

Overclockers



I switched to Level 2. The threats and curses were still coming, but now as a pleasant baritone as my TSRware filled in details and corrected for noise. The arm that waved around threateningly looked more languid. I switched to Level 3. The room was still: the angry people were still there, but looked like colourful plastic sculptures. The fountains had turned to crystal ornaments, each ellipsoidal droplet hanging in the air like a slowly undulating glass bead. Most of the scenery was generated by my muse since I couldn't move my eyes fast enough to fill in details. I looked at the people and considered my options. Despite the speedup I did not have that much time – one was already reaching for some kind of weapon. I shifted fully into slowtime and begun to examine the weapon and its security interfaces. I sent some somatic commands to my body to start an apologetic shrug and start of an excuse – no point in giving the game away too early – and began to hack the software.

*How fleet is a glance of the mind!
Compared with the speed of its flight
The tempest itself lags behind,
And the swift-winged arrows of light.
- William Cowper*

Overclockers are transhumans obsessed with mental speed. While some are merely focused on efficiency, many see it as a good in itself - they want to break away from the sluggish matter and meat, and the faster they go, the more annoying the physical world becomes. In the end, they turn into exhumans.

Practically all overclockers are infomorphs. There is simply no way of building a morph that can keep up with the mental speed of a modern optical computer. There are those who control microbots and miniature morphs, but dedicated overclockers begin to notice the

problem with lags. Virtual environments are much better at keeping up with their demands - but even here communications lags tend to become annoying. Many overclockers find "realtime" mesh communication with the outside world tedious.

Normally infomorph speeds are limited by the speed of standard nanoproductors. These have not improved much since the Fall. In fact, given the fears of a TITAN resurgence, general nanoproductors have been deliberately limited and time-critical operations implemented using dedicated hardware. Certain "hot cores" allow faster processing - these are often pre-Fall relics or experimental designs, illegal under most anti-TITAN laws.

There are rumours among overclockers about fantastically rare and expensive QE processor clusters using qubits for instantaneous internal communication. While theoretically such clusters could be built, they would be *amazingly* expensive. Most design ideas involve super-fast nanoproductor grids built on top of a qubit factory delivering a torrent of precious qubits and dissipating enormous amounts of waste heat.

A sensory backwash of synaesthesia hits one splinterself – as I taste and touch and smell her unlocked datafiles – while another subpersonality frantically debugs a half-million lines of software code – comprising a homebrewed program designed to turboboost my cognitive clockspeed past mere human equivalent processing rate. No rush, really – because I may have as many as 30 to 35 leisurely seconds left to finish coding the accelerationware.
– Adam Warren, *Iron Man: Hypervelocity*

Another method of accelerating thought is to try to parallelise it further. Normal egos are already run as massively parallel processes across a myriad of individual processors and the necessary serial steps in updating the neural state and communicating it to the other processors limits them. The "maspar" overclockers hack the ego emulation algorithms to make them more parallel. The main trick is to tweak the mathematical operations to reduce precision but allow better parallelisation, or represent the neural states in more efficient mathematical forms such as Brauer groups, Iwasawa motifs or CZ-Fourier space. Other tricks include precomputing and caching common calculations, speculative execution (rather than wait for slowly arriving information from remote processors, all possibilities are locally calculated ahead of time and the incorrect ones discarded) and even nano-quantum computing. The maspar approach is very hard, but worthwhile hacks can be sold to hypercorps and others for a tidy profit - there is always a demand for better ego emulators. Most overclockers have long since given up on getting much from maspar.

The third and most dangerous approach is to reduce the computational complexity of the ego. The more radically the ego can be pruned the faster it becomes. As the overclocker joke goes, "an erased mind runs infinitely fast". Neural pruning can be used to optimize for speed, both by removing unnecessary neural network computations and by reducing the number of slow long-range signals. Truly radical optimization is more akin to creating a delta fork: the original mind is mapped onto a speed-optimized AGI architecture. Some overclockers find it worthwhile to make this "hyperspace transition".

