

THE MATRIX

VIRTUAL REALITY—A PRIMER

“The problem with reality, is that it sucks.”

— Dianne Kaleb Blythe, pioneering icon sculptor

Dr. Killea Garrity

INTRODUCTION

In the late part of the last century, development of computer power capable of generating visual and auditory images that closely approximated reality in complexity of display and motion led to the coinage of the phrase “virtual reality”. At the time, such forays into perceptive “worlds” were based on external apparatus that could generate believable fields of information for visual and auditory interaction. Since human perceptive function is prone towards completeness of stimulus, the anomalies inherent in such an interface were not inhibitive. Visual fields were created using goggles or, in later years, cusps that could display enough information for peripheral and foveal stimuli to allow complex stimulus/response exchanges. Similarly, it was a relatively simple matter to generate auditory stimuli with sufficient detail and accuracy.

With the advent of neural inductive technology, the next step in the evolution of complete perceptive simulation took place. Rather than providing stimulus to the perceptive organs themselves, it was now possible to simulate the feedback from these organs at a neural level. The perception of stimulus no longer required the presence of external stimuli. Inductors implanted on the optic, olfactory, auditory, glosso-pharyngeal, and trifacial nerves as well as the spinal cord could simulate 94% of normal human perceptive function. This technological revolution shifted the limiting factor from stimulative mechanism to input field production. Generating movement and tactile images of sufficient detail requires incredible computer power. A typical nerve space (total volume of information encompassed by a neural channel) contains a million pieces of information and requires refresh every 500th of a second. In the case of spinal stimuli, the space complexity quickly approaches several million variables. The total input space for human normal perceptive field simulation averages 5 million variables refreshed 500 times a second for a total data flow of about 2.5 gigabytes/second. Common terminology measures this in terms of pulses, the fiber optic instantaneous bandwidth of 1 thousand bytes, so a single second of human perceptive space takes up 2.5 megapulses. Since generation of each variable requires an average of 100,000 computer operations, a single second of stimulus space requires 250 trillion operations. Computers capable of this kind of processing were not widely available until the advent of inline molecular superconductors. Even then, the machines were incredibly expensive.

Most current high-grade systems require intrusive surgical modifications, or ‘wires’. The operation is mundane, but does require extensive manipulation in the cerebrum. For this reason, it is not considered simple. As mentioned above, a typical wire harness attaches to five of the major nerve bundles coming from the brain as well as the spinal cord. Current induction systems are quite small and can be virtually undetectable. The feed for the system usually exits at the base of the skull, but routing to the wrist is not uncommon. This does, however, require a booster in the shoulder area. Feeds can be anywhere, but

must attach to bone to provide sufficient stability for ‘jacking’. It is also possible to hide the feed just below the skin and use induction pads for contact, but this kind of jack will not work with most systems and cannot deliver the kind of response some applications require (typically computer and control systems).

Civilian systems often use much less responsive and intrusive systems for entertainment. Simulated stimulus systems (simstims) usually come with external inductors for the eyes, ears, nose, and spine. The units look like a complicated pair of headphones. The effect of the system is much less intense, but still very believable. Since these systems are typically 40% less effective than intrusive delivery mechanisms, they are not adequate for most high-end applications. They are, however, very popular in the consumer market.

Contrary to popular opinion, it is unnecessary to use a keyboard when operating through a neural harness. Once the user is “jacked in”, they can communicate with their system without any physical effort. In fact, since a wire must completely pirate any stimuli passing along its client nerve, stimulus from the body is blocked both ways. It would prove disastrous if a vehicle operator, or “rigger”, were to actually move her body while controlling her machine. The unguided motions would undoubtedly result in injury. For this reason, a person working with a wire is unaware of stimulus from their body and cannot control it in any way. Usually, wire control systems monitor stimuli for neural flags and then pass similar stimuli along to the user for action. Such things as excessive pain, or maintenance signals are mimicked in the current virtual reality so that the user knows they are in pain or need to visit the restroom. Disconnection from the system is a simple matter of will without a physical manifestation. “Jacking out”, portrayed in so many vids as a violent unplugging of the wire jack, is in fact a completely mental process.

»»»So would it be possible for ice to block the ‘jacking out’ signal, or intercept it and let deckers think they jacked out?«««

— Micromara (14:20:49/05-31-52)

»»»Yes to both. It is possible to take control of the simsense of a deck externally and generate alternate feedback. It would take serious computer power, some really artful programming and the right context, but it is possible. You would think you fought off that ice. You would think you were safe. You would think anything it wanted. Until they came and got you.«««

— Guru (08:45:23/6-2-52)

CYBERDECKS

Confusion between simstims and virtual reality units are common. Simstim playback units are exactly that, players. They are in no way capable of true interaction. Consequently, they do not constitute a true virtual reality. The user is an observer only. As mentioned above, robust perceptive space virtual reality requires in excess of 200 trillion operations per second. Only the more expensive civilian units can deliver this kind of performance. In addition, these units require special hardware and software designs completely different from what one will find in the normal computer. Finally, all of these units assume the user is ‘wired’ and consequently they appeal to only a

small segment of the market. Thus, though there are probably 200 companies that produce computing engines in North America, there are only five that make these "cyberdecks", though one can modify an existing computing engine with available (if expensive) parts.

The level of virtual complexity these cyberdecks allow varies. The Tandy (Radio Shack) and Amiga (CBM/Target) machines are aimed at the low end of the market and though they are by far the most popular models, they also deliver a significantly curtailed reality. Sounds are muted, visuals less detailed, motion sloppy, and reaction sometimes sluggish. They are also prone to malfunction and breakdown. They are true virtual reality machines, but it is obvious to anyone using them that they are in a simulation. The top of the line models from Fuchi, Fairlight, and Interface are capable of stimulus impossible to differentiate from reality. These units carry, however, commensurately high price tags.

»»»What Guru neglects to mention in both places is that the program doing the simulating would have to know what your pad looked like to simulate it. Remember that a wire does not constitute a conduit to your thoughts, only a stimulus/response channel. Thus, in the situation Guru suggests above, there is no way the ICE (or whatever) could simulate your apartment/house/drainage ditch unless someone fed in the details.»»»

— Thor (09:54:5/6-24-52)

THE MATRIX

Current urban mythology (aided by the popular media) paints a romantic, but inaccurate picture of the current global data network, commonly referred to as the 'Matrix'. The matrix is not one huge network, but a collection of networks, each of which has its own peculiarities as well as a distinct flavor. Though the UMS imparts a degree of standardization to the sensory space, it is by no means universally accepted or implemented. In many cases, older systems are not capable of the necessary stimulus sophistication and thus implement simpler realities. In some cases, the UMS has been almost completely ignored in favor of aesthetic expression. Such 'sculpted' systems are expensive, but exist in sufficient quantities to warrant mention. It is interesting to note that such systems cannot be displayed on some of the more common decks available (i.e. the low end Tandy and Amiga offerings) because the systems cannot process the necessary information spaces. When accessed by such a deck, the stimulus is downsampled (damped) to allow interaction. Though this does not usually result in functional limitations, it can limit the user if the designers do not take such damping into consideration. The upshot of this varied representation is that the matrix appears not as a single reality, but as many realities joined by a variably consistent transport metaphor. Communications grids in most parts of the world are UMS compliant, but there are many exceptions.

