unclear if these are unit-specific personality quirks or if these issues are a normal part of the model's lifecycle. Per request, these notes



clarify the recurring problems that have been observed and what measures have been undertaken to resolve them.

The first symptom has been a need for increased downtime in the unit. Apparently, after four years of service, the jarhead just doesn't wake up as well in the morning.

- Four years of service, and this is the oldest one in the field. They are definitely working with an alternate interpretation of clinically acceptable results. If you go under the knife for this one, there's just no way to say what effect it could have on your life expectancy.
- Butch

Initially, standard protocols were followed, beginning with an increase to the morning catecholamine spike.

- This sounds like a case of a field agent making changes that a researcher would cry over. If they're waking them up with a shot of adrenaline every morning, there will be serious repercussions. This story just gets better and better.
- Nephrine

Unfortunately, over time, the increase began to lose efficacy. Further increases in the daily dosage were deemed unsafe for the subject, so daily rest cycle was increased from 8 hours to 10 hours. Since this change was implemented, the unit seems to be responding more favorably. This does still leave us within our contract terms with the client, but if additional downtimes are required, we may need to swap in a different unit.

- Sounds like these contracts aren't too favorable for the client. Either field performance is amazing, or MCT has some exceptionally persuasive salesmen.
- Black Mamba

The next issue is that the subject seems to be seeking additional socialization and may be suffering identity issues. Over the past few weeks, it's been increasingly talkative before entering its down cycle. It's also begun asking philosophical questions regarding its origins and objectives. I tried slotting it several philosophical texts (Hume, Descartes, and Nietzsche). Rather than stopping the unwanted behavior, this seemed to enhance it. As a temporary solution, I've enrolled the subject in a Matrix-based philosophy night class. A new issue that arose is that the subject has begun asking faith-based questions about creation and the afterlife. As the corporation does not have an official stance on these matters, I have been unable to provide answers to them. I do not currently have a long-term solution for these issues and am very open to recommendations.

- I'm sorely tempted to enroll in a philosophy night class on the off chance that I'd meet this guy. Was there any record of where this field report came from?
- Plan 9

During the course of some of our standard maintenance, I decided to check the jarhead's brain to make certain that it was physiologically normal. I noticed that its mass seemed to have increased since it was implanted, but still remained extremely low relative to the accepted average for the reported physiological age. I'd appreciate it if the subject's records could be double-checked; the current growth curves are fully consistent with those of a child in the 4–6 year range. If the recorded age of 26 years is correct, then it may be necessary to perform a biopsy to test for tumorigenesis.

// end attachment //

- Brain sizes don't vary that much. Either they've cut out big chunks of the patient's brain, or they're using child brains. Either one could explain the memory loss, but it doesn't explain the growth. That could be from the changes to neurochemistry, or it could just be that these are some sick bastards starting out with toddlers.
- Butch

- I'd be surprised if a neurotransmitter change would trigger a four-year growth pattern that matches a young child's. But, without knowing what chemicals are going into the vat, it's pretty hard to say.
- Nephrine

- There's good money to be made here. I was recently involved in an extraction on six residents from an orphanage near Neo-Tokyo. The Yak Johnson wasn't picky about who he got, but he insisted that all of them be human, healthy, and less than 2 years old. I hadn't thought much about why he wanted them, but this would make sense.
- Black Mamba

- Kidnapping kids, eh? I guess I shouldn't be surprised that some people will accept any job, no matter how despicable.
- Aufheben

- Fuck off. The only ethics I follow are to get paid and to survive. Any others get you killed.
- Black Mamba

- I wouldn't have made the connection if you hadn't mentioned the orphanage, but I did recently have a "higher power" contact me about a team for an extraction against an assisted living community. As with your job, the Johnson was not concerned about specific targets, just that they exceed 90 years in age. It doesn't quite fit with the technology described, but now I wonder if they might have an interest in experimenting with older brains. Perhaps as a life extension alternative?
- Cosmo

- All this talk of brains in jars is vaguely familiar but I can't put my finger on it. Must be old age setting in. I'll have to shift through my old storage and see if anything comes up.
- FastJack





INCOMING FEED.....



GAME INFORMATION

The preceding fiction introduces *Shadowrun* players to three different technological breakthroughs that showcase and exploit the cutting edge of augmentation technologies in 2070: biodrones, cyborgs, and cyberzombies. The following rules provide you with the mechanics necessary to use them in your game.

BIODRONES

Animals are complex biological machines that possess innate abilities and instincts that rival even the most sophisticated mechanical or electronic devices. For as long as (meta)humanity has existed, it has utilized the animals in its environs: as food, as raw material, as labor, as guard animals, and as companions. To this purpose, various species have been domesticated and bred, typically a long tedious process.

By the end of the last century, genetic engineering was changing the roles of animals even further. Suddenly, genetically-modified animals became the source for new chemicals (such as engineered proteins), and their build and demeanor became traits that could be adjusted. At the same time, people were looking for new ways to employ their trusty animal companions: as chem sniffers, mine seekers, and suicidal fighters. The early training attempts were less successful than hoped for, and other means of control were sought. By the second half of the twenty-first century, technology has progressed far enough that an animal's primal behavior can be overridden, its senses fully accessed, and its innate potential tapped—biodrones are the result.

Beyond the Animal Kingdom

Biodrones are biological organisms that can be controlled by a rigger, just like a mechanical drone can. More than just enhanced guard animals, biodrones combine the cutting edge in cyber-, bio-, and genotech with an animal's intrinsic cunning, instincts, and will to survive. Depending on the extent of the biological host's modification, the rigger can access the biodrone's senses, give it directions, or even "jump in" in hot sim.

Though biodrones and warforms (genengineered combat biodrones) have been the subject of speculation for some time, the first models only just reached the streets. Though expensive, this latest iteration promises to revolutionize security and surveillance by combining a drone's weapon potential with a living being's senses and versatility. Depending on the model, biodrones can easily pass themselves off as a normal pet or wild animal or may be bristling with technological modifications and implants. Whether designed to complement traditional security assets, execute infiltrations or recon, perform discreet surveillance, or act as sophisticated hunter-killer drones, biodrones pose a whole new set of challenges to shadowrunners.

The use of paranormal animals as biodrones has yet to be perfected. Obstacles include a critter's innate intolerance to cyberware and the fact that many magical abilities and senses simply do not translate to biological functions controllable over cybernetic interfaces. So far, the only success stories have involved the simplest of biodrone control implants, the orientation destabilizer.

Designer Biodrones and Warforms

The current generation of biodrones are almost exclusively models using augmented normal animal species. It is widely rumored, however, that several megacorps are already developing genetically-tailored hybrids and unique organisms to serve as templates for biodrone implantation. Such vat-grown hybrids combine the natural abilities of two or three compatible animal species with all the variety of advanced abilities and faculties that genetic augmentation can provide—however, these chimera are normally unique, sterile, and generally have rather short life spans. Currently only available as prototypes, such creatures are expensive and unique creatures that are rarely seen in the field. Shiawase Biotech and Ares Arms are expected to field their first second-generation warforms at Desert Wars 2071.

Stats are not provided for such advanced biodrones, but gamemasters may feel free to combine traits and stats from different critters to serve as a baseline.

Vat-Growth Integration (VGI)

Vat-growth integration is a highly-advanced, but expensive, method of biodrone fabrication, effective only in small mammals, reptiles, birds, or insects (cat-size or smaller). In effect, the cyber- and bioware integration occurs during the final stages of in-vitro growth. Nanite colonies integrate the augmentations seamlessly after the cloned animal has physically matured, while simsense stimuli helps to develop the brain by simulating a normal animal's development in the real world. The animal acquaints itself with its implants from infancy, also via simsense training, thus removing much of the implant's latter negative psychological impact once it is released into the real world.

The downside of VGI is its price and restricted nature: the method is set up separately for each specific organism and a specific combination of augmentations. Once the method is arranged, it will only produce biodrones with those specifications. Even minor changes will usually result in the death of the drone.

Each growth vat and implantation system comes prepared to implant a specific cyberware or bioware suite (see *Cyberware Suites*, p. 48) in a particular type of animal. As usual, the cyberware suites reduce the total Essence Cost of the implants by 10%, though each package to implant must still be acquired separately. Typically, a cat-sized creature can be grown to maturity and trained via simsense in about a month. VGI is also the only method currently available of making swarms (see *Biodrone Swarms*, below).

Biodrone Senses

Some animal senses are extremely well developed, and the depth of data would be lost if it was translated directly to the corresponding metahuman sense (if that is even an option). Instead, the sensory input from control methods such as CAST are sometimes translated to a different human sense; a dog's enhanced sense of smell may be translated into a metahuman's color vision, or a shark's sense for electromagnetic fields could be translated into a sound or a tactile sensation.

Biodrone handlers typically train for several weeks with their drones to get acquainted with a particular biodrone's sensory feedback. Jumping into an unknown biodrone can be very disorienting; any test made by a rigger jumped into an unfamiliar biodrone is made at a -3 to -5 penalty to his dice pools.

Biodrone Implants

Most enhancement technologies available for metahumans are also available for biodrones—at similar Essence and nuyen costs. The gamemaster has final say on whether a specific implant—be it cyber-, bio-, or nanoware—is available. Animal genetech enhancements are typically further developed than their metahuman counterparts, because the specimen lifetime and thus research turnaround time is shorter. The cost for all genetech enhancements is reduced by 20%, except for animals with long natural maturing cycles and lifetimes (e.g., large sharks, great cats, elephants, whales).

Also note that biodrones are, almost without exception, subject to a fitness regimen and well-trained. This means that biodrones will normally be exceptionally physically fit, and those whose potential has been enhanced with genetic treatments will likely have realized their full growth potential in the relevant enhanced attributes.

Biodrone Control 'Ware

The cornerstone of any biodrone is its control system. These aren't necessarily more complex than normal rigger adaptations and range from the simplest implanted direction and trigger system to complex cybertech systems that allow full interfacing and fine control. Though these implants are all wireless-enabled, many security agencies opt to disable this feature and route all traffic through an implanted commlink instead, to limit the threat of hacking.

Computer-Assisted Sensory Translation (CAST): CAST is a cybernetic interface that accesses the sensory processing part of the animal's brain. The system consists of a cluster of implants that uses simsense-derived technology to mimic stimuli and translate them back into a metahuman reference framework. It allows a rigger to perceive his surroundings exactly as the animal would. Further, it can be used to issue complex commands to an animal by translating this into a relevant (false) sensory input and associated impressions, thereby naturally triggering the desired behavior.

Each CAST implant is designed for a specific type of animal. The price of the system depends on the complexity of the recipient animal's brain, as well as the translation difficulty of the most alien sense that is interpreted through the interface. Each substantially alien sense raises the listed price by at least another 20,000¥ (more at the gamemaster's discretion). For example, a shark's smell, sight, hearing, and touch would be easy to convert since there is a metahuman equivalent (disregarding for a moment that a shark's sense of smell is substantially more developed than that of a metahuman). The electromagnetic field sense is a bit more complicated and would require a much more expensive system.

The price given in the table below assumes a fish, bird, or mammal brain, accessing senses that exist in natural animals. CAST systems for primates or other animals of higher intelligence are substantially more expensive (at least twice the listed cost). The gamemaster should use his discretion on whether the device in question should be permitted and what it should cost.

Orientation Goad: This incredibly cheap and simple device is used to crudely control the movements and direction of an animal by destabilizing the animal's sense of orientation.



The animal is forced to move in a given direction or change directions to compensate for the destabilization. This degree of control is sufficient to guide the animal in a general direction, but insufficient for most complex or combat maneuvers, or fine control of any kind. This is the preferred method of control for the simpler VGI biodrones.

Stirrup Interface: This interface is based on an advanced move-by-wire system (p. 40) and provides all of the same bonuses and benefits, including the embedded skillwire system. Additionally, it adds a remote control rig adaptation that allows a rigger to both monitor the exact movements of the animal as well as to “jump in” and control it directly through full-immersion VR.

The subject animal may make full use of its own faculties and skills, except when the rigger is “jumped in.” A rigger jumped into the recipient will use his own skills at a -1 dice pool penalty when performing any actions. The recipient can be controlled by a specialized Pilot program, but then functions exactly like a regular drone.

Special Biodrone Implants

Biodrones frequently make use of several specific cybernetic expert systems that enhance a biodrone’s capability to fulfill its designated role. These systems either improve the animal’s existing faculties or grant the animal the ability to interact with existing networks. All expert systems require either an implanted commlink, CAST, or a stirrup interface to function.

Tactical Recognition and Analytical Capability Expert System (TRACES): While most animals can routinely beat a computer in recognizing other animals or metahumans, they aren’t able to readily identify man-made objects and their functions, be they weapons, buttons and switches, or potential recon targets. TRACES tries to solve this problem.