We are on the extreme promontory of the centuries! What is the use of looking behind at the moment when we must open the mysterious shutters of the impossible? Time and Space died yesterday. We are already living in the absolute, since we have already created eternal, omnipresent speed.
– F. T. Marinetti, *The Futurist Manifesto*, 1909

Overclocker culture tends to form local clusters (since delays are so detestable). Within a cluster the overclockers exchange tips, have speed competitions and tinker with their software. They often network with other singularity seekers and hackers to uncover ways of getting around technological or legal limitations on their minds.

Before the Fall many military groups, megacorporations and research outfits experimented in pushing the speed of infomorphs. Much of this research has been lost (and is highly sought after by overclockers), but the basic conclusion was that pushing the speed of transhuman-derived egos had too strong diminishing returns - for super-speed AI would be the ideal choice. This most likely contributed to the development of the TITANs, casting further shadow over the whole subject.

Overclocking yourself

All I want to do is speed, speed.
- Miki Gorman

Beyond the obvious strategies of using simspace acceleration, narcoalgorithms, adrenal boosts, neurachem, and reflex boosters, most overclocking deals with overcoming the aptitude maximums of REF and SPD.

Tweaking computers to allow higher aptitude maximums requires Hardware Electronics Task Actions with a timeframe of a month. The difficulty is increased by a modifier equal to the current aptitude maximum. A successful result will increase the aptitude maximum by 1.

Hot core processor cluster

This is the real thing: super-fast processors. Some versions are literally hot and require major cooling, others merely employ devious quantum computations to improve performance. A hot core cluster allows SPD 5 and REF 50, as well as simspace speeds of 75 times realtime. The downside is that they are quite illegal, and for good reason: they are like milk and honey for exsurgent viruses and other nasty malware. [Cost: Expensive]

Cognitive preprocessing

An enhancement to the perception/action loops of an ego, speeding them up. The resulting mindstate has a considerably higher reactivity to the environment, often described as being jumpy or paranoid.

The enhancement is inserted using Psychosurgery. If it is successful it will give a +10 bonus to INIT. The SV is 1d10/2. Unfortunately it also adds a lasting derangement or a piece of neural damage. This enhancement can be stacked multiple times, but each extra preprocessor gives a -10 modifier to the psychosurgery task and the derangements will stack as per the mental trauma rules.

This form of enhancement was pursued by some of the Earth militaries a generation before the Fall, but were largely superseded by reflex boosters and other enhancements.

Neural speed optimization

This process is equivalent to neural pruning. An expert performs a Psychosurgery Test as per page 274, producing an optimized fork.

Mere optimization is akin to making a beta fork. It can increase REF by 1 point per aptitude reduced by 5 (or, alternatively, by reducing skills by 50 points or some other combination of changes freeing up 50 CP per extra point of REF). Note that INIT and LUC are recalculated. Optimized forks are not legally beta forks unless active skills are reduced below 60. Remapping is like creating a delta fork, with the same limits on active skills (40), knowledge skills (80) and psi. It allows the above trade of aptitudes for REF, but also gives +1 SPD and increases the aptitude maximum for REF by 5 regardless of morph due to the efficient implementation.

Temporal shear reduction software

*Here and there unhappy lamps in the windows taught us to despise our mathematical eyes.
"Smell," I exclaimed, "smell is good enough for wild beasts!"
- F. T. Marinetti, The Futurist Manifesto, 1909*

One problem for fast minds is dealing with slow minds, or worse, the physical world. TSRware is software run by the muse and morph that helps maintain function even when the ego is racing ahead.

Sensory TSRware handles the problem that eyes cannot saccade fast enough to take in a scene as the ego would like, and sounds are stretched out beyond recognition. The software creates sensory buffers that allow the ego to experience its senses fairly normally, despite them being software reconstructions of what is actually out there. It can replay the near past sensory experiences to give context. Motoric TSRware handles the problem of acting when the ego is ahead. It simply gives motor commands for what to do or say, and then the TSRware performs them without much need for oversight. This way a fast transhuman can appear to keep up a conversation: it is prompted now and then to listen to what has been said by the slow party, decides on a response, gets the TSRware to say it and returns to whatever they were actually doing.

