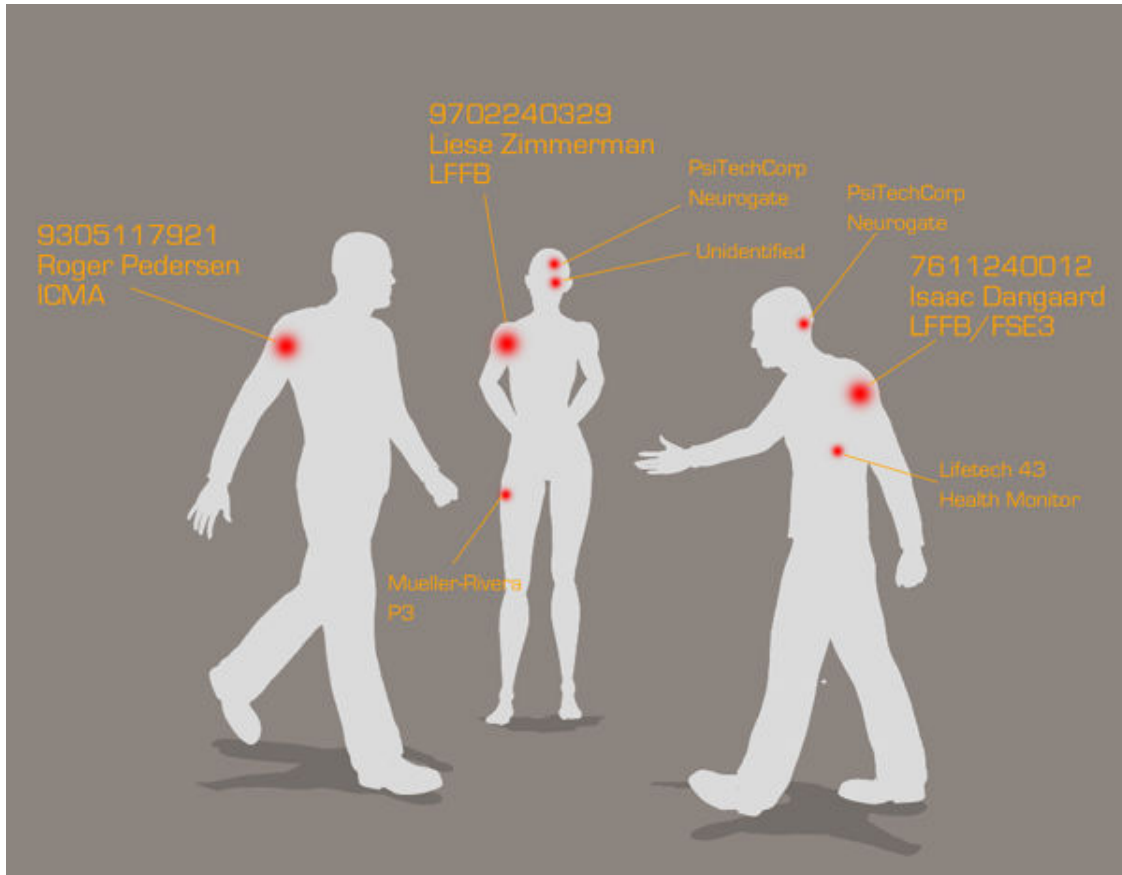# RFID Tags in 2320AD

RFID (Radio Frequency Identification) is ubiquitous in the Core. Tags mark everything from people to documents to individual bolts in a construction, and respond with a unique identity code when queried by a radio impulse.

Tags consist of an antenna that picks up queries and sends back responses, and a microchip that formulates the response. Active tags, powered by a battery or a tiny solar cell, are versatile and for all practical purposes indistinguishable from Link-enabled devices. Passive tags require a radio signal of enough power to drive the chip and send a response. This limits their range, but they will never run out of power.

Tags cannot be read through conductive materials, which mean that they do not work underwater, cannot be read from the outside when the wearer is inside a metal construction or close to much conductive material. "Faraday clothes" containing a metal mesh that interferes with RFID traffic exist (twice the price of normal clothing, usually less stylish).

Despite constant rumours that the police, military or Illuminati have satellites they can track everybody with, the range of a tag is less than a hundred meters for a normal personal tag and a strong reader. Some readers and tag have ranges on the order of kilometres, but they are uncommon. Many personal tags in the core have several ranges: a deliberate short-range identity

that can only be received within a few meters used for personal identification and a long-range identity for location or emergency use on the kilometre scale with high-power broadcasts.

In the core person tracking is more based on using a fine-grained network of transceivers that log when tags pass by. Most people are never more than a few hundred meters from a transceiver anyway. In an emergency it is relatively easy to follow the trace to the right location, and then use triangulation to find the tagged person. This is true even in the relative wilderness (where most roads and wandering paths tend to be covered anyway). Even if the person cannot be found directly he can be followed to the last known position and then the area not covered can be searched using drones with readers.

Military tags and many civilian models do not respond to just any signal, they are not "promiscuous". They will only respond to a correctly phrased and encrypted signal on the right frequency. This was learned early on, as terrorists linked readers to bombs to make the bombs selective for certain kinds of people or equipment. Encryption is also necessary in order to avoid spoofing, where another tag or device imitates the first one. However, limitations in onboard computing power and the eternal arms race between hackers and protectors means that there are sometimes ways of circumventing anti-spoofing measures.