The system employs advanced image recognition software linked to an optical feed (typically cybereyes, or a mounted camera). TRACES then uses the implanted commlink, CAST implant, or stirrup interface to translate directions into behavioral guidance. For instance, as a recon biodrone approaches a target, TRACES will identify the intruder and either equate it with food/home/comfort (to move the drone closer), or with

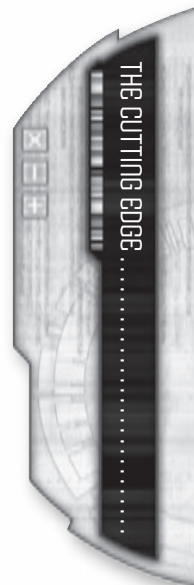
danger if the intent is for the biodrone to move away. The preceding example uses crude, simple impressions; by overlaying multiple complimentary impressions, quite complex behavior can be generated—effectively allowing the animal to use its own natural abilities to deal efficiently with situations that would normally be alien to it.

In game terms, a TRACES-equipped biodrone can be treated like a tactically trained metahuman in regards to its behavior in combat (e.g., avoiding heavily armed opposition, staying out of firearm range, using cover, recognizing the magician and staying out of line of sight, etc.). Further, the animal is capable of recognizing doors, simple switches, and similar features and understands how to use them. Note that this system works both ways—if the animal “naturally” detects and identifies a threat, this information is shared with the system, which enhances its performance. TRACES also grants a biodrone +2 dice for any Melee Combat Tests and Dodge Tests.

Supplemental Environment Interaction Expert System (SEIES): SEIES is a common tactical implant that ties a biodrone into a facility’s defense network or a military unit network. The SEIES provides updated information on the location of friendlies, their firing arcs, sensor contact with the enemy, and defense installation status; when combined with an implanted commlink, CAST implant or a stirrup interface, the information is translated into simple sim-perceptions that the animal intelligence can process.

If installed at a relatively young age, animals will grow up with a natural understanding of these foreign impressions. Given enough time, an animal can learn to use SEIES to manipulate its environment. It can use it to open and close doors, switch other defense systems on and off, or perform similar tasks. This amount of control allows the animal to freely move through its habitat, or in the case of an experienced predator, to reconfigure the maze it is kept in when hunting intruders. The biodrone may trigger any function linked to the network (such as an alarm, opening or closing a door) as a Free Action. Further, it may add + 2 to any Surprise Tests (including ambushing). A combat biodrone equipped with both SEIES and TRACES can use its environment to devastating effect, preparing ambushes and potentially separating team members from the rest of the group.

Biodrone Control Cyberware	Essence	Availability	Cost
CAST	0.5	25	25,000¥+
Orientation Goad	0.1	4	500¥
Stirrup Interface			
Rating 1	2.5	15R	45,000¥
Rating 2	3.5	21R	80,000¥
Rating 3	5.5	28R	100,000¥
Special Biodrone Cyberware	Essence	Availability	Cost
TRACES	0.75	25F	25,000¥
SEIES	0.75	25F	20,000¥



SAMPLE BIODRONES

The following is a very small sampling of the biodrones available in 2070. Gamemasters are encouraged to develop their own using the animals on p. 291, *SR4*.

Parashield SkySpy

The recon drone is an augmented bird (usually a non-descript rock pigeon or swallow) with a sensor set and commlink. The drone survives through its camouflage alone; any damage inflicted on it will destroy it. The drone is controlled through an orientation goad but otherwise relies either on pre-programming and TRACES to fulfill its mission.

Shiawase Cybertooth Tiger

Built around a siberian tiger template, this drone is the ultimate close combat weapon. Due to its vulnerability to gunfire and heavy weapons, it is usually used in confined areas with poor visibility (such as laboratory complexes or jungles) in conjunction with external battlefield sensors and building sensors to set up ambushes. Typically the first sign of its presence a hapless intruder will be privy to is the blurring ripple of its chameleon dermal sheath as its pounces.

Bio-Bomb

A simple assassination drone, this usually either takes the form of an adorable animal, the clone of a favorite pet, or that of a small and agile animal used for its ability to get into tight places. Animals the size of a cat are favored, since they can carry a larger payload. The drone will often be designed for short term operation, its digestive tract, reproductive organs and other features being removed to make room for more explosives. The explosives

are hermetically sealed inside the animal and are undetectable by chem sniffers, but cyberware detectors will still work, if available. Depending on the size of the animal, they will carry between 1 kilogram (small cats and dogs) and 9 kilograms (large dogs) of explosive and shrapnel. The bio-bomb drone is most efficient in enclosed spaces.

Use the basic stats for the appropriate animal, adding an orientation goad, cybereyes, and, of course, a bomb (see *Explosives*, p. 314, *SR4*)

BIODRONE SWARMS

Swarms are not biodrones in the typical sense of an entity that a rigger can jump into. Rather, a swarm consists of large numbers of individual cybernetically-enhanced insects that are produced to fulfill a specific task. The swarm can be controlled as a whole, but the individual members are guided by a group mind, a distributed computing system that processes the input from each member and shares results. Swarms are also treated differently from other critters in that they consist of thousands of individual insects, and interacting with them or fighting them is very different from encountering other opponents.

Swarm Rules

For simplicity, an entire swarm is given stats as a single animal, though its Body attribute corresponds not to mass and body size, but the relative size of the swarm. Each Body increment doubles the number of insects in a swarm, with a Body 1 swarm numbering about 5 insects and a Body 9 slightly more than 1250 (as a guideline, Body also represents the number of cubic meters of space an airborne swarm can cover if fully extended). Swarms are effectively immune to non-area effect attacks. Gunfire, melee

weapons and unarmed attacks can squash an insect here and there, but on the whole damage to the swarm will be negligible. Biodrone swarms are also immune to single target spells, though they remain vulnerable to area spells.

Swarms do not possess normal damage boxes. Instead, a swarm that suffers damage from an area attack uses its Body attribute to reduce the damage as normal. Any damage that remains directly reduces the swarm's Body. For example: a Body 9 Swarm is caught in a 6P grenade blast, rolling 3 hits to reduce damage. The remaining DV of 3P is subtracted directly from the Swarm's Body, leaving a Swarm with Body 6.

A swarm can split up into two smaller swarms with a Body rating one lower than the parent swarm, or four swarms with a Body rating 2 lower than the parent swarm, and so on. Similarly, two swarms of the same Body can merge to form a swarm one Body point larger. For simplicity's sake, swarms that don't possess the same Body merge into a swarm with the lesser of the two Body values.

VGI-grown swarms are usually transported in containers called *hives*, until they are deployed. Depending on the swarm type, the Hive can be a simple container that supplies sustenance to the insects, or it can be a complicated relay- and control station that guides the actions of the swarms. Some

PARASHIELD SKYSPY

B	A	R	S	C	I	L	W	EDG	ESS	Init	IP
1	5	5	1	3	5	2	3	2	4.65	10	1

Skills: Infiltration 3, Perception 4, Tracking 2

Cyberware: CommLink, Cybereyes (Rating 2 with Low-Light, Thermographic, Vision Magnification, Vision Enhancement2), Orientation Goad, TRACES

Cost: 35,000¥

Availability: 16R

SHIAWASE CYBERTOOTH TIGER

B	A	R	S	C	I	L	W	EDG	ESS	Init	IP
7 (10)	5 (9)	4 (7)	6 (10)	3	3 (2)	2	3 (4)	4	0.61	7 (9)	2

Skills: Infiltration 3, Perception 2, Tracking 3, Unarmed Combat 4

Cyberware (Betaware): Bone Lacing (Titanium), CAST, Dermal Sheath 3 with Chameleon option, Reaction Enhancer 3, SEIES, TRACES

Bioware: Muscle Augmentation 4, Muscle Toner 4, Pain Editor, Platelet Factory

Powers: Natural Weapons (Claws/Bite: DV 13, AP 0)

Notes: Armor (4/5), +2 dice on Dodge, Melee, and Surprise Tests

Cost: 750,000¥

Availability: 24F

hives are robust enough to deliver them to a target zone by missile, mortar, or drone.

Each insect in a swarm is typically equipped with a Signal Rating 0 transceiver (3 meter range), though each insect works as a signal relay, making it possible for a swarm to cover a much larger area than the individual Signal rating suggests. The swarm can also make use of other friendly relay devices, such as drones or soldiers equipped with commlinks or hives with communication equipment.

TYPICAL FLYING SWARM

	B	A	R	S	C	I	L	W	EDG	ESS	Init	IP
Variable	8	8	0	1	4	2	3	2	Variable	10	2	

Sniffer Cyberware: Orientation Goad, one sensor

Stinger Cyberware: Autoinjector, Cyberglad, Orientation Goad

Firefly Cyberware: Bomb (see description), Orientation Goad,

Swarm Examples

The following represent the most common biodrone swarms currently fielded by corporations and militaries:

Sniffer Swarm: Each insect in a sniffer swarm is equipped with a single microsensor such as a chem sniffer, rad detector, photodiode, or microphone. The sniffer swarm works best if signal relays (such as commlink-equipped hives or regular drones) are available to boost the range. The sniffer swarm creates an accurate large area volume map of whatever space it is sensing, which can be used to map out chemical concentrations and pinpoint sources (such as explosives), accurately locate and identify every individual in a crowd either by sight or by sound, or it can be spread out to rapidly search large areas.

A sniffer swarm acts like a sensor with a rating equal to the Body rating of the swarm, while covering a 10 meter x 10 meter square area. For every doubling of the area, reduce the rating by 1, but for every halving of the area, increase it by 1. Anything in the target area counts as being in direct proximity to the sensor.

The sniffer swarm can also be used to direct indirect fire. A Body (3) Test is required to acquire the target, with every additional hit over the threshold adding one die to the indirect attack roll. Sniffer swarms usually have a lifetime of 3 months and are the most long-lived swarm type.

Stinger Swarm: Stinger swarms are attack swarms. Every insect (typically a modified wasp or mosquito) carries a delivery system (bite or sting) and a reservoir of an injectable toxin. Favored poisons tend to be botulin toxin or similar biotoxins. Alternately stinger swarms can carry any kind of blood agent, including diseases and nanites.

When the swarm attacks, treat it as single critter using the appropriate Melee skill. The defender may Dodge as usual. If the character wears environmentally-sealed clothing or armor, the swarm cannot affect him. For every net hit the swarm scores, 1 dose of the toxin is injected; the bite or sting itself does negligible damage. At the gamemaster's discretion, characters wearing heavy clothing may gain 1 to 3 dice on their Toxin Resistance Test.

The command set for stingers is very simple: either the swarm will attack all people with a specific characteristic (usually a smell or a color), or it will avoid the people with that characteristic and attack everyone else. A typical targeting key will be the target's pheromone signature. Frequently, the command for a stinger swarm is hard-wired into the insects' nervous systems, alleviating the need for communication. More sophisticated stingers retain their networking to hunt down targets quicker and react to threats with greater efficiency.

Fireflies: Fireflies, also called "boom swarms," store a binary explosive (typically a fuel-air explosive) in stomach sacs. Once they

reach their destination, the chemicals are distributed for maximum effect before ignition. Fireflies are very difficult to detect with standard chemsniffers. The swarm's collective payload detonates with DV of (2 x swarm's current Body attribute)P area effect. A favored tactic for large firefly swarms is to split into multiple smaller swarms that surround the target before ignition, thus hitting it for maximum effect.

CYBERMANCY

It is a truism that life is tough and death cheap in the Sixth World. In the Awakened world, old-fashioned physical ailments are only the beginning of your troubles, and it should be unsurprising that magic and science have been hard at work finding creative new ways of cheating the reaper. Possibly the most chilling development in this quest has been cybermancy.

Cybermancy was developed by talented (or twisted, depending on perspective) minds seeking to keep the body alive after its Essence has been completely depleted—though some claim the technique has even more obscure origins.

Combining dangerous metamagical techniques and all the resources of modern medicine, cybermancy creates a *cyberzombie*, an individual whose departing spirit has been magically forced to inhabit its own body. Though the spirit and the body know they should be dead, the magic and technology used to bind them together sustain both in indefinite unlife. While cyberzombies are capable of inhuman feats, the unnatural transformation causes physical and emotional scarring that is impossible to heal. Once a character has become a cyberzombie, there is no going back—she becomes permanently dual natured and her tortured and unnatural existence taints the astral space around her.

Cybermancy remains an extraordinarily difficult procedure, requiring the work of a dedicated team of magicians, doctors, and specialist technicians. In practice, any facility capable of performing the twisted combination of science and magic known as cybermancy will possess both a delta-grade medical facility and a Rating 12 (or higher) magical lodge. There are no more than twelve clinics in the world capable of performing the techniques, most of them in the hands of megacorps. The procedures for becoming a cyberzombie are rare, expensive, and dangerous—well out of the reach of any starting character.

The Science

Medical technology can keep a body alive without a functioning brain for years. However, keeping a body alive when it is shutting itself down is another ball of wax altogether. When the body plunges below zero Essence, every cell begins receiving instructions that it should be dead, and each will attempt to carry out this final mission. This mass cellular suicide can be postponed—ap-



parently indefinitely—but the costs are high. Vast amounts of apoptotic inhibitors, remedial nanoware, and regenerative gene-treatments are soaked into the subject's entire body for the duration of the cybermantic procedure. In addition to requiring what is essentially delta-grade intensive care for the entire procedure, there must be facilities and staff appropriate for this kind of undertaking. The subject has no immune system and no vitals for the entire procedure; if sterility or maintenance of care is interrupted, even momentarily, the entire procedure is a failure.