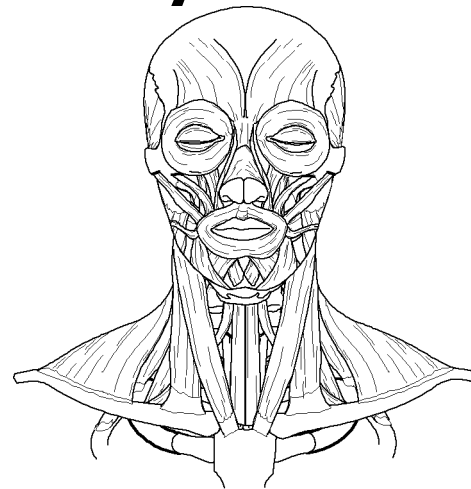
Another common set of myths surrounds the degree to which experiences in the matrix can have physical ramifications. The burning deck meltdown so popular in corporate sponsored propaganda stims and vids is simply not possible. The connections prevalent throughout the process are not capable of carrying those kind of voltages. This does not, however, render the concept of interface induced damage unreal. It is simply much less obvious to the casual observer. The human nervous system is a fragile and sensitive electro-chemical system which, when hooked directly into a stimulus space, becomes incredibly vulnerable. Because the nature of the stimulus space is so

complex, filtering that space requires huge amounts of processing power. System designers, trying to achieve the best interface for the least money, use only the most rudimentary safeguards; voltage and volume monitors that are relatively 'stupid.' For most users, this is not a significant drawback as the stimuli commonly available is far below that required to cause significant damage. After all, who would use the system if neural damage was a commonplace occurrence?

However, illegal use of interface equipment can result in physical damage to the nervous system. Simstim units are often modified to allow the use of excessively high levels of stimulus. So called 'Better than life' or BTL systems are a mainstay of the black market. Repeated use of such systems results in a variety of neurological dysfunctions, some of which are fatal. Similarly, cyberdeck interfaces are capable of carrying damaging and even lethal signal levels to the nervous system of their users. The generation of such signals is illegal, but if the recipient is involved in an illegal access, the situation is not black and white. Court cases involving such instances have established the 'home defense' precedent now recognized by most courts. A SAN is sufficient notice to any user that the territory they are experiencing 'belongs' to someone and that their unwanted presence within that territory constitutes trespassing. In addition, bypassing safeguards to enter a system is now legally classified as breaking and entering. From this standpoint, the use of so called 'black' intrusion countermeasures (IC's or Ice) is analogous to any weapon used to defend one's property.

It is possible to install filters which can recognize such stimuli and counter them. The hardware for this would have to be roughly twice as fast as an unfiltered deck. This kind of speed upgrade usually carries with it a tenfold price increase. To build such a system with the throughput of say a Fairlight Excalibur would cost in excess of 50 million nuyen. In addition, the advantages of such a system are questionable since illegal system access requires negation of protective ice in addition to survival and extended combat usually results in disconnection or 'dumping'.

Feed your head



Virtual Candy
LTG: 287 (45-6788)

THE ICE BOX

INTRUSION COUNTERMEASURES

Chris Beauregard <cpbeaure@undergrad.math.waterloo.edu>

»»»I originally posted a rather extended version of this to the CyberRPG mailing list. This was before I got a hold of VR and realized that a lot of what I had posted was covered in VR. So I changed this a fair bit...»»»

— Barron (08:14:30/05-11-92)

»»»Here are two new bits of ice to look out for. They keep on trying to stop us from grabbing their data. Heh.»»»

— Micromara (09:14:27/05-12-52)

PURGE IC

This white IC is similar to scramble, but it will instead erase the entire file. This IC was introduced because in the past, deckers have been able to download and analyze the scramble code and reverse the process.

Purge IC takes two actions to erase a file, and if it's stopped during the first action (slowed, destroyed, etc) the file could conceivably be recovered, with the help of certain *expensive* utilities or maybe a real good NPC decker.

Load Rating: 1/2 Rating (round down)

DEMOLISHER IC

This is another white IC based on scramble. It is placed in a datastore and covers all the files in the node. When any of the files is read by unauthorized individuals, it scrambles the entire contents of the node. If any files are downloaded with the IC still in place, it works similarly to scramble, except that if the IC is set off while within the deck, the IC, well, let's just say it thinks of the deck as one big node, and all those files within that node.... It starts with the largest file and works its way down. To destroy a file, roll the IC's Rating with a target number equal to the MPCP Rating of the deck. A success indicates that the file or program was scrambled. This is done with each file, stopping only when the program fails a test. It goes without saying that utilities hit cannot be run. It's possible to use a rebuild utility on stuff hit by demolisher (unless, of course, your rebuild was scrambled). Demolisher has a construct similar to scramble (a light coating of something) except that it covers the entire node.

Load Rating: Rating x 1.5

FREEFORM IC

Chris Beauregard <cpbeaure@undergrad.math.waterloo.edu>

File 2100-67-B

Dated 9 Jun 2050

Protected-C

Summary of Contract 2100-4-A

"Intrusion Countermeasure Verification of Mi-Tech Security Systems Incorporated FF-IC Freeform"

»»»Right from the databases of Denver Security Consulting Inc., a high profile "tiger-team" in New York. Seems they got contracted by Mi-Tech Security Systems Inc. to run some new IC through the penetration test. This looks to be a summary of the operation.

We're still looking for the full document, but I expect Mi-Tech has the only copy around. Good luck getting through their IC. Sorry, couldn't get the figures or the appendices with this stuff. They're probably with the main documents as well. As you can see from the comments, I've been playing with this stuff a little. There's a small base just off the Seattle grid with a test batch

of this stuff, and they don't keep good watch. The freeform there is also very, very lightweight stuff. Another lesson for the corps. If yer gonna put in the latest and greatest security systems, make it heavy. Otherwise, yer just helpin' the opposition. Oh, yeah. That comment 'bout Nasan Helles ain't a joke, either. Seems they contracted our buddy for a large chunk of this baby.»»»

— Barron

INITIAL TESTING

Simulation system was formatted after standard insurance company and small holding bank systems, the presumed client for this form of countermeasures. See Appendix A for full system plans. The FF-IC Freeform was placed in the SAN to the internal layer, and both CPUs. A lighter version was placed in the inner layer DLJ between the central CPU and the file storage area.

»»»That's a layered system for you slow types...»»»

— Barron

The first testing consisted of a selection of program frames attacking the FF-IC in the SAN. The program frames consisted of light attack utilities and variable analysis utilities. The FF-IC attacked the frames when in range and used the Nasan Helles patented engulfing attack to destroy the frames. Appendix B contains statistics on frame strength, FF-IC strength, and engagement times for all tests.

»»»Freeform IC seems to be an adaptive IC. It has no defined matrix construct. Normally, it appears as an energized mist until it has a target. Then it transforms into whatever it thinks can do the job and nails the target to the wall. The engulfing technique mentioned is what it uses against slow and stupid targets. Doesn't even bother transforming, just wraps around the target and nukes it.»»»

— Barron

The second initial test consisted of more intelligent and less straightforward attacks, still using the frames. The FF-IC invariably adapted to the best icon form and destroyed the penetrating frames. The only exceptions occurred when the frames used high masking and evasion levels. Very high levels tended to increase the node load to such a point that the FF-IC could not take the most efficient form. On several instances, the program frame managed to cause significant damage to the FF-IC. Another possibility is that high masking decreased the information available to the FF-IC such that it could not take on a form sufficient to damage the frame.