TSRware requires a cyberbrain; implementing something in a biomorph would be exceedingly cumbersome.

Cost: Low

[Without TSRware, physically embodied transhumans will start getting -10 perceptual penalties at SPD 3 due to the sluggish sensory input. There is a -10 penalty for each further level of speed. Infomorphs dealing with the physical world have the same problem – usually their sensors are fine, but sounds are slowed down beyond recognition and motion can be hard to see. Similarly a fast transhuman suffers similar penalties for actions that have to be slowed down, such as talking to a biomorph or performing a slow dance – the individual motions can be done fine with some effort, but it is hard to maintain them in working memory while doing something else.]

Speedster morphs and bots

We declare that the splendor of the world has been enriched by a new beauty: the beauty of speed. A racing automobile with its bonnet adorned with great tubes like serpents with explosive breath ... a roaring motor car which seems to run on machine-gun fire, is more beautiful than the Victory of Samothrace. We want to sing the man at the wheel, the ideal axis of which crosses the earth, itself hurled along its orbit.

- F. T. Marinetti, *The Futurist Manifesto*, 1909

While not common, speed-enhanced morphs have been constructed. Most overclockers find them a waste of time or prefer to telecontrol very small robots.

One line was the pre-Fall **Amain** experimental biomorph of Noogenesis (now absorbed into Cognite). The Amain had a heavily modified biological brain supported by nanofibers and cooling, running faster than a normal biomorph. Unfortunately it was not worth the cost and the many medical problems, so these days Amain remains very rare collector's items. (Amain functioned as if it had Neurachem 1 active at all times, boosting into Neurachem 2 whenever suffering stress.)

Generally, it is hard to speed up physical movements for human-sized morphs. One approach is to have a very small morph. The **Exotech Mus morph** is the smallest morph around, its size mainly limited by energy and brain size. It is a scaled down version of the Arachnoid robotic shell. It is mouse-sized, very fast and looks like a six-limbed spider. To move it can run, fold up the legs and roll as a ball, or activate small turbofans to fly. It is officially intended as a repair shell for spacecraft and habitats, able to quickly fix things in a crisis. Unofficially it is an excellent espionage and sabotage shell.

Enhancements: Access Jacks, Basic Mesh Inserts, Cortical Stack, Cyberbrain, Enhanced vision, 360 degree vision, Extra Limbs (2 arms/legs), Nanoscopic vision, Mnemonic Augmentation, Reflex booster, Fractal Digits

Motility system: Walker (4/24), Roller (8/32), Thrust Vector (8/40)

Aptitude Maximum: 30 (10 for SOM due to size)

Durability: 25

Wound threshold: 5

Advantages: +5 INT, +10 REF (+20 with Reflex booster), SPD +1 (+2 with Reflex Booster), Small target (-20 to hit in combat), Armor 2/2 (4/4 when rolled up; in this state it can only roll as a physical action). Note that the small size makes falling relatively safe: it will reach terminal velocity after 2 meters, never taking more damage from a fall than 1d10 (and it will usually have the time to roll up). The small size also gives bonuses on hiding, freerunning and similar tasks.

CP Cost: 45

Credit cost: Expensive

The **Noaria Midge flier** is the smallest commercially available robot that can sustain telepresence. It is similar to a speck robot, a 0.3 mm flier not too different from a very fast midge. Like specks they are hard to notice (-30 perception modifier) and even harder to hit (-30 modifier to attacking, except from area attacks). Overclockers often arrange flight competitions with midgebots through microscopic obstacle courses or the back spaces of habitats.

Movement rate: 2/10, max velocity 10, armor: 6, durability: 40, wound threshold: 8, mobility: winged. Enhancements: +10 REF, -10 SOM, +1 SPD, Access jacks, grip pads, enhanced hearing, enhanced vision, nanoscopic vision, puppet sock.
Cost: Low

Exhuman: Simon Quong

In skating over thin ice our safety is our speed.
- Ralph Waldo Emerson

Simon was a young teenager when the Fall occurred; his adolescence was spent as an infomorph infugee in the servers of Dover Station (an infomorph/synthmorph Belt habitat). While at first concerned with the loss of his physical body he soon learned to enjoy the benefits of virtual existence. Running at simulspace speeds he grew up fast and now regards himself as a mature, middle-aged adult – insofar that even has a meaning any more.