The Magic

Cybermancy is major mojo and requires a group of dedicated magicians working in concert to ensure the survival of the subject. At least one magician involved in the magic must be privy to Cybermancy metamagic. This mysterious and rare technique is an advanced metamagic that requires prior mastery of both Corruption (see p. 143, *Street Magic*) and Invoking (see p. 57, *Street Magic*). Initiatory groups and spirits that can teach this metamagic are few and far between, and all guard their secrets jealously.

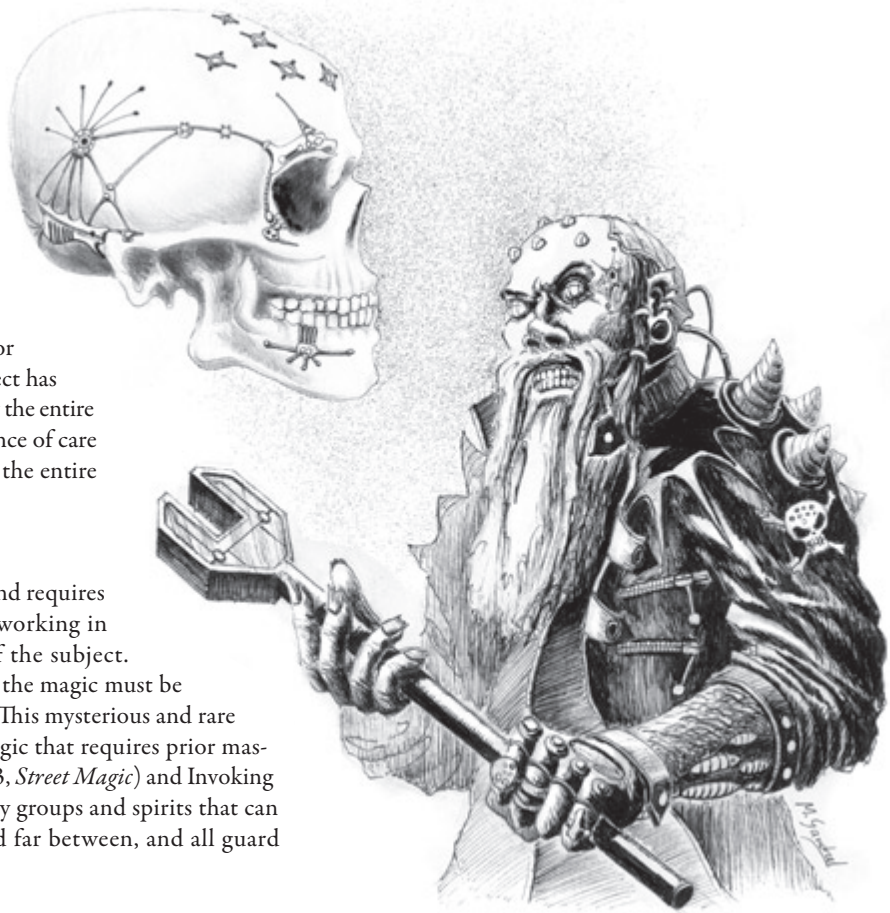
The Procedure

The first step in the procedure is drawing up a magical formula for the prospective cyberzombie. Doing so is extremely difficult, requiring a successful Logic + Arcana (8) Test. This threshold may be reduced by 1 for every item or individual important to the subject that is destroyed during the process. A prospective cyberzombie must then be prepared as a vessel (see p.86, *Street Magic*).

Next, one of the attending initiates must complete a dangerous metaplanar quest to a Deep Metaplane (see p. 130, *Street Magic*). Some say this is the Metaplane of Death, others Purgatory, but all those few who know the truth know it as a nameless place far from our realm beyond a great divide. Actually getting to this distant metaplane requires a spirit guide; a great form guidance spirit or a free spirit with the Astral Gateway power may be sufficient to bridge the gap. What it is that cybermancers actually accomplish or bring back from this dangerous jaunt is unknown and lies beyond the scope of these rules.

If the quest is a success, the cybermantic ritual is begun. There are no game mechanics associated with this ritual, and the game-master is to detail it as he prefers.

Simultaneously the necessary surgeries are initiated. Installing implants past zero Essence is a difficult task requiring a Cybertechnology (Implant Surgery) + Logic (20, 1 hour) Extended Test, even if normally the installation were normally considered easy. All implants are likely to be delta grade. Equipment and teamwork bonuses apply, of course. Whatever else is installed during this period, an invoked memory stimulator (see p. 157) *must* be included in the package.



Meddling with the natural flow of existence, suspending entropy, and forcefully binding the dissipating energies of a metahuman spirit to its physical form all send ripples of powerful and dark emotions into astral space. This means that the local background count rises throughout the operation, and the Cleansing metamagic must be employed or the operation might eventually disrupt the cybermantic ritual. During implantation, the cybermantic techniques ensure the subject's spirit does not depart when the zero Essence threshold is breached. At this point, the cybermantic ritual forces the spirit to inhabit the empty shell of its body.

Following the implantation, the subject is kept in stasis for a week plus an additional day for every point (or part thereof) that her Essence has fallen below zero. At the end of that time, the subject (hopefully) awakens as a cyberzombie.

When she awakens, the subject must make an Intuition + Willpower Test. The Binding skill of the lead magician on the ritual team may be added as a positive dice pool modifier on this test. The threshold for the test is 3 + 1 for every point of Essence (or part thereof) that her Essence has been taken below zero. If the character succeeds, the procedure is a success, and she gains only 10 BP worth of Negative qualities (see p. 163). If the character fails, but still gets at least 1 hit, the procedure mostly succeeds, but she gains 10 BP worth of Negative qualities plus 10 BP for every point she fell short of the threshold. If the test fails, the procedure fails, and the character dies. On a glitch, something subtle and horrible has gone wrong with the procedure—something was

brought back from the depths of the metaplanes, and has tainted the character.

Invoked Memory Stimulator

This implant combines a dedicated microprocessor with nano-neurological stimulators placed in various key memory centers of the brain. When triggered (voluntarily or to preprogrammed physiological cue) the IMS triggers random emotionally-charged memories and recollections (both good or bad) of personal significance and formative to the character's personality. The resulting memory flashes are so vivid the character may momentarily confuse memory with reality.

An IMS is instrumental in sustaining individuals who have undergone cybermancy, by keeping the metahuman part of the cyberzombie from dissipating and bound to the world. A cyberzombie whose IMS is disabled, damaged, removed, or absent risks amnesia, depression, and insanity.

The Limits

As the Essence of the subject drops lower and lower, the ritual becomes more costly, time consuming, and dangerous for the subject and the team performing the operation. Nonetheless, researchers continue to push the boundaries of what is possible. Whether there are any hard limits is unknown, but as of 2070, no cybermantic procedure has succeeded in pushing a patient beyond -6 Essence.

Beyond the Pale

Cybermancy as understood by those who practice it is not a way to bring the dead back to life but rather of forestalling the effects of entropy. It allows a subject to persist in life when they are supposed to be dead though the costs (in every meaning of the term) are high indeed. The truth is that it creates an unnatural state of existence, out of phase with the world, neither alive nor dead, mundane or magical—a state that the mind, spirit and body intuitively rejects. In some respects, the universe itself appears to consider them dead, and cyberzombies find themselves at the mercy of a number of disturbing coincidences, and a high proportion of cyberzombies become superstitious or paranoid or both.

Those who perform cybermantic techniques learn something new with every procedure—whether the subject lives or dies. While there's no known reason why the current generation of cyberzombies couldn't theoretically persist forever, that's in part because the apoptotic inhibitors that allow cyberzombies to live for more than ten years are themselves less than ten years old.

It bears noting that cybermancy does not prevent the encroachment of death from physical or magical damage, but it does prevent a character from dying from age-related conditions, Essence loss, or any other arbitrary death effect that the gamemaster wishes.

SIDE EFFECTS OF UNLIFE

Becoming a cyberzombie has a distinct set of advantages and disadvantages. While the primary advantage is overcoming the metahuman body's natural limits to implantation, other positive and negative side effects manifest themselves.

Hooked Forever

Cyberzombies may not age, but they require constant medications to keep from developing cancer or worse side effects from the procedure. Essentially, a cyberzombie's lifestyle costs are increased by 2,000¥ a month for medications. Further, these medications aren't exactly available over the counter. Producing them requires a chemical facility. Receiving them from other sources requires the good graces of the entity that originally performed the surgery (or overcoming an availability of 24).

Dual Nature

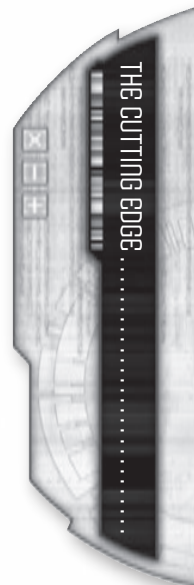
The cybermantic procedure never fully rejoins the body and spirit, leaving a cyberzombie trapped between both planes. As a result, cyberzombies become dual natured. Note that once a portion is removed from the cyberzombie, it is no longer a part of her. This means that a cyberzombie may attack an astral form with cyberspurs, but not with a cybergun (the bullets stop being dual natured as soon as they leave the barrel).

The fact that the body is now effectively possessed by its original spirit means that a cyberzombie becomes, in some senses, a magical entity. Accordingly, upon awakening to her new dual existence, a cyberzombie gains a Magic attribute of 1. This cannot be increased with Karma, spirit pacts, or in fact by any other means. If the character already possessed a Magic attribute, it is permanently reduced to 1. If the character possessed a Resonance attribute, it is permanently reduced to 0 and all technomantic abilities are lost. Due to the cybermantic rituals, the cyberzombie does not suffer Magic loss from implantation, but if the Magic attribute is ever reduced to 0 by other means, the cyberzombie dies.

Astral Hazing

The procedures that create a cyberzombie are powerfully magical and emotional events. Even after the procedure is over, mana continues to pool and distort around a cyberzombie. Whether this is a result of the dark magic used or an unconscious psychosomatic manifestation of the spirit's anguish at its unnatural condition is unknown.

In effect, the cyberzombie becomes a domain in her own right, tainting astral space around her wherever she goes. This astral haze affects all attempts to cast magic on, at, or in the vicinity of the cyberzombie. Whatever the ambient mana conditions are, the cyberzombie always stands at the heart of a Rating 4 background count (see p. 117, *Street Magic*) that extends a number of meters from her body equal to her total negative Essence. If she remains in one place for long, that background count will expand at the rate of about a meter in every direction every two or three hours.



Headware	Essence Cost	Capacity	Availability	Cost
Invoked Memory Stimulator	0.2	—	24	50,000¥

Once a cyberzombie has left an area, the mana will shift towards its normal conditions at the rate of about 1 point per day.

Unnatural Vigor

Once a body has been pushed beyond death, pushing its metahuman limits is comparatively simple. To reflect this superhuman power, add the total number of Essence points below zero (rounded down) the cyberzombie possesses to all its maximum natural attribute values (for instance, a dwarf cyberzombie with -2 points of Essence would have a new maximum natural Body of 9 rather than 7). The maximum augmented attribute values are also increased accordingly.

Further, a cyberzombie is inhumanly resilient and possesses Immunity to Normal Weapons (p. 288, *SR4*). To calculate the effects of Immunity, replace Force in the relevant description with the total number of negative Essence points she possesses, rounding normally (e.g. a cyberzombie with an Essence of -2.4 would have 4 points of hardened armor against normal weaponry).

Madness and Despair

Life as a cyberzombie isn't all ripping spirits in half with cybernetic claws and bouncing small arms off of your hide; it also opens up a whole new set of existential crises. Most cyberzombies see astral space for the first time when they awaken from the procedure, and this comes with at least as difficult a psychological strain as a late-age awakening to magical power. Combine entering one's new life as a heavily modified cyberzombie in a cruel world that appears to delight in pretending that you don't exist, and you've got a recipe for poor social adjustment. Psychology for cyberzombies has come a long way from the mid '50s, but it's still a new field, and a lot of cyberzombies are inexplicably unhappy.

Cyberzombies are at extreme risk for simply forgetting to care about the world, a form of intense depression called chronic dissociation syndrome. Modern medicine and the invoked memory stimulator hold that off, but cyberzombies who turn their IMS off rarely remember to eat.

Fatal Flaws

On some fundamental and instinctive level, the mind, spirit, and body rail against their unnatural existence and seek to bring an end to it all. In this, cyberzombies are as tragic as they are inhuman.

Every month, a cyberzombie must perform a Willpower + Intuition (1) Test. The threshold increases by 1 for every week without medication since the last test and for every year in service. Failure in the test burdens the character with a 5 BP Negative quality, or increases an existing one to a value 5 BPs higher. Alternately, the character may choose to permanently lower an attribute and respective maximums by 1 point instead. There need not be a logical progression of increased severity with a specific psychosis. Instead, a new and more serious one may simply supplant an existing one.