»»»The transform process eats power bigtime. Takes a little while to do. Once it makes it though, she's like a three-year old with wired 'flexes and too much sugar. Fast. Those high levels of masking and evasion, by the way, are probably well into the milspec levels. Not just boosted reaction here, chummers.»»»

— Barron

ADVANCED TESTING

The first of the advanced tests consisted of a simulated life form. Full analysis hardware was connected through a bio-chip with a simulated low-intelligence. The anti-personnel version of the FF-IC was used for this test. The intelligence was programmed for straightforward attacks on the target IC. As can be seen from Appendix D, the simulated intelligence performed extremely poorly against the FF-IC. Analysis indicates that the FF-IC exploited its adaptive features to bypass all the deck protective measures and deliver the anti-personnel capacity directly

to the intelligence. This feature was not seen in preliminary testing, and is likely specific to the anti-personnel versions of the FF-IC. Analysis of the attack method indicates a slightly improved version of standard anti-personnel algorithms. Also noted was the effects of the engulfing attack. Exiting the matrix when subjected to this form of attack increased significantly in difficulty.

The second test consisted of a live intelligence. In each case, a trained monkey was used in a variety of attacks on the FF-IC and its node. Again, high masking and evasion levels seemed to cause trouble for the FF-IC. The high quality anti-personnel algorithm was responsible for a much higher body count than usual, and more than offset these rare occurrences. Final testing consisted of a number of human intelligences. because of the limited number available, testing was not as thorough as in other areas. However, as can be seen by Appendix F, the FF-IC was more than capable of handling penetrations to all areas of the sample system. Analysis indicates that the FF-IC offered a very high psychological impact on targets, decreasing their resistance to its unique attack forms.

»»»This form of testing was basically suckering wannabees into takin' a run at their sample base. Figures that it took out so many. On the other hand, it seems a few real hot cowboys got pegged by this stuff too. We're still lookin' for names, but it could be bad news.»»»

— Barron

ANALYSIS

High adaptivity of the FF-IC resulted in much faster and higher kill rates. The engulfing attack especially increased the exposure to the attack mechanisms of the FF-IC.

High load required in transformations is a definite hindrance in its effectiveness.

RECOMMENDATIONS

Possibly decrease the size of the construct in order to increase transformation speed and decrease load. The high effectiveness of the FF-IC should more than offset any loss in strength from these changes.

»»»Other notes. They have all kinds of versions of freeform IC ready for the market. The Black versions are especially nasty, but there're versions with blaster, killer, and some weird psychological attack forms. Except for a pretty high load, these things have similar capabilities as yer standard gray/black IC. The effects of the transformation are pretty ugly though. Any attack you make against it, it's pretty much immune to a second shot. You can't slow this stuff at all, and I doubt seriously that you can plant a virus on it. If you try, make sure it's real adaptive. The other problem is that every attack it gets in on you, the one after it hits harder. Changing your defenses on the run seems to screw it up for a bit.»»»

— Barron

GM NOTES

Load Rating is double rating when transforming, rating otherwise.

It takes one action to transform to optimum shape. Target must be in observation range. If optimum configuration is reached, the IC has a negative modifier (bonus) on its attack target number. To reach optimum, roll the IC rating against the average of the target's evasion and masking levels. The IC gets -1 on the attack for each success scored. Freeform IC must transform to attack, even if it gets no successes.

Treat Freeform IC as having shifting defensive form with no increased load rating.

Trying to jack out when attacked by freeform-black IC requires an unresisted willpower test against twice the IC rating.

Each hit by Freeform IC on a target decreases the target of the next attack by 1. This is cumulative.

Any changes in the masking or evasion rating of the target requires a new transformation by the IC. All target numbers for attacks are reset.

Slow utilities have no effect on freeform IC.

Davison Hack is running the Mi-Tech system. He pops into a node with freeform-killer-5. The IC is in probe mode, and Davison blows his rolls. The battle begins. The IC wins initiative and gets the first action. It transforms. Davison's average evasion and masking is 5. The IC rolls 5 dice with a target of 5, and gets 3 successes. This could be bad. Davison gets the next action. He slams the IC with an attack-4, and hits for light damage.

The IC hits Davison next. It's got a -3 on the target number. It hits for moderate damage. Davison tries a slow-5. Bummer. The IC attacks again. This time, it's got a -4 (-3 from the transform, and -1 from the last hit). Davison lucks out, and takes light damage. Next time though, the IC is hitting at -5.

Next round, Davison gets first action, takes the hint and puts on a cloak-6.

The IC transforms again. This time, Davison's masking and evasion average is at 7. The IC manages one success, enough for a -1 modifier. Davison, in a burst of intelligence, skips out before the FF's buddies show up.

PROGRAMS

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»»»Here are some nice little utilities to help you out. I got mine from a friend in Seattle. Check the bulletin boards for purveyors if you're interested, but look out for narcs.»»»

— Micromara (09:17:02/05-12-52)

M-2097 MINE DETECTOR

Scooped from an obscure military database by an anonymous decker, this one will be a sure friend to the discriminating (and cautious) This is a heavily modified browse used to detect files or programs that the you really doesn't want to look at. Examples of these would be ones which cause systems alerts, activate IC, attempt traces, infect your deck with a virus, and so on. The target number is up to the GM, and depends on the sophistication of the trap (take a modern virus, for instance. It can range from the really obvious, to self-encrypting and mutating.)

Most versions of this program appear as a crew of military engineers who scrutinize every file with what you'll recognize as mine detection methods. Low rating programs involve some guy crawling around poking a knife into the node in a pattern around him, while more advanced versions consist of a couple guys with a shovel and metal detection rig. (We've also seen a hacked rating 1 version where some merc, fingers in ears and eyes shut, stomps ahead with one foot. A detection is real cute.)

Options: One-Shot, Link

Rating: 1 through 10

Size: Rating²

Price: by size and rating

Designer: UCAS Military

REBUILD

Something hacked together by the Ice Bunny after having one of those days. This program can be used to rebuild a scrambled file. The program is large, slow, and unpredictable. Fortunately, the good decker shouldn't need it much, and the bad decker, well, he isn't reading this. That's why most of you'll want the one-shot version (aside from the size of the thing, that is) We understand that the Bunny is working on something to take care of purged files, based on this thing.

When the program is running, roll the rating of the utility, with a target number equal to twice the rating of the scramble IC that hit the file. At least one success is necessary to even pull out usable data. Increased successes increase the amount of usable stuff that can be extracted (normally starts at about 50-75%). As well, the program requires a number of rounds equal to the rating of the scramble. The success test is made on the last round.

This program manifests as a bunch of cyber-gnomes who surround the file in question, tear it into tiny bits, and start sorting it into bits before rebuilding it. The whole process is reminiscent of a couple hyperactive kids putting together a puzzle.

Options: One-Shot

Rating: 1 through 10

Size: Rating² x 4

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The following material has been inspired by the game scenarios played out in the Greater Lafayette, Indiana region by a number of Shadowrun players. All material should be considered as entertainment value and game session inspiration. I do hope you enjoy it.

»»»Hey Hey, the Boss is away!!! So I just thought I would put forth a wee little thing that I got and very few others do. I do hope you enjoy this one...»»»