The identity of a tag is fixed and cannot be changed unless the tag is replaced. Many tag models have some internal storage enabling them to store extra challenge-response patterns, which can be used for extra security, telling friend from foe and "leaving cookies", using the tag/person as a possibly unwitting courier for information.

A few cases of hacking using tags have occurred: an altered tag behaves like it ought to until a certain situation (e.g. when inside a secure location) when it embeds hacking software in its response. This requires fairly detailed knowledge of the reader system (or a very insecure reader system), but can enable very subtle hacking tricks like using unwitting personnel as Trojan horses.

There are rumours that some tags – especially implanted ones - act as recorders or other spy equipment quietly reporting back when they pass by a reader. This is likely untrue, since the sound reception of a tag in the body is bad. However, cases of bugged cybernetics have happened, and it is not inconceivable to have a tag that leeches power from a body area wireless network, storing eavesdropped data. Many secure installations are very careful to scan visitors for tags and equip them with a smart badge that acts as a limited RFID firewall.

Most implants have mandated tags, used to tell paramedics and autodocs what is present, warn against using certain techniques or give technical specs. Most people regard this as a good thing, since it reduces medical risks significantly. It also makes it possible to scan for a person's capabilities, but as this function is largely used by law enforcement most Core people find the privacy intrusion acceptable. However, black market implants tend to lack tags or use erroneous tags (i.e. a super-strong cyberarm is described as a prosthetic cyberarm, a pleasure chip is a Schizophrenia treatment etc).
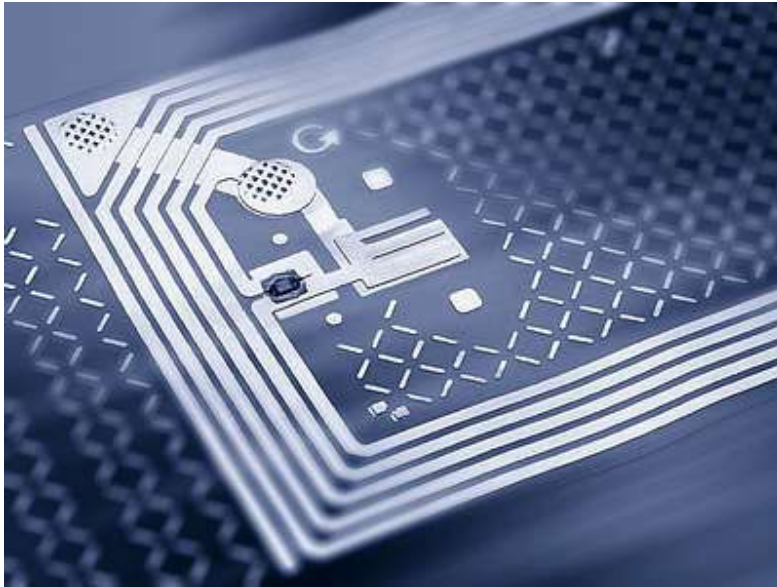
RFID Tape

Tags for home or office use. Comes in rolls of different sizes, colourings and adhesion properties. Widely used for marking possessions and locations or in games.
Price: Lv 1 for 100 tags.

RFID Reader

Most portacomps have a built-in rfid reader, but for long-range detection and triangulation a dedicated reader is useful. Note that tags will not necessarily respond if the right codes are not known.
Price: Lv 30

RFID firewalls

Some people like electronic privacy. The firewall is a device that is worn (or integrated into a portacomp) that intercedes when a read request arrives, log it, briefly jam the local tags so they do not respond, decide whether to let the request through the jamming and then retransmit it (possibly altered). This can enable both selective privacy and a way of noticing secret requests, but it tends to interfere with other people's tags nearby. Two people with firewalls in the same room tend to jam each other. Firewalls are restricted in most core nations. The range is about two meters.
Price: Lv 750
TL: 11

Rfid scanner

A device that is often combined with a firewall that sends out broad-spectrum radio signals, looking for resonances that betray tags. Even if the tag does not respond it can be detected through the resonance of its antenna.
Price: Lv 750
TL 10

Rfid burner

A device to fry tags in the vicinity. Essentially a tuneable radio generator it can either be set to a certain frequency where it releases a burst of radio waves to burn out tag chips, or be programmed to play across the spectrum. Illegal in most jurisdictions, except for stationary "microwave ovens" used to remove tags on goods. Some tags are "shielded" to prevent them from being easily fried. Tags intended for use near major electrical fields like starship drives tend to be shielded, as are involuntary tags.

When the burner is activated all tags within 10 meters take 1d6-1 damage. Non-hardened tags have just 1 hit point. Being inside a body or some protective conductive container gives 1 or 2 levels of armour.

Price: Lv 1000, "microwave oven" Lv 100.
TL: 11

Involuntary Tags

Normally tags are placed just under the skin and can be removed using local surgery, but involuntary tags tend to be placed somewhere where it is hard to get at them – inside the stomach cavity, sphenoid sinus, in cybernetic implants or even inside the cranium, bones or the thorax. Military tags are also often placed in such places to ensure that they are not removed. Some black clinic tags have been known to be booby-trapped in various ways to ensure that they are not removed.

Price: as ordinary tag, but 1d6 hours of surgery with a cost of Lv 200 per hour.