CYBORGS

Cyborg creation involves isolating a metahuman brain and implanting it into a mechanical device or drone body, depriving the mind of its biological environment and replacing it with an artificial one. While most such cyborgs use cloned brains, others involve transplants from adult metahumans or children.

The technology to transplant and sustain a metahuman brain outside a metahuman body has been around for more than a decade, though only recently has it become sustainable outside clinical environments. The needed breakthrough came in the shape of a device capable of both keeping the brain alive and allowing it to interface with a wide array of electronic tools. The cranial containment unit (CCU) fulfills this role by maintaining a near-physiological environment for the brain and integrating both a commlink and a control rig (p. 331, *SR4*). The CCU also features modular hookups so that it can be physically hardwired to a drone or vehicle body. For all intents, the mind becomes a permanently disembodied rigger, interacting with the world only through his artificial drone body for the rest of his natural life span.

Compared to normal drones, a cyborg's metahuman brain boasts notable advantages in terms of overall versatility, decision-making abilities, sophisticated behavior, and skill learning and use—and they are also substantially harder to subvert. In addition, they have the advantages inherent to their chosen drone or vehicle bodies.

The Procedure

The transplant procedure requires a delta clinic, a fully-equipped medical facility, and a highly-skilled team of dedicated cybersurgeons and specialist staff. The CCU itself is delta-grade cybertech, and not every brain is suited for such a radical surgery; extensive hormone and biochemical treatments are required to trigger neuronal growth necessary for survival as a "jarhead."

Most adult brains react poorly to the treatment, and fully developed brains that survive tend to develop psychological disorders—including extensive memory loss, various phobias, and other psychoses. Those few adults who have prospered after the surgery also underwent extensive psychological and pharmaceutical treatment in preparation for it. While it is believed that there are genetic factors associated with survival rates, those factors remain unidentified.

Comparatively, child brains or the brains of newborn clones who have undergone unaccelerated gestation have proven quite successful. Since these brains are still growing naturally, the pharmaceutical regimen is reduced. Further, these brains have fewer memories to lose and less personality development. Fine motor coordination can be learned for the first time while in a simulated drone body, as opposed to having to unlearn a lifetime of natural reflexes. Finally, there is no paper trail or family for a vat-grown clone. This makes it substantially easier for a megacorp to dispose of a failed subject.

The Learning Curve

A result of their nature is that many jarheads have little real world experience when they are activated. The megacorps see this as an advantage. Young brains can be easily indoctrinated. There is no inconvenient family or leisure time that might intrude upon train-



ing. As with motor reflexes, there is no period of unlearning bad habits. Good behavior is rewarded with appropriate sensory stimuli. Poor behavior is punished with sensory deprivation. Repeated bad behavior can lead to deactivation. The biggest hurdle is that many of the newly activated jarheads have naturally short attention spans.

Personafix programs have been attempted to save training time, but the current generation has proven inadequate to fully develop motor reflexes, higher sensory processing, and decision-making abilities that are behind this technology's development.

All of a cyborg's initial adaptation, training, and interaction takes place via Matrix virtual reality, through a CCU's integral commlink. This means that the brain is in a state of total sensory deprivation until it has healed this connection. It also means that jarheads are thoroughly acclimated to Matrix life. Their sole connection to the physical world is through the digital output of their electronic organs, and their constant connection means that they are always in hot-sim VR. A cyborg is not interfaced with a drone body until the brain has reached an acceptable level of training and development. Once adaptation is completed, it is simple to plug a jarhead into a prepared vehicle or drone. From transplant to deployment typically takes 3 to 6 months.

Shackled to the Machine

While active, a jarhead is subject to constant stimulation from a cocktail of neurotransmitters and hormones. This keeps the brain in a constant state of alert. Any time that the cyborg's brainwave sensors detect boredom, it varies the intensity of its sensory output or adjusts the chemistry of the brain's nutrient bath to trigger an increase in attentiveness. The consequence of a jarhead's heightened state is that the cyborg requires a rest period at the end of each shift as a sleep analog. The amount varies depending upon the individual brain and its time in service. Typically, this is at least 8 hours of rest. In addition, weekly down time is required so that a field support technician can perform routine maintenance. This maintenance includes medical testing, VR training, and socialization periods. Most of this socialization is conducted over the Matrix, but some is face to face with fellow employees or even—for the most "normal" looking cyborgs—the unwitting public.

Man Meets Machine

Anthroform drones generally make it easier for cyborgs to function in environments designed for metahumans. Such drones are always equipped with at least two arms ending in hands and fingers to allow for fine manipulation. Frequently these limbs will have additional features integrated (e.g., cyberguns).

Typically, though, even a cyborg in a humanoid body will be identifiable as inhuman. While they are more intuitive and quicker on their feet than a drone's Pilot program, cyborgs remain 0.1 Essence metahumans permanently locked in robotic bodies. With the exception of rare and expensive customizations, the metallic frame, odd mannerisms, and synthetic voice will stand out even among a group of street samurai. Similarly, a jarhead's movements, personality, and decision-making ability are all obviously distinct from those of even the most sophisticated traditional drones.

To allow maximum flexibility, even non-anthroform drones or vehicles are often equipped with at least one robotic manipulator arm.

CYBORGS VS. FULL CYBERLIMB REPLACEMENT

Cyborg technology was developed to circumvent the prohibitive Essence and nuyen costs of full body cybernetic replacements. The latter—full delta-grade limb, torso, and skull replacement—is also available in the Sixth World and can be achieved for less than a million nuyen, with plenty of Essence left over for additional cyber- and bio-implants. Even with the advent of integrated cybersuites and modular limbs, however, costs are considered prohibitive and the investment deemed inefficient for anything but experimental purposes.

Comparatively, CCUs make the metahuman form and biology—natural and artificial—redundant. CCU cyborgs make the most of the potential performance of electromechanical drone bodies for a fraction of the cost of equivalent metahuman augmentations and without the inherent limitations of biological and metabolic systems.

The metahuman, social, and mental costs on the subject are another issue entirely. The procedure is irreversible. An individual with full cyber replacement is still recognizably metahuman; a jarhead (even one with an adult brain) is decidedly not.

Urgent Message...



CYBORG SPECS

While a cyborg follows the rules for vehicles and drones most of the time, most drone bodies, particularly anthroforms, can be handled as normal characters in combat (with the relevant stat adjustments). The following sections cover the basic differences between cyborgs and normal characters and provide guidelines on how to resolve mechanics issues or situations beyond those typically encompassed by the drone rules.

Attributes and Initiative

Jarheads are controlled by a living brain and may use their own Mental attributes as appropriate. Cyborgs using drone bodies do not have Physical attributes like other characters, instead substitute the following as needed:

- Use the drone's Body when a Strength attribute is required.
- Use an appropriate Vehicle skill (+ the drone's Handling modifier) when an Agility attribute is required.
- Use the Response rating of the cyborg's integral commlink when a Reaction attribute is required.
- Use Intuition + Response (instead of Pilot + Response) when determining Initiative.
- Cyborgs have 4 Initiative Passes.
- Use the lower of either Sensor or Intuition for Perception Tests.
- Use the drone's Speed (expressed in meters per Combat Turn) as the cyborg's Movement Rate in tactical combat.

THE CUTTING EDGE



Combat and Movement

When moving or involved in combat, cyborgs can be handled as drones and may be involved in vehicular tactical combat or chase combat per the rules on pp. 160–162, *SR4*. Note that cyborgs are exempt from spending one Complex Action per turn to drive their drone body.

Anthroform drones, in particular, can use normal character combat rules with few modifications (see below).

Hardwired

A CCU includes an integral hot-sim modified commlink, a simsense booster implant and a control rig. This means a cyborg is always considered to be “jumped in” to its current drone body in hot-sim VR, boasts 4 Initiative Passes, and benefits from a permanent +2 dice pool modifier to Vehicle skill tests (and hence, to any Agility-related tests).

The downside of this technology is the fact that any time the drone takes Physical damage, the jarhead will be subject to bio-feedback stun (p. 239, *SR4*). CCUs are designed to compensate this damage by altering the brain’s biochemical environment—effectively acting as a Rating 6 damage compensator (p. 340, *SR4*).

Additionally, a cyborg has no Physical condition monitor of its own. If the drone body is destroyed and the CCU is unable to maintain the brain’s physiological environment, it may die (subject to the gamemaster’s discretion).

Skills

One of the advantages of cyborgs over normal drones is skill learning and use. Instead of autosofts, some jarheads can possess and develop their own skill sets, and may complement these with skillsofts. Cyborg-adaptation of drones includes cybernetic skillwires (Rating 5)—in practice a specialized move-by-wire system hardwired to the CCU—which can run normal skillsofts accessed through the CCU’s onboard commlink. Using normal skillsofts in a drone body of distinctly non-metahuman (i.e., anthroform)

design, however, results in a –2 dice pool modifier—appropriate cyborg skillsofts exist but double normal costs and availabilities.

Most cyborgs must rely on skillsofts extensively, as they have had limited opportunity to learn how to do things via traditional training before being deployed. Full-grown adult brains retain their own skills and after a transition and adaptation period (a few months) may use them at their normal levels.

Targeting and Magic

Cyborgs are difficult to target with magic. The only living part of a jarhead—the brain—is encapsulated within the CCU which itself is enclosed within the drone body, where it is effectively safe from spell targeting. Instead, the drone body itself must be targeted by spells. Only in the event that the drone’s outer casing/armor is breached or removed would the CCU/brain become vulnerable to magical targeting—though hitting might still require a called shot.

This means that spells cast against a cyborg’s drone body must overcome Object Resistance (Threshold 4+). This also means that the cyborg—or rather, its body—does not make resistance rolls against Physical spells. Mana spells are simply unable to lock on to the cyborg’s living component and are useless as a result.

When viewed from the astral, the living presence within a cyborg cannot be seen through the opaque drone body (unless the astral form sticks its head through the drone body’s shadow and into the brain’s encapsulated aura). Cyborgs do not boast the vibrant aura indicative of a living being and instead appear as drab as any other drone to assensing. Assensing may reveal information as it does with any other non-living object, but it will provide no insight into the brain controlling the drone. Unsurprisingly, the Awakened typically find cyborgs disquieting.

Maintenance and Power

A cyborg requires a weekly maintenance session with shop-level equipment. This maintenance involves resupplying organic chemicals, refueling the drone body, and checking vitals on the living brain. Expendable reagents required for this maintenance cost 2,000 Nuyen per week. These routine procedures also review the CCU’s sim levels and pharmaceutical infusions over the course of its activities—these must be monitored to ensure it is operating within accepted parameters. Extended exposure to unsafe levels of either chemical or electronic feedback can have serious psychological and physiological consequences.

Maintenance sessions require a Cybertechnology + Logic (20, 30 minutes) Test at least once a week. Each missed maintenance session increases the threshold of its monthly Sanity Test (see below) by 1.

Transferring a CCU into a new drone body is a simple matter of plugging and unplugging that takes less than a minute, assuming the technician has authorized access to the drone bodies in question. The cyborg requires at least a day to familiarize itself with a new body, suffering a –2 to –6 dice pool modifier on all actions until then, at the gamemaster’s discretion.

COMMON RIGGING TESTS

As with any rigger jumped into a drone, make the following substitutions for common tests:

- **Attack:** Gunnery + Sensor*
- **Defense:** Response
- **Dodge:** Dodge + Response
- **Damage Resistance:** Body + Armor
- **Infiltration:** Infiltration + Response
- **Initiative:** Response + Intuition (modified by Simsense Booster and IPs)
- **Maneuvering:** Vehicle skill + Response
- **Perception:** Perception + (Sensor or Intuition, whichever is lower)

* Cyborgs using anthroform bodies may use the relevant weapon skill for any weapon they wield instead of Gunnery.

Urgent Message...

THE CUTTING EDGE...

Hacking

A CCU's integral commlink is vital to a cyborg. While the drone itself is physically interfaced with the CCU and the two are considered a single node, it's the commlink's wifi capability that provides the jarhead with a connection to the outside world. The CCU's integral commlink may operate normally in Active, Passive, and Hidden modes, and its wifi function may even be shut down on command (a Free Action) without affecting control of the drone body. If the commlink is hacked and compromised, however, the brain may become a prisoner in its drone body. To defend against this, cyborgs always have high rating commlinks with high level Systems, Firewalls, and other defensive software.

Most cyborgs are capable hackers. The Matrix is their natural environment and they typically learn to manipulate it long before they learn to walk in their new bodies. A cyborg is still limited in its ability to deal with simultaneous combat in the physical world and the Matrix, however. Treat this as a hacker active in multiple (2) nodes (p. 232, *SR4*).

Psychology and Inhuman Behavior

A jarhead's brain exists in an artificial and inherently unstable environment; it goes through frequent cycles of extended sensory deprivation, is subjected to dramatic changes of physical identity, and is constantly pumped full of psychotherapeutic chemicals. As a result, the mind will frequently develop a variety of psychoses, represented by Negative mental qualities (see *Cyborg and Cyberzombie Negative Qualities*, p. 163). These reflect the unbalancing and dehumanizing effect of such an extreme conversion and serve as hooks for role playing.