— Backdraft (11:50:30/7-23-61)

SMOKESCREEN I

With this program, it becomes a bit more possible to defeat smoke and related styles of programs within simsensual reality (i.e. the Matrix). The rating of the smokescreen I is pitted against the rating of the smoke program. For every two (2) successes the smokescreen I has against the smoke, the level of "interference" generated by the smoke is reduced by one (1) for the user of the program only.

Size: Rating² x 2

SMOKESCREEN II

This program is essentially the same as the smokescreen I above, but this version reduces the effect of smoke by one for each success, rather than every two.

Size: Rating² x 3

SMOKE FILTER I

This is a very powerful version of the smokescreen programs as listed above. It can be viewed as a limited version attack program, as it does technically attack smoke programs and their effects. However it is an all or nothing approach. The rating of SFI is pitted against the smoke programs effect. If the SFI gets even one (1) more success than the smoke program, then the smoke program is completely shut down/erased from the effect of the node. If the smoke program gets even one (1) success over the SFI, then the SFI has completely failed, and the smoke program continues functioning normally under its current parameters.

Size: Rating² x 4

COMPRESSOR IV

This version of the compressor utilities program functions at a greatly increased efficiency. Basically, it can compress a file four times greater size than the standard compressor utility program. Please note it takes a compressor IV to uncompress something of this size, and the compressor IV can uncompress files from the standard compressor utility program.

Size: Rating² x 5

SATELLITE SEARCH PROGRAMS

This program essentially aids the users of satellite uplinks and related devices search for positive connections faster. The rating of the program is added to the dice test for the search time. Please note, that the legality of such programs is such that many corpers who catch offenders using such will often kill the owner/user/possessor without provocation.

Size: Rating² x 4

Price: MP x 250 Nuyen

THE ULCISCOR STRAIN

Paul Devisser <pdevisse@twilight.kwnet.on.ca>

»»»Hoi chummers, hate to be the bearer of bad news, but a bud of mine got herself toasted last week. It seems that something hunted her down and fried her deck. I thought it was a corp decker, but when I went after it, I found it wasn't a persona I was fighting, but rather a construct.

I neutralized the fragger, and picked it apart. Really fascinating stuff, but scary. The author is very egotistical, and there's traces of the guy's ID throughout the construct. This ain't IC, but rather is a smart-frame with movement abilities, sensors, a self-encryption and mutation ability, a masking program, defensive and attack capabilities, and a tracking program.

The tracking program is similar to the trace and report, but instead it acts like a bloodhound, leading the construct after the target.

Every decker leaves little footprints, no matter how good he or she truly is. These are code fragments that are left after the decker passes through a node. They are parts of the persona chips, whose code is partially placed within the node to facilitate ease of execution. The fragments are very minute, and it is next to impossible to find them, unless you know exactly where to look. Apparently, this program does. Taken singularly, they are meaningless, but enough of them allow you to begin to put together a 'picture' of who they belong to. This is similar to the techniques used by anti-viral programs of the last century. The chance for error is fairly high, about 35-45%, but even still, it makes one think about covering ones tracks.

The author was some deckhead who lived near Detroit, some old fragger. He called it the Ulciscor Strain, which is supposed to be some form of Latin, meaning revenge or something like that. I destroyed the source code, but I couldn't find the backups. I can only hope that the fire destroyed them.»»»

— Epilogue (22:42:49/12-04-52)

A viral construct much like a smart-frame, with the ability to move about in the matrix. It has attack (6), shield (4), capabilities. It also can lock-on to a matrix trail, and follow it until it encounters the cause of the trail.

The ability to track a target is not new. Trace-and-report programs and the variations do it all the time, but they have the original personas to work with. This virus is imprinted with a recording of the persona of the intended target. It uses this recording to search the matrix, looking for data trails that bear a similar imprint. This is currently beyond what most corporations are capable of producing,

and unless a corp gets wind of this, it will be a several years before this becomes more than an isolated incident.

After finding its target, it will then attack until it destroys the target, or is defeated. Before it engages, it will send a transmission which is encrypted, to a predesignated point. The message contains information concerning the constructs current location, and the fact that it has found its target. If it survives it sends another message, in the same manner, that it has succeeded, and returns to a predesignated point to await further instructions.

The virus locks on to the bod persona of the target if attacking a decker. Data has a bod of I. The target can resist by using the evasion persona. Again, data has an evasion of I.

If the virus follows the trail to a point where the decker left the matrix, the construct will mark the place, and will continue to search for a new trail. If the trail leads into a construct that the virus cannot follow, search around to try to find a new trail, and failing that will actually attempt to enter the construct to find the target. If it encounters resistance that it must fight, it will withdraw.

When the virus locks onto a trail, it begins sending updates back to its origin. The route by which these are relayed is complex and very difficult to trace. In addition, the encryption scheme is unbreakable without access to a mainframe.

FORGING TIME/DATE STAMPS

David Girardot <Girardot@dickinson.edu>

»»»(Okay ya lamerz. Who sez us old timers can't be K-rad kewl with the rest of yas. So here's an excerpt from the latest phrack, *not* available at yer favorite corp elec-bulletin, about how ya don't have ta follow da lame corp policy of dem stoopid time/date stamps. For some of yas dis'll be like Xmastime, you'll get dat warm feeling like we did back in '83 (that's, 1983) when we discovered sendmail.)«««

— Samurai Electricity

*** DCC Channel Open

*** Transmitting

*** ...1...2...3...4...5...6...7...8...9...0

*** Transmission complete. Transaction Logged (12:03:33/2—31-53)

*** Invalid Date Error

— Override —

*** Scan mode activated...

»»»...with our policy of providing you, the decker, with the very latest in personal privacy technology I have written this article to reveal once and for all how to escape the PhoneNet's tiresome time/date stamps.

First, some background. The time/date stamps go back to security issues before even the great Matrix virus that crippled the first network. Back then there was no real way to validate the identity and/or veracity of the electronic modes of communication. The first incarnation of the time/date stamps occurred with the use of the private/public key cryptographic methods. Eventually, though, it was clear that there needed to be some standard way of identifying users with a clear electronic signature that would be difficult to forge. Thus, when the first worldwide network was designed, the crude time/date stamps were hard-wired into its infrastructure.

Nowadays, when any bit of data enters the matrix it is time/date stamped by the Phone/Net infrastructure, and checked and re-checked with special self-correcting algorithms by each node the data passed through. Indeed, this process produces the Link from the decker's persona to his physical entry-point into the matrix (the selfsame Link that the trace family of IC is so fond of).

Now then, the conventional wisdom is that because these time/date stamps are so deeply entrenched into the basic operations of the matrix that it is simply impossible to defeat. This is what the corporations would like you to think. The fact is that hacking the stamps is simply difficult.

The weakness of the system is the redundancy checking that goes on after you enter a new node — that is, a "trace" must occur back to the original entry-point and a new "stamp" applied on top of the old one. However, as any decker knows, his "link" to his entry point is not a literal link but a virtual one ... in other words, it is a not a rigid sequence from origin to present point, but the data packets flowing through it take the fastest path dictated between the two points. In other words, if a decker has gone through Nodes A, B, C, and D to reach node E; his datapath will include these nodes plus any other nodes the data travels through at any given nanosecond. So, while our decker was at point C his link path might have read: A, B, C it could read A,B,C,N,P,Q,D when he travels to point D. The nodes N, P, and Q though not physically visited by the decker are visited by the datastream link from the decker to his origin point.