Simon apprenticed himself to the local nanoprogrammers and electronics experts, helping them repair and upgrade mining ships and synthmorphs. He began to apply the upgrades to himself too, inventing a number of useful tricks for the mercurials on the station. Over the past few years he has become increasingly obsessed with speeding up thinking. A recent accident where the speed of him and his exceedingly fast forks saved the day has confirmed in his mind the need to be the fastest there is - if you can always outthink and outreact your enemy you will win.

Simon has never been particularly social, and as he has accelerated himself he has less and less patience with slow carbon and silicone piles. He prefers to associate with other fast minds, identifying more and more with AGI - especially the pre-Fall unlimited AGIs. He respects anything fast and smart, and is entirely open to plans for removing imposed limits on AGIs. To keep them slow and dumb is immoral. He is trading some of his "liberation services" in exchange for exotic blueprints and pre-Fall code he intends to use to improve his speed even further - soon he will be able to construct his "dream core".

Roleplaying tips: Simon is *fast* and has no patience or respect for anybody who is not also a quick infomorph. He is quick, impersonal and confusing like a virtual tornado, with a self-image just as mercurial and twisty. Unfortunately his sense of right and wrong is just as unstable: there are just problems to be solved as fast as possible. He is also extremely unphysical: he thinks and acts in terms of information, not bodily action. In a fight he will instantiate a large number of fast forks and then launch a barrage of Infosec attacks not just against his enemies but against their equipment and environment too, infiltrating it and turning it against them.

Background: Reinstantiated

Faction: Mercurial

Morph: Infomorph

Motivation: +Speed, +Hacking, -Technophobia

COG	COO	INT	REF	SAV	SOM	WIL
25	10	30(35)	40(50)	5	10	10
TT	LUC	IR	WT	DUR	DR	
4	20	40	0	0	0	
MOX	INIT		SPD	DB		
3	170(200)		4(5)	1		

(Numbers in parenthesis denote his fully accelerated state when running Klar and Kick)

Traits: Fast Learner, Situational Awareness, Addiction: Klar and Kick level 1, Edited memories, Mental disorder: ADHD, Neural damage: somatosensory agnosia (objects cannot be described or understood by touch, but must be examined visually), chorea (quasi-purposeful "dance-like" involuntary movements of his body)

Notable implants: Reflex booster

He regularly uses stimulant narcoalgorithms equivalent to Klar and Kick (the Kick algorithm has produced the characteristic jumpiness and shakiness in his body-image). He has also undergone three treatments for cognitive preprocessing, something that has further messed up his body image; often he just turns it off for long periods when working on mental tasks.

Simon runs on his own homebuilt hot core, allowing him and his forks to run faster than normal infomorphs (it can handle up to 10 forks). Physically the core is located in his home/workshop among his other electronics, a nondescript device connected to various cooling systems and high bandwidth fiber optics. This core is not known to the Dover inhabitants and is formally against the habitat rules, but they have come to trust Simon anyway - he is hardly the quirkiest person around, and he has saved lives. Should the core get shut down he will automatically reboot in some other mesh nodes, but he would lack the extra speed advantages.

Simon is usually assisted by two or three delta optimized forks. Beside being cut-down versions of Simon they all have the delusion that the original Simon *really* is an AGI - they try to convince him to "upgrade to his true nature". He knows they are wrong but thinks it is an amusing notion. Once he gets his dream core built he is going to be faster and smarter than all known AGIs...

COG	COO	INT	REF	SAV	SOM	WIL
20	5	30(35)	45(55)	1	5	5
TT	LUC	IR	WT	DUR	DR	
2	10	40	0	0	0	
MOX	INIT		SPD	DB		
0	180(210)		5	1		