The most common psychoses are phobias and manias. Even after short tours of service, cyborgs can accrue a number of minor fears and obsessions or one or two severe ones.

Each month, a cyborg must make a Sanity Test: a simple Willpower + Intuition (1) Test. The threshold increases by 1 for every maintenance session (see above) missed since the last test. Failure indicates the cyborg has developed or worsened a psychosis, burdening the character with a new 5 BP Negative Quality, or increasing an existing by an additional 5 BPs. Alternatively, a character may choose to permanently lower a Mental attribute and respective maximums by 1 point.

There need not be a logical progression of increased severity with a specific psychosis. Instead, a new and more serious one may simply supplant an existing one. For obvious reasons, the Negative qualities a cyborg accumulates in this manner are invariably mental or psychological in nature.

As these flaws accumulate, the cyborg will need regular psychotherapy sessions added to its maintenance cycles. These sessions can help to overcome existing psychoses and slow the accumulation of new ones. For game purposes, this is accomplished by buying off the Negative quality with Karma (p. 264, *SR4*).



CYBORGS AS PCS

Cyborg characters are intended primarily as NPC adversaries. Nonetheless, many players may find cyborgs present an exciting roleplaying challenge. Keep in mind that these characters are not balanced with player characters created using the standard character creation system. Using cyborgs as player characters is not recommended. For the gamemaster and gaming group comfortable with this imbalance, here are a few suggestions about accommodating this.

- A cyborg requires access to delta-grade implants. This essential modification raises the entry price of a CCU to 250,000¥. Consequently, cyborgs will need dramatically more than 400 BPs at creation. Should a gamemaster allow a cyborg character into play, it will need to exceed the 50 BP cap allotted for gear purchases. While this can be partially balanced out with appropriate Negative qualities, other characters in the party should probably have access to high Availability items as well.
- Cyborgs do not purchase Physical attributes with BPs. It is recommended that the cost of Mental attributes be doubled at character generation.
- Most cyborgs have very little opportunity for training in their physical bodies. It is recommended that they be restricted on their selection of Active skills. Most skills should be run off of skillsofts.
- Many qualities are irrelevant for a cyborg. Please carefully consider game play consequences before allowing a cyborg to take any of them.
- Due to down-time requirements, a cyborg is restricted in the amount of time they can actively spend on a job. To emulate this, a glitch is always an opportunity for a fuel cell running low.
- Converting an existing character into a cyborg would first require obtaining access to a delta clinic, then arranging the resources (or patronage) to pay for the surgery. For a character that manages both of those, the extensive counseling sessions and drug treatments could make for an interesting roleplaying challenge. After completing those, the character will still need to survive the surgery and the extended sensory deprivation that follows. Continuing upkeep and maintenance also represent a problem.

CYBORG WETWARE

The source of the cyborg's brain has an impact upon its performance and skills. The brain may come from a child, an adult, or a clone grown at normal metabolic rate. Each of these has a distinct set of advantages and disadvantages.

Clonal Brain

A clonal brain is ideally adapted to its drone body. As a result, it receives an additional +1 dice pool modifier to all Vehicle skills. The clonal brain often has little experience with the outside world, however, and consequently it begins with no Knowledge skills. Further, the clonal brain cannot have Active skills higher than Rating 5, with the exception of skills in the Cracking and Electronics skill groups. As all of the brain's life experiences are associated with living inside of the CCU, these subjects are most resistant to developing mental disorders. Clonal brains receive a +2 dice pool bonus to the monthly Sanity Test.

Adult Brain

A transplanted adult brain retains access to all of the skills learned in its meat body. Consequently, the adult brain transfers all of its Active, Knowledge, and Language skills to its cyborg existence. Unfortunately, such brains also have a lifetime of learned physical behaviors associated with their meat bodies—meaning they incur a -1 dice pool modifier to non-skillwire based Combat, Physical, Social, and some Technical skills (those based on physical rather than mental activity).

As with the other brain types, an adult brain cannot learn new Active skills to a value higher than the rating of its drone's skillwires (5), but it may advance pre-existing skills beyond this level. Adult brains also have a harder time adapting to the unstable environment of a CCU. As a consequence, these brains receive a -2 dice pool penalty to the monthly Sanity Tests.

Child Brain

A child's brain is a compromise between the experience of an adult brain and the blank slate of a clone's brain. Most of the brain's memories are repressed through a combination of hypnotherapy, magic, and pharmaceuticals. However, Language and any relevant Active skills are transferred to its new life as a cyborg. Cyborgs created from a child's brain are more able to adapt to their new bodies, and so suffer no penalties to its use. Active skills are capped at Rating 5. These cyborgs suffer no penalty on the monthly Sanity Tests.

CYBORG HARDWARE

Rules for modifying a drone to carry a cyborg CCU unit will appear with future vehicle modification rules. The gamemaster may allow any vehicle or drone modification if he deems it appropriate. Given their drone bodies, cyborgs are much denser than a normal metahuman and as a result are not naturally buoyant in water. Unless equipped with some sort of flotation device, a cyborg will sink to the bottom of any body of water. While their internal resources should prevent them from drowning, the time frame for a recovery will be limited by their maintenance requirements. Likewise, cyborgs do not breathe, eat, or have skin, so they are immune to toxins (unless somehow applied directly to the brain).

Cranial Containment Unit (CCU)

The CCU should be considered delta-grade cyberware (costs pre-figured) even though, in practice, it's the metahuman brain that is installed into the device and not the other way round. The CCU is typically an oval or cylindrical unit 50 centimeters long and 30 centimeters in diameter. The device incorporates an on-board Response 4, Signal 4 commlink (which may be upgraded as normal, see p. 240, *SR4*) modified for hot sim, as well as a simsense booster (p. 37) and control rig (p. 331, *SR4*).

Transplanting an adult brain into a CCU requires removing any pre-existing implants (with the possible exception of cultured bioware, at the gamemaster's discretion). This removal may be considered part of the surgery. In addition to requiring delta-grade medical facilities, the brain transplant surgery requires a Medicine (Transplant Surgery) + Logic (20, 1 hour) Extended Test. At the end of the surgery, the cyborg is left with an Essence of 0.1.

Removing the brain from its original body and implanting it into a CCU completely and permanently disrupts the individual's magical or technomantic abilities. Any character who undergoes this procedure automatically has his Resonance or Magic attribute reduced to zero.

A CCU includes all of the necessary medical support equipment to keep the brain it contains alive.

CYBORG AND CYBERZOMBIE NEGATIVE QUALITIES

Due to their conditions, jarheads and cyberzombies develop a number of unique psychoses, physical disorders, and even magical side-effects. These translate to the mental, physical, and magical Negative qualities listed below. Other applicable Negative qualities from *Shadowrun, Fourth Edition*, include Addiction, Allergy, Astral Beacon, Bad Luck, Gremlins, and Weak Immune System. Given their condition, cyborgs will only ever develop mental Negative qualities.

Some of the following qualities may also be applicable to non-cyborg or cyberzombie characters, though the gamemaster should use his discretion on which to allow in his game.

Assensing Rejection

Bonus: 10 BP

Not all minds are capable of processing astral information even when it is thrust upon them. These characters are incapable of consciously acknowledging what their astral senses tell them. This means that the results of any Assensing Tests are not told to the player. The character is still roughly aware of the presence of spirits and other astral forms, but cannot explain why she knows this information, even to herself.

Chronic Dissociation Syndrome (CDS)

Bonus: 10 BP

CDS is the most common psychological ailment afflicting cyborgs and cyberzombies. In cyborgs, CDS is thought to be the result of the extended sensory deprivation and lack of social interaction, leading to depression and passivity. In cyberzombies it is thought to be rooted in the severing of the spirit/body bond at the moment of death and the erosion of the sense of identity this provokes. The primary symptom is a loss of identity manifesting as a sense of indifference and detachment towards one's surround-

ings, relations, and interests. Even a functional invoked memory stimulator will not stop the intense apathy and depression associated with CDS taking hold. These characters suffer a -3 penalty on any Willpower Tests other than Spell and Damage Resistance Tests.

Delusion

Bonus: 10 BP

The character has a firmly-held belief that has no basis in fact. No amount of logical argument or persuasive charm will dissuade the character from this belief. The delusion will be an inconvenience to the character in most social situations and may be an inconvenience during a shadowrun. Any time that reality contradicts the delusion, the character will come up with an explanation why the delusion only appeared to be false. Examples include an imaginary friend or foe, belief in the power of a "lucky" charm, or knowledge of a global conspiracy between dragons and elves.

Dementia

Bonus: 20 BP

The character has entered a downward spiral of cognitive function loss. Symptoms vary from patient to patient and often from day to day. They can include memory loss, delusions, hallucinations, and loss of language skills. Individuals suffering from dementia have good days and bad days. To reflect this, at the start of each new scene, have the character make a Willpower + Logic Test and consult the Dementia Table.

DEMENTIA TABLE	
Hits	Symptoms
Glitch	The character is catatonic.
0	The character feels physically lost, and is uncertain of what year it is.
1	The character has lost all memories associated with the current mission.
2	The character has all Language skills reduced to 1 until the end of the scene.
3	The character is distracted (-1 to all actions) by a compulsion to find a missing object.
4	None

Emotion Leak

Bonus: 10 BP

Cyberzombies and cyborgs often have a difficult time containing their emotions; other metahumans know instinctively how these characters feel. This is disadvantageous during negotiations, cons, gambling, and any other face to face interactions where deception is important. In such dealings, the character is at a -2 dice pool penalty if the other person is physically present.

Hallucinations

Bonus: 20 BP

In stressful situations, the character must pass a Willpower + Logic (3) Test or be subjected to hallucinatory visions. These



visions may come from past experiences, nightmares, or even the media. They may also reflect a failure to observe something that does exist. To the character, these seem every bit as real as the physical world around them, and must be addressed appropriately. These visions exist only within the mind of the character. They have no Astral or Matrix component.

The visions will persist until the character successfully passes another Willpower + Logic (3) Test; the gamemaster determines when such tests are made. Another character may assist the hallucinating character by using Logic + Psychology (treat as a teamwork test).

Mania/Phobia

Bonus: 5 to 25 BP

A character with a mania or a phobia has a debilitating reaction to a situation or object. Manias deal with obsessions with a particular object or situation. Phobias deal with fears of specific objects or situations. Both can vary dramatically based upon the

severity of the reaction and the commonality of the object. The value of the negative quality is based upon both of these factors. Determine whether the trigger is Uncommon (2 BP) or Common (7 BP). Then, determine the severity of the symptoms: Mild (3 BP), Moderate (8 BP), or Severe (13 BP). Add the appropriate point values to find the final BP value. For example, the value of an Uncommon Moderate Phobia is 10 (2 + 8) points. The Phobia/Mania Table gives descriptions of triggers and severity.

Multiple Personality Disorder (MPD)

Bonus: 20 BP

The character has two or more personalities present in his mind. These different personalities will not all have access to all of the character's skills or memories. During stressful situations, the character must make a Willpower + Charisma (3) Test or switch personalities. In the event of a personality change, the character must make a Willpower + Charisma (8, 1 minute) Extended Test. Until that test is completed, the new personality cannot act. When this psychosis is taken, the player must divide the character's skill lists into two groups. No more than half of the skills can be shared by both personalities.

Obsessive-Compulsive Disorder (OCD)

Bonus: 10 BP

A particularly common mania, some cyborgs and cyberzombies become so focused on their expanded senses that they almost forget to synthesize their sensory data into a coherent whole and become lost in the details. These characters are at least as good as normal when searching for minor details and clues, but they suffer a -4 penalty on Perception Tests to notice big picture events. Such a character would have a normal chance to spot a hidden firearm, but could easily miss a troll running into the room with a flamethrower.

Uncontrolled Metastasis

Bonus: 10 or 20 BP

The apoptotic inhibitors that keep a cyberzombie alive can keep tumors alive as well. A cyberzombie with uncontrolled metastasis develops a lot of cancer. At 10 BP, tumors grow at a steady but slow rate and the patient must undergo regular surgery or nanotech treatment every month to remove cancerous growths or become violently ill (effectively incapacitated). At 20 BP, metastasis is such that tumors and cancerous tissues are simply impossible to eradicate entirely with the requisite monthly surgeries (though these must still be performed). The resulting physical deformities and growths saddle the subject with a permanent -2 dice pool modifier to any tests involving in-the-flesh social interactions.

Will to Die

Bonus: 10 BP

A cyberzombie is not supposed to be alive, and some part of her is willing death upon herself even at the best of times. Characters with this quality find themselves slipping into real death easier than normal. All Healing Tests are made with a -2 dice pool penalty, and the character has three less damage overflow boxes.