Confusing? Well it gets even more complicated. You see, the link path differentiate between "real" link nodes (the ones the decker's persona has actually traveled through) and "gateway" nodes (the ones the link datastream takes for efficiency's sake.) So in the original example the link path would really be something like A,B,C (N,P,Q), D.

Okay, getting around the time/date stamps used to be pretty easy. All you did was modify your relocate program to "piggy back" on the link-path and merrily send it through millions of "gateway" nodes. One of two things would happen: the link-path would get so long that it would actually be "broken" — in other words your post would never get the time/date stamp added because the link path was so long. The other thing that would happen, if you wrote a really good relocate, was that the link-path would come out as total garbage, or better yet, someone *else's* link path.

Unfortunately the corps instituted RFC 931, a security measure, that added a subroutine to the algorithm to limit the link-path length by number of gateway nodes. So you couldn't trash the path anymore by filling it with tons of garbage. That was until a friend of mine realized that the subroutine would always count gateway nodes of the same name as the same nodes. He developed a technique that would ping-pong the link-path between two or three nodes, back and forth, ad infinitum. This would really phuck the link path and made hacking the time-date stamps a real breeze. He also discovered that while the link-path was ping-ponging you could get it up to a good ten or twelve million teratocycles and that while this was going on, you could input any time/date stamp you pleased.

So that's how easy it is. But what's the catch? The catch is that you *need* a link path. Your link is what allows you to control your persona from your, deck chummer. If you really did ping-pong your path even a couple hundred thousand teratocycles you'd have a response slower than the slowest turtle, nearly an eighth of a second delay for each keypress. Nope, while you've phucked your linkpath to hack the time/date stamping you need to hack yourself a real linkpath so you can go merrily about your business.

The procedure is, again, a modified relocate program. There are two catches, however. One is that this program is about as degradable as it gets. Each combat round, yes round, it loses one point of rating ... *unless* the program is being hacked on the fly. Also, maintaining the link through multiple grids is difficult, so each grid change (for example LTG to RTG) requires one die per threshold of the grid (1 for blue, 2 for green, and so on). The rating of the link program must exceed

the security rating of the current node, and *each* node passed through. For instance, if you need to maintain a link through a red-5 node you need to have a link-6 running. The other bad news is that maintaining the link is rather hard on the deck and lowers the response rating by one. (Yes, that means you must have at least Response-1 to run the program.)

Example: BlackBeard has 23 dice in his hacking pool and a Fuchi-CYber-4 with Response +2. He is maintaining a link from his apartment in Seattle to a Shadowlands based in a corp computer in a different RTG. The inter-grid nodes are all green so there's six dice gone from the pool to maintain them. BlackBeard has passed through three nodes in the corp computer to the shadowlands in one of the datastores (the Orange-5 SAN, the Green-3 SPU, and the Red-3 CPU). He has to allocate another 12 dice from his pool for a link-6 capable of getting through the rating-5 of the SAN. 15 dice in all are allocated to the pool... bringing him down to a measly 8 dice... and don't forget his Response is only +1 while his deck runs the link.

Disengaging a link while in the matrix is tricky, because you have to re-connect to the "real" link-path you've been ping-ponging all over creation. Make a computer skill test against a target of the number of twice the minutes the link has been ping-ponging. You must get a number of successes equal to the threshold of the highest security rating of the nodes you've been through. (So in BlackBeard's case, if he'd been ping-ponging his link for 5 minutes while in the shadowlands he'd need to get at least 2 successes against a target number of 10). The base time for re-establishing a link is 1 minute, divided by the number of successes. Until the link is re-established, the decker has a reaction of 0 (and is allowed no modifiers) and always acts last in the round with his actions taking place at the end of the *next* round. This slowdown affects *all* actions, including jacking out.

Well, I told you the procedure wasn't easy. But at least you know it's possible. Down with IC! Free data for all! Sayonara.™™™™

— NightWind (Field To Large)

™™™™Yes, kiddies, if you gain control of a lamer's deck you *can* disconnect him from his link. A real nasty trick to play on your enemies!™™™™

— BlackBeard (Null)

™™™™Disconnecting another decker from his deck isn't easy. The first step involves hacking a "trace" construct and the second winning a resisted computer test against the enemy decker to force them to "ping—pong" their own link.™™™™

—David

SUPER OR POWERNODES

Jonathon K. Henry <warmongr@mentor.cc.purdue.edu>

™™™™The following is a little something that I discovered while doing some research for my boss, the Reflex while he's away down in Aztlanville. I hope a few of you enjoy this, as it makes "corp computers" that much more dangerous to encounter.™™™™

— Backdraft (10:21:44/1-3-61)

It has often been wondered why the "corporate decker" has such a major advantage to his operations. We at the Nevermore Foundation now think we may have the solution to this unusual dilemma. The introduction and usage of the "supernode".

A supernode, or powernode to some, utilizes a parallel tree setup with varying numbers of additional SPUs set aside for the purpose of regulating and controlling information and datastyle MP. For example, it is commonly known that an orange-5 node has a load rating (LR) restriction of 15. With the discovery/introduction of the SuperNode this is no longer the case. Say the orange-5

system is running with assistance from an SPU(I/O) supernode of rating 5. This causes a reduction of 16 to the effective LR of the node's functioning.

How does this work, why similar to the SPU(I/O) put forth in the street catalog known now as the *Shadowtech* sourcebook. The scale for the reduction as compared to the rating is as follows.

Level 1 = LR reduction 1
 Level 2 = LR reduction 2
 Level 3 = LR reduction 4
 Level 4 = LR reduction 8
 Level 5 = LR reduction 16
 Level 6 = LR reduction 24

It is thought that each level beyond six (6) causes an additional rating reduction of 8, not doubling the previous levels power.

What limits to this are there? To date we have discovered this: the system rating is apparently the maximum LR reduction level allowed. In the above example, the orange-5 system would be limited to a level 5 SPU(I/O) setup.

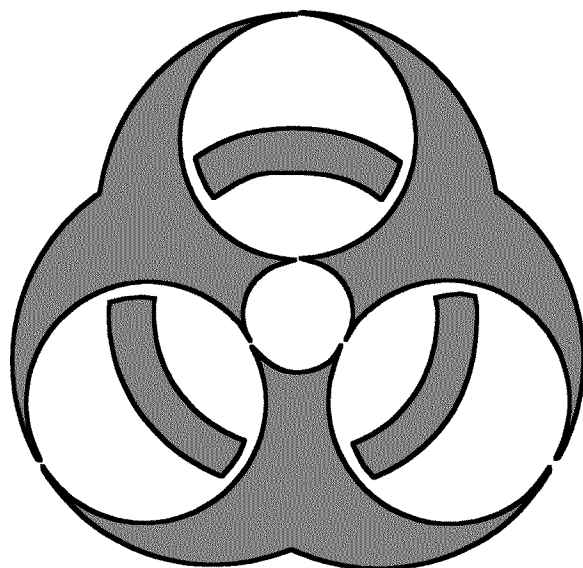
How come everyone in the node doesn't have this benefit then? Simple really; there is a parallel SPU that is not usually mapped out on a system chart. This SPU is connected to a series of passcode files that are used by the system. It is usually guarded by the toughest IC in the system. Unless the decker/user's icon contains this passcode/identifying signal, the system simply does not allow access to this extra processing power.

It is of note that a system with multi-layer security often has more than one SPU(I/O). Usually one per color/level of security. Sometimes the SPU(I/O) is connected only to certain nodes, and not to the entire system and its associated subsystems.

To date, the corps that are known to contain this kind of functioning are: Aztechnology, Renraku, HKB (Atlanta), Nemesis-Crysteck, Fuchi, and Mitsuhaman.

™™™™Have fun with the concept guys, I just hope the boss got this in time for his own uses...™™™™

— Backdraft (10:39:32/1-3-61)



No matter how hazardous, we are your cleaners.
 LTG: 647 (66-6666)

REFERENCE

THE WORD ON THE STREETS

A definitive listing of street slang in 2050

compiled by the Dark elf <VESPOSIT@ccvm.sunysb.edu>

- A-Boys:** A type of boostergang whose motif is a specific animal.
- Angel:** A benefactor, especially an unknown one.
- Arc:** An arcology.
- Ballerinas:** Reflex boosted female assassins in the employ of a major corp.
- Booster:** Gang member that uses cyberware, leathers, and violence as a way of life.
- Bounts:** Bounty hunters.
- Bopper:** A robot.
- Brain Tap:** A datajack or a chipjack.
- Breeder:** Orc slang for a "normal" human.
- Business:** In slang context, crime. Also "Biz."
- Buzz:** Go away. Buzz off.
- Chipped:** Enhanced by cyberware.
- CHOOH:** ("choo") Slang for alcohol, as used in vehicle power plants.
- Chromatic:** Heavy Metal music.
- Chromer:** Slang for metalheads, heavy metal fans.
- Chummer:** Pal or Buddy.
- Cinema:** A movie, usually in trid.
- Clavie:** Any person who lives in an enclave.
- Combat Drugs:** Designer drugs for military use.
- Comm:** The telephone.
- Corp:** Corporation, corporate.
- CORPSE:** CORPorate Security Expert, a corporate assassin.
- Cowboy:** A decker/netrunner.
- Dadlie:** Knowledge or skill chip.
- Dandelion Eater:** An elf, very insulting. See also *Keeb*.
- Dataslave:** a corporate decker or a data processing employee.
- Datasteal:** Theft of data from a computer, usually by decking.
- DEBS:** Transvestites, a type of poser gang.
- Deck:** 1. A cyberdeck. 2. To use a cyberdeck illegally.
- Decker:** A pirate cyberdeck user. Derived from 20th century "hacker."
- Deckhead:** A Simsense addict. Or anyone with a datajack/ chipjack.
- Derms:** see *Dorphs*.
- Dinks:** Any member of a rival boostergang.
- Dorphs:** Designer drugs that increase healing rate and limit fatigue. (also, *Derms*)
- Dr. Know:** A contact who always seems to have useful info. Also a seller of knowledge and skill chips.
- Drek:** Shit.
- Duck:** A person who carries more weapons than could possibly be needed.
- Dumped:** Involuntary ejection from the matrix.
- Enclave:** Corporate subsidized housing aka the projects.
- Exec:** Corporate executive.
- Fate Meat:** Someone bound for the body banks. "It is his fate to be meat"
- Fetishman:** A talismonger, a dealer in magical items.
- Flatlined:** killed in the matrix by Black IC.
- Flickercladding:** A synthetic plastic material impregnated with fiber optics and temperature gauges designed to respond to skin temperature, a 21st century version of the mood ring, but is worn as clothing.
- Frag:** a common swear word.
- Fringe, The:** Edges of society where nomads hang out, barrens.
- Geek:** To kill.
- Glitter Clothes:** Clothes made of *flickercladding*.
- Glitter Folk:** Rich people who only have time and money.
- Go-go-go:** A bike gang or gang member.
- Gothics:** A posergang whose motif is death and old b&w horror movies.
- Gutter Jumpers:** Claim jumpers among the homeless, squatters.
- Gyro:** A small one or two man helicopter.
- Hardwired:** 1. Having Cyberware. 2. Unable to change, inflexible options.
- Heatwave:** A police crackdown.
- Hitmage:** A magic-using assassin.
- Hoi:** Hi, Hello.
- Hose:** 1. Louse up, screw up. 2. to spray with an automatic weapon.
- Hydro:** 1. Hydrogen fuel. 2. anyone crazy enough to take it as a drug.
- ICE:** Security software. Intrusion Countermeasure Electronics.
- Input:** A girlfriend.
- Jacked-In:** Actively using a cyberdeck.
- Jam:** 1. To fight or to run away "let's jam". 2. *Jamming*.
- Jamming:** 1. Sex. 2. Moshing heavily in a band. 3. Being involved in a paramilitary operation involving a large amount of flying bullets and shrapnel.
- Jander:** To walk in a casual or arrogant manner, to strut.
- Keeb:** An elf, very insulting. See also *Dandelion Eater*. After a discontinued advertising campaign (Keebler).
- Knife Bullets:** Armor piercing ammunition.
- Know, The:** Knowledge or information.
- Kobun:** A Yakuza clan member.
- Meat Bop Parts:** Vat grown replacement body parts.
- Meat Puppet:** A prostitute whose memory and/or senses are disabled temporarily.
- Mnemonic:** Someone who uses a brain implant as an electronic vault.
- Motorhead:** A rigger or a mechanic.
- Mr. Johnson:** An anonymous corporate agent.
- Mundane:** A non-magician, or non-magical.
- Muscle Boy/Girl:** Someone with enhanced strength.
- NetNerd:** Someone who spends more time in the matrix than in the real world.
- Ninja:** A freelance assassin.
- Nutrisoy:** Cheap processed food product derived from soybeans, fortified with most essential vitamins.
- Nuyen:** World standard of currency. Used for Japanese foreign markets.
- Output:** A boyfriend.
- Oyabun:** Head of a Yakuza clan.
- Panzer:** A combat hovercraft/ ground effect vehicle.
- Paydata:** A datafile worth money on the Black Market.
- Plastic Gangster:** A person with a great deal of cyberware.
- Plex:** A metroplex, a large city.
- Poli:** A policlub or a policlub member.
- Polymer-one-shot:** A cheap hold-out pistol.
- Poser Gang:** Any gang whose members all adopt a specific look or style.
- Razor Boy/Girl:** A person who uses various bladed implant weapons.
- Ripperdoc:** A surgeon specializing in implanting illegal cyberware.
- Rocker Boy/Girl:** A freelance musician.
- Samurai:** A mercenary or muscle for hire. Implies an honor code.
- Sarariman:** A corporate employee.
- Screamer:** A credstick or passkey that triggers alarms when used.
- Seoul Man:** A member of a *Seoulpa Ring*.
- Seoulpa Ring:** A small criminal gang.
- Shadows:** The quasi-criminal world of freelance *shadowrunners*.
- Shalkujin:** An "honest" citizen.
- Sinless:** 1. Part of the underclass not having a SIN (c.f. *System Identification Number*). 2. In the *Shadows*.
- Slot:** 1. a mild curse. 2. To use a skillsoft.
- Slot and Run:** 1. Hurry Up, Get to the point. 2. Move and Run.
- So Ka:** I understand.
- Soykaf:** Coffee substitute made from soybeans.
- Squat:** see *Stuntie*.
- Stud/Studding:** Rigging or remote control of a vehicle.
- State of the Art:** 1. Hipper than Hip. 2. To be on the edge.
- Stuntie:** A dwarf, highly insulting. also *Squat*.
- Sprawl:** 1. A metroplex (c.f. *plex*). 2. To fraternize below one's social level.
- System Identification Number (SIN):** ID number assigned to every member of society. (but c.f. *sinless*)
- Tag:** Name, handle or trademark. To grab or take something.
- Tagged:** Equipped with a tracking device. Recognized.
- Trid:** Three-dimensional successor to video.
- Trog:** An Orc or a troll, very insulting.
- Very:** Hip term for cool fun or "in."
- Vatjob:** Someone who has extensive cyber/vat grown replacement parts.
- Wagemage:** A magician who works for a corp.
- Wavy:** Cool or smooth.
- Wetware:** 1. Biological enhancement. 2. Any original body organ.
- Network:** Assassination, murder.
- Wigly:** Weird or different. Usually referring to a good drug trip.
- Wire Boy/Girl:** A *decker*.
- Wired:** Equipped with cyberware, especially wired reflexes.
- Wiz:** 1. *Wizard*. 2. anything impressive. Truly *wiz*, man.
- Wizard:** 1. A powerful mage.
- Wizworm:** Slang for a Dragon.
- Word, The:** Any type of slang or gossip.
- Yak:** Yakuza. Either a clan member or a clan itself.