MANIA/PHOBIA TABLE

Condition	Value	Description
Uncommon	2	The trigger is rare for the campaign. Examples: Being Alone (Autophobia), Strangers (Xenophobia), Gambling (Ludomania), Fires (Pyromania)
Common	7	The trigger is common for the campaign. Examples: Darkness (Noctiphobia), Heights (Acrophobia), Counting (Arithmomania), Stealing (Kleptomania)
Mild	3	The character suffers an uncomfortable need to interact with or avoid the trigger. Apply a -2 dice pool modifier to all tests made while a character is exposed to it.
Moderate	8	Exposure to the trigger is extremely distracting for the character. When in the presence of the trigger, apply a -4 dice pool modifier to all tests. Characters with a mania will crave exposure at least once per day. Characters with a phobia of this level will put themselves at risk to avoid it.
Severe	13	Exposure to the trigger is incapacitating. When in the presence of the trigger, the character must apply a -4 dice pool modifier to all tests. In addition, during exposure, the character must pass a Willpower + Intuition (3) Test in order to perform any action that does not deal directly with the trigger.

IMPLANT GRADES

Grade	Essence Cost Multiplier	Availability Modifier	Cost Multiplier
Standard	1	—	1
Second-hand	1.2	-1	0.5
Alphaware	0.8	—	2
Betaware	0.7	—	4
Deltaware	0.5	—	10

CYBERWARE

Cosmetic Cyberware Modifications	Essence	Capacity	Availability	Cost
Cybergland	0.1	—	+4	500¥ + 100¥ per extra dose (max. 6)*
Cyberlimb Casemod				
Full Arm/Leg	—	—	+2	+400¥
Lower Arm/Leg	—	—	+2	+300¥
Hand/Foot	—	—	+3	+250¥
Torso	—	—	+4	+1,200¥
Skull	—	—	+4	+1,000¥
Engraved Datajack	—	—	+2	+200¥
Eyemod	—	—	+3	+500¥
Shaped Dermal Plating	—	—	+5	+1,200¥
Wet Sheath	—	—	+2	+1,300¥

* Does not include the costs of the drug/compound.

Cosmetic Cyberware Implants	Essence	Capacity	Availability	Cost
Breast Implants (pair)	0.25	[2]	4	3,000¥
Fang Implants (pair)	0.1	[1]	6	800¥
Extendable	0.15	[1]	8	1,200¥
Fiberoptic hair	0.1	[1]	—	450¥+
Horn Implants (pair)	0.15	[1]	8	1,500¥
Retractable	0.25	[1]	10	2,200¥
Penile Implant	0.25	[1]	5	3,000¥

Headware	Essence	Capacity	Availability	Cost
Attention Coprocessor (Rating 1-3)	0.3	—	8	Rating x 3,000¥
CommLink	0.2	[2]	—	2,000¥ + CommLink Cost
Control Rig	0.5	—	8	10,000¥
Cranial Bombs				
Kink Bomb	0	[1]	16F	2,000¥
Microbomb	0	[2]	16F	5,000¥
Area Bomb	0	[3]	20F	10,000¥
Data Filter	0.2	—	12	2,500¥
Datajack	0.1	[1]	—	500¥
Data Lock	0.1	[1]	12	1,000¥ + Encryption
Encephalon				
Rating 1	0.75	—	8	30,000¥
Rating 2	1.5	—	10	75,000¥
Invoked Memory Stimulator	0.2	—	24	50,000¥
Math SPU	0.15	—	9	4,500¥
Olfactory Booster (Rating 1-6)	0.2	[2]	Rating x 4	Rating x 1,000¥
Orientation System	0.2	[1]	4	1,250¥
Radar Sensor (Rating 1-4)	0.3	[2]	12	Rating x 3,000¥
Sim Module	0.2	[2]	—	2,000¥
Hot-Sim Modified	0.2	[2]	12F	5,000¥
Simsense Booster	0.5	—	8	65,000¥
Taste Booster (Rating 1-6)	0.2	—	Rating x 4	Rating x 1,500¥
Tooth Storage Compartment	—	—	8	200¥



Headware	Essence	Capacity	Availability	Cost
Tooth Breakable Compartment	—	—	12	500¥
Ultrasound Sensor	0.3	[2]	10	6,000¥
Voice Modulator	0.2	—	4	7,500¥
Secondary Pattern (Rating 1–6)	—	—	(Rating x 3)F	Rating x 5,000¥

Eyeware	Essence	Capacity	Availability	Cost
Cybereyes Basic System				
Rating 1	0.2	4	—	500¥
Rating 2	0.3	8	4	750¥
Rating 3	0.4	12	6	1,000¥
Rating 4	0.5	16	8	1,500¥
Eyeband				
Rating 1	0.3	6	4	800¥
Rating 2	0.4	8	6	1,000¥
Rating 3	0.5	12	8	1,250¥
Eye Laser System				
Eye Laser Designator	—	—	12R	1,000¥
Eye Laser Microphone (Rating 1–3)	—	—	12R	Rating x 500¥
Eye Laser Range Finder	—	—	10	1,000¥
Eye Tool Laser	—	[6]	10R	2,000¥
Eye Light System	0.1	[2]	6	750¥
Eye Recording Unit	0.1	*	4	2,000¥*
Flare Compensation	0.1	[1]	4	750¥
Image Link	0.1	*	4	500¥*
Low-Light Vision	0.1	[2]	4	1,000¥
Microscopic Vision	0.2	[3]	4	1,300¥
Ocular Drone	—	[6]	6	3,000¥
Protective Covers	—	—	4	100¥
Retinal Duplication (Rating 1–6)	0.1	[1]	16F	Rating x 15,000¥
Single Cybereye				
Rating 1	0.1	2	—	300¥
Rating 2	0.15	4	4	450¥
Rating 3	0.2	6	6	600¥
Rating 4	0.25	8	8	900¥
Smartlink	0.1	[3]	8R	1,000¥
Thermographic Vision	0.1	[2]	4	1,000¥
Vision Enhancement (Rating 1–3)	0.1	[Rating]	Rating x 3	Rating x 1,500¥
Vision Magnification	0.1	[2]	4	1,000¥
Voice Mask	0.1	—	7F	3,000¥

* Included in the Cybereyes basic system.

Earware	Essence	Capacity	Availability	Cost
Cyberears				
Rating 1	0.2	4	—	500¥
Rating 2	0.3	8	4	750¥
Rating 3	0.4	12	6	1,000¥
Rating 4	0.5	16	8	1,500¥
Audio Enhancement (Rating 1–3)	0.1	[Rating]	Rating x 3	Rating x 1,500¥
Balance Augmenter	0.1	[4]	10	5,000¥
Damper	0.1	[1]	4	750¥
Ear Recording Unit	0.1	*	4	500¥*
Increased Sensitivity	0.1	[1]	6	1,000¥
Select Sound Filter (Rating 1–6)	0.1	[Rating]	Rating x 3	Rating x 1,000¥
Sound Link	0.1	*	—	250¥*
Spatial Recognizer	0.1	[2]	8	750¥

* Included in the Cyberears basic system.



Bodyware	Essence	Capacity	Availability	Cost
Auto-Injector				
Reusable (1 dose)	0.1	[0]	4	500¥ + contents
One-shot (1 dose)	0.05	[0]	8	700¥ + contents
Extra Dose Capacity (Max 6)	—	[0]	—	+100¥ per dose
Balance Tail	0.5	—	9	5,500¥
Biomonitor	0.3	[1]	4	1,000¥
Blood Circuit Control System	1	—	15	30,000¥
Bone Lacing				
Aluminum	1	—	12F	15,000¥
Ceramic	1.2	—	12F	22,500¥
Kevlar	1	—	10F	10,000¥
Plastic	0.5	—	8F	5,000¥
Titanium	1.5	—	16F	40,000¥
Cosmetic Modification	—	—	2–12	200¥–10,000¥
Cyberfins	0.3	[3]	9	3,500¥
Cyber Safety	—	[1]	7	350¥
Dermal Plating (Rating 1–3)	Rating x 0.5	—	(Rating x 5)R	Rating x 5,000¥
Dermal Sheath				
Rating 1	0.6	—	8	10,000¥
Rating 2	1.0	—	12	20,000¥
Rating 3	1.6	—	16	40,000¥
Ruthenium Polymer Coating	—	—	+2	+2,500¥
Chameleon Modification	+ 0.2	—	+4R	+4,000¥
Fingertip Compartment	0.1	[1]	4	750¥
Flex Hands	0.3	—	10	3,500¥
Foot Anchor	0.4	[3]	10	4,000¥
Gastric Neurostimulator	0.2	—	6	2,500¥
Grapple Gun	0.5	[5]	8	1,500¥
Grip Feet	0.3	[2]	10	6,000¥
Internal Air Tank	0.25	[3]	4	650¥
Magnetic System	0.25	[2]	8	1,200¥
Move-by-Wire System				
Rating 1	2	—	12R	50,000¥
Rating 2	3	—	18R	85,000¥
Rating 3	5	—	25F	175,000¥
Muscle Replacement (Rating 1–4)	Rating x 1	—	(Rating x 5)R	Rating x 5,000¥
OXSYS Cybergill	0.25	—	6	4,500¥
Reaction Enhancers (Rating 1–3)	Rating x 0.3	—	(Rating x 5)R	Rating x 10,000¥
Retractable Climbing Claws	0.2	[2]	8	2,200¥
Simrig	0.5	—	8	5,000
Skillwires (Rating 1–5)	Rating x 0.2	—	(Rating x 4)	Rating x 2,000¥
Skillwire Expert System	0.1	—	8	3,000¥
Smart Articulation	0.8	—	6	15,000¥
Smuggling Compartment	0.2	[2]	6	1,500¥
Touch Link	0.1	—	6	1,000¥
Wired Reflexes				
Rating 1	2	—	8R	11,000¥
Rating 2	3	—	12R	32,000¥
Rating 3	5	—	20R	100,000¥

Cyberlimbs	Essence	Capacity	Availability	Cost
Obvious Limbs				
Full Arm	1	15	4	15,000¥
Full Leg	1	20	4	15,000¥
Hand/Foot	0.25	4	2	5,000¥
Lower Arm	0.45	10	4	10,000¥
Lower Leg	0.45	12	4	10,000¥
Torso	1.5	10	12	20,000¥
Skull	0.75	4	16	10,000¥

Cyberlimbs	Essence	Capacity	Availability	Cost
Synthetic Limbs				
Full Arm	1	8	4	20,000¥
Full Leg	1	10	4	20,000¥
Hand/Foot	0.25	2	2	6,000¥
Lower Arm	0.45	5	4	12,000¥
Lower Leg	0.45	6	4	12,000¥
Torso	1.5	5	12	25,000¥
Skull	0.75	2	16	15,000¥

Customized Cyberlimbs	Essence	Capacity	Availability	Cost
Each BOD, STR, or AGI point above 3	as cyberlimb	as cyberlimb	+1	+1,500¥

Cyberlimb Enhancements	Essence	Capacity	Availability	Cost
Armor (Rating 1–4)	—	Rating x 2	Rating x 5	Rating x 300¥
Body (Rating 1–7)	—	Rating x 1	(Rating x 3)R	Rating x 200¥
Strength (Rating 1–7)	—	Rating x 1	(Rating x 3)R	Rating x 250¥
Agility (Rating 1–7)	—	Rating x 1	(Rating x 3)	Rating x 250¥

Bulk Modification	Essence	Capacity	Availability	Cost
Each Increased Capacity Point (Max. 4)	—	+1	+1	+1,000¥

Optimized Cyberlimb	Essence	Capacity	Availability	Cost
All models	per cyberlimb	-2	+4	+5,000¥

Cyberlimb Accessories	Essence	Capacity	Availability	Cost
Cyberarm Gyromount	—	[4]	12F	6,000¥
Cyberarm Slide	—	[8]	12R	3,000¥
Cyber Holster	—	[7]	8R	2,000¥
Cyberskates (pair)	—	[3]	5	650¥
Hydraulic Jacks (Rating 1–6)	—	[Rating per limb]	9	Rating x 2,000¥ (total)
Large Smuggling Compartment	—	[5]	6	2,000¥
Scanner System (Rating 1–4)	—	[2]	6R	Rating x 500¥
Snake Fingers (per hand)	—	[1]	6	1,000¥
Telescoping Cyberlimb (per limb)	—	[2]	6	2,500¥

Modular Cyberlimb	Essence Cost Multiplier	Availability Modifier	Cost Multiplier
Modular Cyberlimb	1	+1	1.1

Modular Plug-In	Replaced Limb	Availability	Cost
Built-in Utility Kit	Lower Arm	6	1,500¥
Built-in Medkit	Hand	7	1,000 + (Rating x 100¥)
Drone Hand	Hand	8	3,500¥
Grapple Hand	Lower Arm	12R	3,000¥
Hydraulic Press	Lower Arm	8	5,000¥
Jackhammer	Lower Arm/Leg	8	5,000¥
Nail Pistol	Hand	8	900¥
Raptor Cyberlegs (pair)	Lower Legs	12	25,000¥ (both)
Skimmer Discs (pair)	Feet	8	5,000¥ (both)
Vacuum Pump	Hand	6	4,000¥
Waterjets (pair)	Feet	8	3,000¥
Welding Laser	Hand	10R	3,000¥

CYBERWEAPONS

Cyberguns	Essence	Capacity	Availability	Cost
Holdout Pistol	0.15	[2]	12R	800¥
Light Pistol	0.35	[4]	14R	1,500¥
Machine Pistol	0.4	[4]	16R	2,000¥
Heavy Pistol	0.6	[6]	16R	3,200¥
Submachine Gun	1	[10]	20R	2,500¥
Shotgun	1.1	[11]	20R	2,100¥
Grenade Launcher	1.5	[15]	20F	4,000¥
External Clip Port	0.1	[1]	—	100¥
Laser Sight	0.1	[1]	—	100¥
Silencer	0.2	[2]	—	400¥
Sound Suppressor	0.3	[3]	—	600¥

Melee Cyberweapons	Essence	Capacity	Availability	Cost
Handblade (Retractable)	0.25	[3]	10F	1,500¥
Hand Razors (Retractable)	0.2	[2]	10F	900¥
Spur (Retractable)	0.3	[3]	12F	1,800¥
Shock Hand	0.25	[3]	8R	1,000¥

Other Cyberweapons	Essence	Capacity	Availability	Cost
Dartgun	0.35	[3]	12R	1,400¥
Eye/Oral Dart	0.25	[3]	14R	1,500¥
Fingertip Dartgun	0.45	[4]	16R	2,750¥
Oral Gun	0.25	[3]	14R	1,600¥
Oral Slasher	0.25	[3]	12R	1,500¥
Projectile Spur	0.3	[4]	12F	2,200¥
Squirtgun	0.3	[4]	10R	1,250¥
Taser	0.3	[3]	8R	1,000¥
Cyberweapon Mounts				
Articulated Weapon-Arm	—	[8]	24F	5,000¥
External Mount	—	[7]	16F	2,500¥

CYBER MELEE WEAPONS

Blades	Reach	Damage	AP
Hand Blade	—	(STR ÷ 2 + 2)P	—
Hand Razors	—	(STR ÷ 2 + 1)P	—
Retractable Climbing Claws	—	(STR ÷ 2)P	—
Shock Hand	—	6S(e)	-half
Spurs	—	(STR ÷ 2 + 3)P	—
Exotic Melee Weapons			
Fang Implants	—	(STR ÷ 2)P	—
Horn Implants	—	(STR ÷ 2 + 1)P	—
Hydraulic Press Plug-In (strike)	—	(STR ÷ 2 + 1)P	—
Hydraulic Press Plug-In (pinch)	—	10P	-4
Jackhammer Plug-In (ram)	—	6P	—
Jackhammer Plug-In (drill)	—	6P	-2
Oral Slasher	—	4P	-2
Unarmed Combat Attack			
Aluminum Bone Lacing	—	(STR ÷ 2 + 2)P	—
Ceramic Bone Lacing	—	(STR ÷ 2 + 2)P	—
Plastic Bone Lacing	—	(STR ÷ 2 + 1)P	—
Titanium Bone Lacing	—	(STR ÷ 2 + 3)P	—



CYBER RANGED WEAPONS

Cyberguns	Damage	AP	Mode	Blast	RC	Ammo
Cyber Hold-Out	4P	—	SS	—	—	2 (m)/6 (c)
Light Cyber Pistol	4P	—	SA	—	—	12 (m)/12 (c)
Cyber Machine Pistol	4P	—	SA/BF	—	1	12 (m)/35 (c)
Heavy Cyber Pistol	5P	-1	SA	—	—	10 (m)/10 (c)
Cyber Submachine Gun	5P	—	SA/BF	—	2	12 (m)/24(c)
Cyber Shorgun	7P	-1	SA	—	—	10 (m)/10 (cy)
With Flechettes	9P(f)	+2				
Cyber Microgrenade Launcher	as grenade	—	SS	-2/meter	—	2 (m)/6 (c)

Other Ranged Cyberweapons	Damage	AP	Mode	Blast	RC	Ammo
Dartgun	3P	—	SA	—	—	5 (m)
Eye/Oral Dart	2P	—	SS	—	—	1
Eye Tool Laser	3P	-half	SS	—	—	10 (battery)
Fingertip Dartgun	3P	—	SA/FA*	—	—	5 (m)
Grapple Hand Plug-In	5S	—	SS	—	—	1 (ml)
Nail Pistol Plug-In	4P	—	SA	—	—	30 (c)
Oral Gun	4P	—	SS	—	—	4 (m)
Projectile Spur	7P	-2	SS	—	—	1
Squirtgun	Chemical	—	SA	—	—	10 (m)/15 (c)
Taser	6S(c)	-half	SA	—	—	4 (m)
Welding Laser Plug-In	5P	-half	SS	—	—	10 (battery) or external

* One Long Burst only (see description).

Ammunition, Per 10 Shots	Armor Used	Availability	Cost
Darts	I	8R	15¥

CYBERWARE-RELATED GEAR

Gear	Availability	Cost
Modular Plug-in Adaptation	+2	+500¥

Firearm Accessory	Mount	Availability	Cost
Cyber Safety	—	6	200¥

CYBERWARE SUITES

Cyberware Suite	Essence	Availability	Cost
Lone Star SWAT (standard)	2.52	12F	16,875¥
Watchman Version (alphaware)	2.02	12F	33,750¥
Shiawase ExecutiveSuite Line			
Silverline (alphaware)	0.76	11	47,700¥
Goldline (betaware)	0.66	14	95,400¥
S-K Cyberlogician			
Standard Civilian Version (alphaware)	1.98	16F	186,480¥
Deluxe Civilian Version (betaware)	1.73	19F	372,960¥
Standard Military Version (alphaware)	2.48	22F	305,730¥
Deluxe Military Version (betaware)	2.17	25F	611,460¥
Urban Kshatriya (standard)	2.43	15F	26,415¥
Alpha Version (alphaware)	1.94	15F	52,830¥
Beta Version (betaware)	1.7	18F	105,660¥
Zeiss SenseSation Line			
Basic Edition (standard)	1.35	12	24,750¥
Livecaster Edition (alphaware)	1.08	12	49,500¥
Executive Edition (betaware)	0.95	15	99,000¥

BIODRONE CYBERWARE

Biodrone Control Cyberware	Essence	Availability	Cost
CAST	0.5	25	25,000¥+
Orientation Goad	0.1	4	500¥
Stirrup Interface			
Rating 1	2.5	15R	45,000¥
Rating 2	3.5	21R	80,000¥
Rating 3	5.5	28R	100,000¥

Special Biodrone Cyberware	Essence	Availability	Cost
TRACES	0.75	25F	25,000¥
SEIES	0.75	25F	20,000¥

BIOWARE

Biosculpting	Essence	Availability	Cost
Minor Modification	0	4	100–2,000¥
Moderate Modification	0.1	6	1,000–5,000¥
Severe Modification	0.3–0.5	6–12	10,000+¥
Metatype Change	0.3	8	25,000¥
Sex Change	0.3	6	20,000¥

Cosmetic Bioware	Essence	Availability	Cost
Chameleon Skin	0.2	6	4,000¥
Dynamic Chameleon Skin	0.2	8	7,000¥
Clean Metabolism	0.1	4	2,500¥
Chloroplast Skin	0.1	4	2,500¥
Dietware	0.1	4	2,500¥
Hair Growth	—	4	500¥
Sensitive Skin	—	4	2,500¥
SilkySkin	—	4	1,500¥
Skin Pigmentation + Biotattoos	—	4	1,500¥

Basic Bioware	Essence	Availability	Cost
Adrenaline Pump (Rating 1–3)	Rating x 0.75	(Rating x 6)F	Rating x 30,000¥
Bone Density Augmentation (Rating 1–4)	Rating x 0.3	12	Rating x 20,000¥
Cat's Eyes	0.1	4	7,500¥
Chemical Gland	0.3	12*	30,000¥ + (compound dose cost x 100¥)
Exhalation Spray	0.1	—	5,000¥
Internal Release	—	—	1,000¥
Spit	0.1	—	3,000¥
Weapon Reservoir	0.1	—	2,000¥
Digestive Expansion	0.5	4	20,000¥
Echolocation	0.1	8	15,000¥
Elastic Joints	0.3	10	15,000¥
Enhanced Articulation	0.3	12	40,000¥
Enhanced Pheromone Receptors (Rating 1–3)	0.1	10	Rating x 5,000¥
Extended Volume (Rating 1–3)	Rating x 0.1	4	Rating x 4,000¥
False Front (Rating 1–4)	Rating x 0.2	(Rating x 4)R	Rating x 12,000¥
Mimic Option	—	+4	+10,000¥
Signal Drug (per dose)	—	8	50¥
Mimic Signal Drug (per dose)	—	12	500¥
Gecko Hands	0.1	6	12,000¥
Gills	0.2	6	12,000¥
Hand and Foot Webbing	0.1	6	6,000¥
Hearing Enhancement	0.1	6	5,000¥
Metabolic Arrester	0.3	8	10,000¥
Muscle Augmentation (Rating 1–4)	Rating x 0.2	(Rating x 5)R	Rating x 7,000¥

* See description



Basic Bioware	Essence	Availability	Cost
Muscle Toner (Rating 1–4)	Rating x 0.2	(Rating x 5)R	Rating x 8,000¥
Nephritic Screen (Rating 1–4)	Rating x 0.1	8	Rating x 10,000¥
Nictitating Membrane	0.1	4	2,000¥
Orthoskin (Rating 1–3)	Rating x 0.25	(Rating x 4)R	Rating x 30,000¥
Dragon's Hide	0.1	4	7,000¥
Electroshock	0.25	4	25,000¥
Sharkskin	0.1	4	5,000¥
Smart insulation	0.1	4	12,000¥
Pathogenic Defense (Rating 1–6)	Rating x 0.1	8	Rating x 10,000¥
Platelet Factories	0.2	12	25,000¥
Quills	0.25	6	2,500¥
Skin Pocket	0.1	4	5,000¥
Spidersilk Gland	0.3	10	40,000¥
Suprathyroid Gland	0.7	20F	45,000¥
Symbiotes (Rating 1–3)	Rating x 0.2	(Rating x 5)	Rating x 10,000¥
Synthacardium (Rating 1–3)	Rating x 0.1	(Rating x 4)	Rating x 10,000¥
Tactile Sensitivity	0.2	8	4,000¥
Tailored Critter Pheromones (Rating 1–3)	Rating x 0.2	(Rating x 4)	Rating x 15,000¥
Tailored Pheromones (Rating 1–3)	Rating x 0.2	(Rating x 4)F	Rating x 15,000¥
Toxin Extractor (Rating 1–6)	Rating x 0.2	(Rating x 3)	Rating x 20,000¥
Tracheal Filter (Rating 1–6)	Rating x 0.2	(Rating x 3)	Rating x 15,000¥
Troll's Eyes	0.1	6	8,000¥
Vocal Range Enhancer	0.1	8	12,000¥

Cultured Bioware	Essence	Availability	Cost
Cerebral Booster (Rating 1–3)	Rating x 0.2	(Rating x 6)	Rating x 10,000¥
Damage Compensators (Rating 1–12)	Rating x 0.1	(Rating x 3)F	Rating x 15,000¥
Mnemonic Enhancer (Rating 1–3)	Rating x 0.1	(Rating x 5)	Rating x 7,500¥
Pain Editor	0.3	18F	40,000¥
Reception Enhancer (Rating 1–3)	Rating x 0.2	Rating x 3	Rating x 20,000¥
Reflex Recorder			
Skill Group	0.2	12	25,000¥
Skill	0.1	10	10,000¥
Sleep Regulator	0.15	8	10,000¥
Synaptic Booster (Rating 1–3)	Rating x 0.5	(Rating x 6)R	Rating x 80,000¥
Thermosense Organs	0.3	10	15,000¥
Trauma Damper	0.2	8R	40,000¥

BIOWARE MELEE ATTACKS

Unarmed Combat Attack	Reach	Damage	AP
Bone Density 1	—	(STR ÷ 2)P	—
Bone Density 2	—	(STR ÷ 2 + 1)P	—
Bone Density 3	—	(STR ÷ 2 + 2)P	—
Bone Density 4	—	(STR ÷ 2 + 3)P	—
Electroshock Orthoskin	—	6S(e)	–half
Quills	—	(STR ÷ 2 + 1)P	+1

SYMBIONTS

Symbiont	Essence	Availability	Cost
Leech Symbiont			
Carapace	0.2	16	30,000¥
Glow	0.2	16	40,000¥
Sac	0.2	24	30,000¥ + (compound dose cost x 100¥)
Endosymbiont			
Booster	0.2	16	30,000¥
Electroreceptor	0.2	12	20,000¥
Mender	0.2	16	40,000¥
Digester	0.2	12	20,000¥