DEFINING POINTS IN WORLD HISTORY

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Reference Key

CS	Corporate Shadowfiles	SEA	Seattle Sourcebook	TT	Tir Tairngire Sourcebook
NA	Neo-Anarchist's Guide to North America	SRI	Shadowrun I rulebook	other	Other references
SB	Shadowbeat Sourcebook	SRII	Shadowrun II rulebook		
		ST	ShadowTech Sourcebook		

3454BC Jul 22	Crater Lake (Oregon, North America) formed.			TT 22
3114BC Aug 11	Believed start of Mayan Calendar.			other
1985	Genome Initiative begins.			ST 67
1996	Summer Olympics in Atlanta.			NA 38
1996	Wave of deregulation in USA.			NA 79
1998	By now, US defense establishment cut by 40%. Defense contracts dry up. Social services trimmed or eliminated. Unemployment reaches 50% in some regions.			NA 78
1998	Teamsters' New York local go on strike.			CS 17
1999	Hundreds killed in New York City food riots.			SRII 20
1999 Feb 21-22	Mobs attack Seretech vehicles.			CS 17
1999	Seretech Decision.			CS 17
2000 Jan 1	Quebec declared Independence from Canada.			NA 64
2001	Shiawase Decision establishes extraterritoriality to multinational corporations.			SRII 22, CS 18
2002-2008	The Resource Rush.			SRII 22
2003	Anglo-Japanese suborbital <i>Ghost</i> unveiled, breaking international travel speed records.			
2003	Panthers declared extinct by World Wildlife Protection Fund.			TT 21
2004	Libya attacks Israel with chemical weapons. Israel retaliates with nuclear weapons.			SRII 22
2004	Nuclear meltdown in Kent, Great Britain.			
2005 Aug 12	Major earthquake in New York City; United Nations moves to Geneva.			SRII 22, NA 119
2008	Ultra-fast digital packing algorithm allows HDTV			SB 20
2008	<i>Mir</i> space station destroyed.			CS 88
2008	Texas creates Urban Militia units with military weapons			NA 81
2009	Re-Education And Relocation Act passed.			NA 79
2009	Anti-Indian riots in California.			NA 13
2009 May 16	SAIM occupation of the United States Shiloh Launch Facility ends with the launch of Lone Eagle nuclear missile toward Russian Republic.			SRII 22
2009	Grey wolves declared extinct by World Wildlife Protection Fund.			TT 21
2010	VITAS plague breaks out in New Delhi, spreading worldwide, killing a significant proportion of the worlds population (25% by the end of the year).			SRII 23, SRI 13, NA 13
2010	United States government passes the Re-Education and Re-Location Act.			SRII 22
2011	Year of Chaos.			SRII 23
2011	Mexican government collapses.			SRII 23
2011	Emergence of Unexplained Genetic Expression (UGE)			SRII 23
2011	Nuclear meltdowns in Scotland and Britain.			
2011 Jan 13	Earthquake rocks Olympic Peninsula.			SEA 14
2011 Dec 24	Great dragon Ryumyo appears in Japan, signaling the start of the Mayan Sixth World.			SRII 23
2011 Dec 24	Ley lines activate in Great Britain.			
2011 Dec 24	Daniel Coleman Howling Coyote leads Native Americans out of Abilene Re-Education Center.			SRII 23
2013	Combat Biking appears.			SB 65
2014	Creation of the United Free Republic of Ireland.			SRII 24
2014	Howling Coyote announces claim to North America, claims responsibility for Redondo Peak eruption. U.S. Military beset by tornadoes.			SRII 23
2014	Formation of the NAN and STC.			SRII 24
2014	White control in South Africa dissolved.			SRII 24
2015	Hong Kong secedes from China.			
2015	Space Station <i>Freedom's</i> orbit begins to decay			CS 89
2015	Salish forces capture trident submarine base at Bangor; and Puget Sound Naval Shipyard at Bremerton.			SEA 14
2016	Space shuttle program degenerates.			CS 89
2016	Ares purchases and restores space station <i>Freedom</i> . Ares begins construction of <i>Apollo</i> .			CS 89
2016	U.S. ratifies the Resolution Act of 2016, sanctioning total extermination of Native American tribes.			SRII 24
2016 Dec 12	General Secretary Nikolai Chelenko (Russia), President Jesse Garrety (United States), Prime Minister Lena Rodale (Great Britain), and Minister Chiam Schon (Israel) assassinated.			SRII 24, NA 78
2017 Aug 17	Great Ghost Dance causes simultaneous eruptions in the Western U.S. at 10:32 am.			SRII 24
2017 Dec 11	Quebec invites Maritime provinces to join Republic.			NA 65
2018 Apr	Treaty of Denver signed. Acknowledgement of NAN sovereignty. Quebec abstained.			SRII 24
2018	Dr. Hosato Hikita of ESP Systems unveils ASIST technology.			SRII 25, NA 104
2018	U.S. Spaceplane <i>America</i> disintegrates in orbit, falling on Longreach, Australia.			SRII 25

2019	More than 200,000 refugees descend upon Seattle. Bellevue, Renton and Kent become part of Greater Seattle.	SEA 15
2019	Newfoundland is annexed by Maine.	NA 65
2019 Sep 6	Everett and Tacoma merge with Seattle.	SEA 16
2020	<i>Apollo</i> becomes Ares' principle space platform. <i>Freedom</i> becomes Zurich-Orbital.	CS 89
2020 Nov 16	Washington State dissolved; Seattle Metroplex officially recognised.	SEA 16
2021 Apr 30	Goblinization begins.	SRII 25, SEA 16
2021	Walter Bright Water becomes representative to Salish-Shidhe Council.	TT 26
2022	VITAS again spreads worldwide. Racial riots worldwide.	SRII 25
2022	Formation of independent Quebec, the Caribbean League and other nations.	SRII 25
2022	Construction starts on Aztechnology Complex, Seattle.	SEA 56
2022 Aug	Gov. of Seattle orders metahumans released.	SEA 16
2022	Public control over broadcasting crumbles.	SB 25
2022	Urban brawl appears.	SB 68
2023	Corporate Court installed at <i>Zurich-Orbital</i> .	CS 89
2023 Feb	Seattle Police Force goes on strike. SPD dismissed. Lone Star given security contract.	SEA 16
2024	Introduction of commercial simsense.	SRII 26
2024	Renraku's DigitalXScan holo protocol accepted.	SB 20
2025	UCLA offers first undergraduate program in occult sciences.	SRII 26
2026	First generation cyberterminals developed.	SRII 26
2027	First operational fusion reactor goes online.	SRII 26
2028	Magical Studies at University of Chicago begin.	NA 106
2029	Salish-Shidhe Council adopts tenet of welcoming metahumans. Sinsearach tribe formed.	TT 26
2029	Second generation cyberterminals	SRII 26
2029 Feb 8	Crash of '29 - Computer virus crashes worldwide computer network. Echo Mirage activated.	SRII 27, SEA 16
2029 Apr 9	Virus infects US Air-traffic control. Cripples air-travel for a week. Collapse of state-based culture.	NA 80
2029 Aug	Coordinated Echo Mirage attack on computer virus begins.	SRII 27
2030 Oct 15	United States dissolved. Union Day. Remains of USA merge with Canada, formation of UCAS.	NA 78,80
2030	Calls in California for secession.	NA 13
2030	Announcement of Walter Bright Water's death.	TT 26
2030	Construction completed of Aztechnology Complex, Seattle.	SEA 56
2030	Shoshone and Modoc tribes join Salish and Makah tribes. Oregon is left to metahumans.	TT 26
2030	Aithne Oakforest, Sean Laverty and Lugh Surehand. Lugh appear.	TT 27
2030-2042	EuroWars: Members of CIS breakaway. Awakened dominate Western Siberian Lowland, Yukat ASSR, and lands west of lowlands.	SRII 28
2031	Last remains of computer virus removed.	SRII 27
2031	Russian Republic steamrolls across Belorussia, and invades resource-rich Europe. UCAS forces recalled from NATO.	SRII 28, NA 81
2031	Salish-Shidhe's southern cities reoccupied.	TT 27
2032	Russian forces in Poland launch renewed attack on Berlin. Britain sends in troops to protect her interests.	SRII 28
2032	Southern US senators threaten to secede.	NA 30
2032 Mar 21	Concrete Dreams change course of music.	SB 7
2033	Awakened forces invade Brazil, creating Amazonia. Aztlan secedes from NAN.	SRII 28
2033 Jan 23	38 Nightwraith fighter-bombers attack both sides of the EuroWars, effectively ending it.	SRII 28
2033-2034	Portland Peace Force grows rapidly.	TT 103
2034	Zurich-Orbital Gemeinschaft Bank opens on ZO	CS 89
2034	Ten UCAS states secede to form the CAS.	SRII 28, NA 30, NA 80
2034 May	Matrix Systems releases first commercial cyberterminal.	SRII 28
2035	UCAS has no military presense outside North America.	NA 81
2035	Atlanta made capital of CAS. Aztlan begins military takeover of southern Texas.	NA 30
2035 Mar	Texas secedes from CAS and attacks Aztlan.	NA 15, NA 30
2035 May 1	Lugh Surehand announced formation of Tir Tairngire. Salish-Shidhe forces repelled.	TT 29, TT 103
2035 Jun 8	'Insurance War' in Atlanta	NA 38
2035 Jul	Texas rejoins CAS.	
2035 Aug	Three more Princes on Tir Tairngire council: Jonathon Reed, Maria Cinebal, Dar Varien.	TT 36
2036	Fuchi markets third-generation cyberterminal.	SRII 28
2036	Alamos 20,000 claims first New Terrorism act: firebombing of Ohio community.	SRII 29
2036	Portions of New Mexico and Oklahoma join the CAS.	NA 30
2036	Southern states of the UCAS threaten to secede, then did so 10 days after MacAlister's 'Eat My Shorts' speech.	NA 13
2036	Treaty of Richmond signed between UCAS and CAS.	NA 13,80,86
2036	Tir Tairngire mounts an armed incursion into California. Tir border extended to Yreka. Battle of Redding.	TT 30
2036	Tir Council acknowledges Portland is hub of trade. Construction starts on Portland wall.	TT 32

2036	Four more Tir Tairngire Princes named.	TT 38
2036 May 1	First Tir Tairngire Rite of Progression.	TT 62
203(677)	Tsishian secession.	SRII 29
2037	California Free State formed.	SRII 29, NA 13-14
2037	CFS mobilizes against Tir Tairngire's land claim down to Redding. Aztlan moves into San Diego.	NA 14-15
2037	Fuchi brings out RealSense system.	SB 75
2037	Portland Wall completed.	TT 32, TT 110
2037 Feb 7	Japanese forces arrived in San Francisco.	SRII 29, NA 15
2038	British government discovered to be involved in gene-manipulation on citizens.	
2039	Chemical spill in Teeside Industrial District in England kills 70,000.	
2039 Feb 7	Night of Rage.	SRII 29, NA 81
2039 Feb 10	IBM Towers in Chicago destroyed. Shattergraves created.	NA 105
2038	Hawaii secedes from UCAS and becomes a monarchy.	NA 80
2039	NAN imposes heavy trade sanctions on CAS to speed up metahuman equality.	NA 30
2040	Construction starts on Renraku Arcology, Seattle.	SEA 47
2040	CAS presidential elections. Joseph Alexander is elected president.	NA 30
2041	Brink of Corp War	CS 80
2041	EuroAir flight 329 downed by terrorist dragon Sirurg.	SRII 29
2041	Policlubs emerge in Europe.	SRII 29
2041	Exodus of Dwarves from Seattle Underground.	SEA 13
2041	Tir Tairngire passes Art Education Act.	TT 73
2043	Tir Tairngire 'Star Chamber' created.	TT 43
2043	Second Tir Tairngire Rite of Progression.	TT 62
2044	Aztlan nationalized all foreign-owned businesses. In confusion, Aztlan annexes most of Mexico.	SRII 29
2044	Concrete Dreams played last concert at Club Penumbra.	SB 7
2044	Olympic Games revived.	SB 63
2044	CAS elections: Alexander re-elected.	NA 30
2044	Aztlan annexes remainder of Mexico.	NA 30
2045	CAS President Alexander dies in office.	NA 30
2046	Policlubs emerge in North America.	SRII 29
2046	MegaMedia unveils Honey Brighton's simsense <i>Free Fall</i> .	SB 74
2046	By 2046 three Corps announce they have a complete genemap.	ST
2047	120,000 die in Tynesprawl, England from para-VITAS.	
2048	Aztlan and several megacorps sign Veracruz Settlement.	SRII 29
2048	CAS Elections: Edna Wallace elected President.	NA 31
2050	Development of 7th generation Cyberdeck (keyboard sized).	SRII 29
2050	Universal Brotherhood enjoys international growth.	SRII 29
2050	Third Tir Tairngire Rite of Progression.	TT 62
2050	Protests in Atlanta about metahuman rights.	NA 31
2051	Universal Brotherhood attempts to open in Salem.	TT 142
2052	Tir Tairngire negotiates with Seattle for use of ports. Large percentage of international trade shifted to Seattle.	TT 32
2054 Feb	Tir Tairngire information uploaded to Denver.	TT 8
2056	Planned Summer Olympics in Tokyo.	SB
2057	Planned 4th Tir Tairngire Rite of Progression.	TT 62

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