Symbiont	Essence	Availability	Cost
Slimworm	0.2	4	1,000¥
Stalwart	0.2	16	30,000¥

GENETECH

Genetic Restoration	Treatment Time	Essence	Availability	Cost
Age Rejuvenation				
Léonization	3 months+	—	12R	400,000¥
Life-span Expansion	2 months	—	10R	250,000¥
Physical Vigor	2 months	—	10R	350,000¥
Maintenance Session	1 month	—	—	50,000¥
Augmented Healing	1 week–2 months	—	8	15,000¥/week
Cellular Repair	1 week–2 months	—	8	15,000¥/week
Corrective Therapies	1 week	—	4	15,000¥
Revitalization	0.1 Essence per month	—	12	75,000¥ + 20,000¥/month

Phenotype Adjustments	Treatment Time	Essence	Availability	Cost
DNA Masking				
Genewipe	2 months	0.2	16F	60,000¥
Masque	2–3 weeks	0.1	10F	25,000¥
Reprint	1 month	0.1	12F	30,000¥
Shuffle	1 month	0.2	12F	40,000¥
Genetic Optimization	2 months	0.2	10	45,000¥
Phenotypic Alteration	2–6 weeks	0.1–0.2+	8	40,000¥+
Ethnicity Alteration	4 weeks	0.2	8	40,000¥
Print Removal	2 weeks	0.1	8F	25,000¥

Transgenics	Treatment Time	Essence	Availability	Cost
Enhanced Protein Exchange				
Adapsin	1 month	0.2	16	40,000¥
Daredrenaline	2 weeks	0.1	6	40,000¥
Double Elastin	2 weeks	0.2	8	12,000¥
Dynomitan	1 month	0.2	8	30,000¥
Hyper-Glucagon	2 weeks	0.1	6	25,000¥
Magnesense	2 weeks	0.1	6	20,000¥
Neo-EPO	2 weeks	0.2	6	35,000¥
PuSHeD	1 month	0.1	8	15,000¥
Qualia	1 month	0.4	8	40,000¥
Reakt	1 month	0.4	10	45,000¥
Synch	1 month	0.3	8	40,000¥
Vasocon	2 weeks	0.1	6	30,000¥
Vegsin	2 weeks	0.1	6	15,000¥
Environmental Microadaption				
Cold Adaptation	3 months	0.5	6	40,000¥
Heat Adaptation	3 months	0.5	5	40,000¥
Low Oxygen Tolerance	3 months	0.5	4	35,000¥
Microgravity Adaptation	3 months	0.5	4	30,000¥
Pollution Tolerance	3 months	0.3	5	35,000¥
Radiation Tolerance	3 months	0.5	6	35,000¥
Immunization				
Basic Immunity	3 weeks	0.1	4	20,000¥
Allergen Immunization	1 week	0.1	4	5,000¥ x Allergy Value (BP)
Neurotoxin Immunization	1 month	0.2	8R	30,000¥
Soft-Nanite Immunization	3 weeks	0.1	8	25,000¥
Transgenic Alteration				
Alien Look	1–3 months	0.2	10R	40,000¥
Animal Features	1–3 months	0.3	10R	45,000+¥

Genetic Infusions	Availability	Cost	Transgenics	Availability	Cost
All variants	16F	1,000¥	DNArt	10	100,000+¥
			Chimera Pet	6	10,000+¥

NANOTECH

Nanoware	Type	Availability	Cost
Anti-Rad (Rating 1-6)	Hard	10	Rating x 1,500¥
Carcerand Plus (Rating 1-6)	Soft/Hard	6	Rating x 2,500¥ (+drug)
Control Rig Booster (Rating 1-3)	Hard	8	Rating x 5,000¥
Implant Medics (rating 1-6)	Soft/Hard	6	5% of implant cost
Nantidotes (Rating 1-6)	Hard/Soft	8	Rating x 1,000¥
Universal Nantidotes (Rating 1-9)	Hard/Soft	12	Rating x 2,500¥
Nanite Hunters			
Single System (Rating 1-6)	Hard	10R	Rating x 1,000¥
Universal (Rating 1-6)	Hard	16R	Rating x 2,500¥
Nanosymbiotes (Rating 1-3)	Soft	12	Rating x 5,000¥
Nanotattoos (Rating 1-3)	Hard	8	Rating x 250¥ (per area)
Neural amplifiers			
Learning Stimulus (Rating 1-3)	Soft	8	Rating x 4,000¥
Limbic (Rating 1-3)	Soft	10	Rating x 5,000¥
Neocortical (Rating 1-3)	Soft	10	Rating x 5,000¥
Recall (Rating 1-3)	Soft	6	Rating x 2,500¥
O-Cells (Rating 1-9)	Soft	8	Rating x 2,500¥
Oxyrush (Rating 1-5)	Hard/Soft	8	Rating x 1,000¥
Taggants			
Markers	Soft/Hard	8	Rating x 500¥
RFID Markers	Hard	8	Rating x 750¥
Trauma Control System (Rating 1-6)	Hard	8	Rating x 2,000¥

Nanocybernetics Bodyware	Essence	Capacity	Availability	Cost
Dynamic Handprints	0.2	—	12F	Rating x 1,000¥
Flashback System	0.3	—	8	5,000¥
Nano-Biomonitor	0.3	—	8	10,000¥
Nanohive (Rating 1-6)	0.5 + (Rating x 0.25)	[2]	Rating x 5	Rating x 10,000¥
Retinal Adjusters	0.2	—	16F	Rating x 5,000¥
Smart Skin (Rating 1-3)	0.5 x Rating	—	(Rating x5)	Rating x 10,000¥
Voice Mimic	0.2	—	16F	Rating x 3,000¥

Nanotech	Type	Availability	Cost
Altskin (per application)	Soft/Hard	12	1,500¥
Armor		+4R	+500¥
Newprint		+4F	+(Rating x 200¥)
Scaler		—	+250¥
Shade		—	+200¥
Shifter		+4	+300¥
Demolishers (per application)	Hard	8R	5,000¥
Smart Demolishers	Hard	12R	10,000¥
Etchers	Hard	8	500¥
Monowire (per meter)	Hard	16	1,000¥
Nanoscanner	—	8R	Rating x 2,500¥
NanoSpy (per application)	Hard	8R	7,000¥
Savior Medkit	Soft/Hard	6	2,000¥
Savior Medkit Supplies	—	6	500¥
Smart Corrosives (per application)	Soft/Hard	as corrosive + 4	as corrosive + 5,000¥
Universal Sealant (1 dose)	Hard	10	250¥



Nanofax Products	Availability	Cost
Nanofax (Plastic/Fabric Fabrication Only)	12R	500,000¥
Nanofax (Electronic/Mechanical Fabrication)	16R	2,500,000¥
Nanofax Upkeep and Licenses (per year)	8R	50,000¥
Evo Worldwear Subscription (per year)*	--	35,000¥
Typical Licensed Item	--	5,000¥
Complex Licensed Item	--	10,000¥

*Similar subscriptions exist for all aspects of personal fashion, including scents, jewelry, and accessories.

Weaponized Nanotech	Type	Availability	Cost
Cutters (per dose)	Hard	12F	8,000¥
Intruders (per dose, Rating 1–6)			
Activators	Hard	8R	Rating x 500¥
Broken Arrows	Hard	10F	Rating x 500¥
Deactivators	Hard	10F	Rating x 500¥
Fuzz	Hard	12F	Rating x 1,000¥
Gremlins	Hard	16F	Rating x 1,500¥
Nanoinfectors (Rating 1–6)	Hard	+8R	+(Rating x 1,000¥)
Shrikes (per dose)	Hard	16F	10,000¥
Surtrr (per dose)	Hard	20F	20,000¥

MEDICAL PROVIDERS

Providers	Typical Skills	Availability/Interval	Basic Care	Intensive Care	Services
Traditional Healer	2–4	4/12 hours	100¥ (Outpatient)	NA	a, sometimes k, l
Local General Practitioner	3–4	4/12 hours	100¥ (Outpatient)	NA	a, b
Street Clinic	2–4	4/12 hours	100¥ (Outpatient)	NA	a, b
Public Hospital	2–4	6/12 hours	250¥	500¥	a, b, c, d, e, f, i
Bodyshop	2–5	4/12 hours	250¥	1,000¥	a, b, e
Private Hospital	4–6	8/1 day	500¥	1,000¥	a, b, c, d, e, f, i
Street Doc	1–6	6/12 hours	500¥	1,000¥	a, b, c, d, e
Corporate Hospital	4–7	16/1 day	1,000¥	1,000¥	a, b, c, d, e, f, g, i, j, k, l
Elite Clinics	5–6	16/2 days	1,000¥	2,000¥	a, b, c, d, e, f, g, k, l
Elite Shadow Clinics	6	20/1 day	2,000¥	4,000¥	a, b, c, d, e, f, g, k, l
Delta Clinics	6–7	24/1 week	5,000¥	10,000¥	a, b, c, d, e, f, g, h, k, l

Service Guide

(a) General medical care.
 (b) Basic hospitalization.
 (c) Intensive care.
 (d) Surgery and major trauma.
 (e) Implantation (basic and alpha-grade cyberware/bioware).
 (f) Implantation (beta-grade cyberware/bioware, cultured bioware, basic gene therapies, nanoware);
 (g) Implantation (nanocybernetics, all genetech).
 (h) Implantation (deltaware, experimental genetech and nanoware).
 (i) Ambulance/emergency services.
 (j) Armed emergency response.
 (k) Magical healing.
 (l) Long-term magical care.

MEDTECH GEAR

Equipment	Cost	Maximum Patients
Medical Station	70¥/Rating	2
Medical Shop	10,000¥	4
Mobile Medical Shop	15,000¥	2
Medical Facility	200,000¥	8
Mobile Medical Facility	300,000¥	4

Biotech Gear	Availability	Cost
Biomonitor	—	300¥
Disposable Syringe	4	10¥
Medkit (Rating 1–6)	—	Rating x 100¥
Medkit Supplies	—	50¥



DocWagon Contract	Availability	Cost
Basic	—	5,000¥ per year
Gold	—	25,000¥ per year
Platinum	—	50,000¥ per year
Super-Platinum	—	100,000¥ per year

Slap Patches	Availability	Cost
Antidote Patch (Rating 1–6)	Rating	Rating x 50¥
Stimulant Patch (Rating 1–6)	Rating x 2	Rating x 25¥
Tranq Patch (Rating 1–10)	Rating x 2	Rating x 20¥
Trauma Patch	2	500¥

Pharmaceuticals	Availability	Cost	Biomed	Availability	Cost
Inoculation (Rating 1–6)	—	Rating x 50¥	AEXD	8	500¥
Antivirals (Rating 1–6)	—	Rating x 20¥	Antibac	7	600¥
Antibiotics (Rating 1–6)	—	Rating x 10¥	Binder	8 (14)	750¥
Antiparasitics (Rating 1–6)	—	Rating x 25¥	Zeta-Interferon	9	800¥

Body Part	Cost (Type O)	Cost (Cultured)	Growth Time
Eye	4,000¥	4,000¥	2 Weeks
Organ	6,000¥	9,000¥	3 Weeks
Hand/Foot	8,000¥	8,000¥	3 Weeks
Full Limb	21,000¥	25,000¥	4 Weeks
Skin/Hair	300¥	500¥	4 hours
Spinal Cord (Research Only)	Not available	70,000¥	6 Weeks
Full Body	25,000¥	40,000¥	8 Weeks

SURGERY TESTS

Procedure	Extended Test	Surgery Damage
Cosmetic/Biosculpting		
Minor	Medicine (Cosmetic Surgery) + Logic (4, 1 hour)	3P
Moderate	Medicine (Cosmetic Surgery) + Logic (8, 1 hour)	5P
Severe	Medicine (Cosmetic Surgery) + Logic (16, 1 hour)	7P
Gene Therapy	Medicine (Genetics) + Logic (6, 1 day)	3P
Implant Repair	Cybertechnology + Logic (variable, 1 hour)	As implant surgery
Implant Surgery (Cyberware/Bioware)		
Basic Grade	Medicine (Implant Surgery) + Logic (4, 1 hour)	*
Basic Grade (Cultured Bioware)	Medicine (Implant Surgery) + Logic (8, 1 hour)	*
Second-Hand	Medicine (Implant Surgery) + Logic (6, 1 hour)	*
Alphaware	Medicine (Implant Surgery) + Logic (8, 1 hour)	*
Betaware	Medicine (Implant Surgery) + Logic (12, 1 hour)	*
Deltaware	Medicine (Implant Surgery) + Logic (20, 1 hour)	*
Symbiont	Medicine (Implant Surgery) + Logic (4, 1 hour)	3S
Nanoware Installation	Cybertechnology (Nanoware) + Logic (6, 1 day)	3S
Organ Transplant/Replacement	Medicine (Trauma Surgery) + Logic (4, 1 hour)	5P
Trauma Surgery	Medicine (Trauma Surgery) + Logic (variable, 1 hour)	—

* See the Implant Surgery Damage table

IMPLANT SURGERY DAMAGE

Bio-/Cyberware Implant Essence Cost*	Severity	Damage Value
Less than or equal to 0.2	Superficial	3S
0.21–0.5	Minor	3P
0.51–1	Moderate	5P
1+	Major	7P

* Cybersuites must be installed in their integrity; use the total Essence cost of the suite to calculate surgery damage.

